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**CONTEMPORARY EDUCATION
ITS PRINCIPLES AND PRACTICE**

CONTEMPORARY EDUCATION ITS PRINCIPLES AND PRACTICE

BY

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TO
MY ALMA MATER
THE COLLEGE OF THE CITY OF NEW YORK
THE EXPONENT OF
EQUALITY OF OPPORTUNITY
AND
DEMOCRACY IN EDUCATION

PREFACE

Orientation and survey courses in the sciences and in the social studies are now among the basic prescriptions in most recognized college curricula. They may be identified by such titles as "Contemporary Civilization," "The Nature of the Physical World," "Evolution of Modern Society," and "Fundamentals of Science." The recognition accorded them can be ascribed to neither accident nor fad, but rather to the unprecedented growth of the field of human knowledge.

Education is at best a secondary and derived study for it is conditioned by the findings of the biologist, the physiologist, and the psychologist. Its principles cannot be evolved or its practices formulated with any degree of accuracy without the sanction of the sciences concerned with body and mind. The study of education, then, resolves itself into a study of the basic tenets of sociology, economics, psychology, biology, and physiology. Its field is, therefore, coextensive with life.

The purpose of this book is to coördinate the accepted principles of social and psychological studies and to indicate their significance for education to-day. The study of contemporary education is set forth in five parts. After an introductory analysis of aims and objectives, the practices of physical education are presented. The succeeding parts deal with sociological, economic, and mental aspects in the process of adjustment. The lessons of physiology, mental hygiene, psychology, biology, sociology, and economics are integrated and unified in an attempt to formulate the principles of educational practice. The author hopes that this book will be found a helpful teaching instrument in the introductory or orientation courses in education, as well as in existing courses in principles of education. He has sought, at all times, to expound theory with adequate application to contemporary practices, and to present current practices against a background rich in psychological and biological theory. This book is, therefore,

designed to serve as a transition from educational doctrine to educational practice. It seeks also to evaluate contemporary practice in the light of those principles generally accepted as sound.

The author has further sought to present the study of education as an emerging body of principles and practices which must be modified and enriched in the light of revealing experiences and experimentally derived data. The discussions of traditional attitudes and values invariably point out the differences between logical inference and demonstrable fact, and emphasize the utter inadequacy of the former as sanction for educational procedures. In these indirect and incidental ways, the text strives to give the student an insight into scientific method, and to undermine the time-honored practice of settling educational differences by debating the relative merits of personal opinion.

At the end of the various chapters, the student will find selected bibliographies and suggested lines of inquiry and discussion. In formulating the reading lists, the aim was to present, not complete bibliography, but rather carefully selected readings, which would enrich the concepts here formulated and lead the student to challenge the point of view presented. The suggested questions and problems are designed to encourage students to react critically to the content studied and to crystallize the fruits of their own thought.

The author takes this opportunity to acknowledge his indebtedness to his colleagues for their invaluable aid in preparing his manuscript. They subjected the material to classroom test and reported the students' reactions. Much that is helpful in these pages must be ascribed to their keen and sympathetic criticisms of the author's earlier drafts. Expressions of gratitude are due especially to Prof. Joseph G. Cohen, Prof. A. J. Goldfarb, Prof. Egbert M. Turner, Prof. George M. Falion, and Dr. Harold Abelson. No word of mine can adequately convey my sense of gratitude for the encouragement, the sympathetic guidance, and the gracious help which I received from my wife,

P. K.

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PART I
THE MEANING AND FUNCTION OF
EDUCATION

CONTEMPORARY EDUCATION ITS PRINCIPLES AND PRACTICE

CHAPTER I

THE FUNCTION OF EDUCATION

Education from a National Standpoint.—In our political and social development two theories have commonly been propounded to explain and justify the existence of the state. These are extremes in aim and spirit and have given rise not only to limitless discussion among students of political science, but even to bloodshed among the classes constituting the state.

The Older Theory: The Individual for the State.—The first and the older of these two theories of the state holds that the individual exists for the state. The state is supreme. State preservation is the highest function of the individual, both as an individual and as a member of society. If the welfare of the state is threatened, personal pleasure and ambition, family ties, and even life and limb must be unhesitatingly sacrificed at the call of the ruler. Assyria, Egypt, India, Sparta, and Rome in ancient times, and Czaristic Russia and Prussian Germany in modern times are the classic examples of the political organization and the civilization which have been founded upon the complete subordination of the individual.

The More Modern Democratic Theory: The State for the Individual.—The more modern conception maintains that the state exists for the welfare of its members. The highest duty of the state is therefore to promote the well-being of its constituent individuals. Their rights are supreme; their will, the ruling force; and their needs, the ultimate aim—they are the state. This theory holds that all individuals ceded certain rights to a central body, the state, for their own better pro-

tection. They created the state, they can reshape and even recreate it if their happiness cannot be secured without this radical change. This conception of the state shows appreciation of the true worth of man—it is an apotheosis of the individual. This doctrine is responsible for the separation of church and state, the death of the divine right of kings, and the rise and development of democratic government. In the sixteenth and seventeenth centuries it secured religious freedom; in the eighteenth and the nineteenth, political freedom. Our economic soothsayers predict industrial freedom as its result in the twentieth.

Conclusion for Education.—Opposite as these two conceptions are, they nevertheless lead to a common conclusion when viewed from an educational standpoint. If the state is supreme and its welfare is the center about which individual life must revolve, then its growth and power depend upon the moral strength and intellectual enlightenment of its members.

Germany of 1914 illustrates the monarchical state that saw this fundamental principle very clearly. She developed a system of education that was all inclusive; she trained every member of every caste to become an efficient instrument of the imperial will. She developed a program of social legislation—industrial insurance, protection against unemployment, old age safeguards—that won admiration in many enlightened quarters. Monarchical Russia, on the other hand, was an example of a state that blindly followed the belief that in the perpetuation of the ignorance and the helplessness of the masses lay her permanence. In the time of stress of the World War, Russia soon cracked under the strain but Germany successfully withstood, for many years, the united pressure of the world.

In the final analysis the state is no stronger than its representative citizen; like a chain, it is only as strong as its weakest constituent link. The better the development of its component individuals, the stronger must the state, as a whole, be. The immediate safety and the ultimate permanence of the state lie in the education and in the growth of its members.

If, on the contrary, the state exists for its individuals, the

very best protection that it can give to them is to help them realize, to the very full, their own native powers and to teach them to use, to the utmost, their own strength and their own resources.

We know, full well, that we are destined to a life of social interdependence and mutual help. True social efficiency can be attained only when each individual is prepared to contribute his best endowments to society and to enjoy the advantages which society has to offer him. This process of self-realization through social life is the highest result of the educative process. From the educational standpoint, both theories seem to teach the same lesson—*Education is the greatest function and the final safeguard of society and its organized form, the state.*

What Kind of Education Should Society Give?—Admitting this broad and theoretical conclusion, we come to a consideration of the kind of education that society must give. Before attempting to formulate an educational program, we must analyze very carefully the nature of the individual whom society is to educate. All human conduct is the outward expression of inner promptings; it is the resultant of conflicting impulses, both inherent and acquired. If we turn the searchlight upon our inner motives, we find that each of us is the slave of two potent groups of tendencies, all-powerful and all-controlling.

Conduct in Terms of Individuating and Socializing Nature.
—It seems as if there were two conflicting selves that constitute each human. The first is the *individuating nature* that impels man to be himself, to differ from others, to excel, to stand above and apart, to lead. The true teacher, the reformer, the inventor, the social or the religious leader—these are people with strong individuating natures. They assert themselves, strive to set up new forms of civilization and new standards of right and wrong, because existing conditions of life, however satisfactory to others, offend them. They are the prime factors in the movement for progress; they are the moral forces that lift mankind to higher and nobler destinies.

But let us note the implication; how can we excel or lead

others unless we live with them? The individuating nature, in trying to assert itself, must give way, partially, to a second and almost opposite impulse, the *socializing nature*. We suppress our individuating natures to an extent that makes us not unwelcome, at least, in the society of our fellow-men. We find unmistakable pleasure in being in the company of others. This social nature not only makes communal life possible but encourages us to follow as well as to lead, to remain partially content with existing conditions, and to live within the standards and customs of the community.

Each person is, hence, a duality, a composite of two contending forces, one striving toward individualization and the other toward socialization. Should society, in its education, suppress or even discourage the individuating nature? Evidently not, for then all initiative, all invention, all improvement, all progress would be stifled. Stagnation and decay would be the inevitable results. Should society, on the contrary, then give to the individuating nature unlimited sway and allow it to express all its inherent promptings? This may be an attractive ideal to some, but it can lead only to an exaggerated ego, to selfishness; it puts a premium on domination; it unsocializes the individual and makes organization impossible. Individuality is a blessing indeed. But excessive individuality may be as bad as too little; it is too often a factor making for antisocial personality.

Conclusion for Education.—The question is not, therefore, which of these two natures shall we develop and which, neglect. Both are inherent; both make up the sum total of man; both help to establish the balance which spells social safety. The problem is, rather, in what proportional relations shall we develop these two natures so that man may live in harmony with himself and the rest of mankind. The best possible education, from the point of view of society, emphasizes both the individuating and the socializing nature. *That education, then, is best which gives the individual the freest possible development consistent with social welfare.*

We must define more clearly two elements in the conclusion just formulated—*freest development* and its limiting condi-

tion, *consistent with social welfare*. Modern society must guarantee to each individual, opportunities for the full expression and the complete realization of his desires and his capacities. It must respect the desires of those who wish to become "*the idle singers of an empty day*" as much as it does the intentions of their more commonplace brothers to become simple craftsmen. Society must not interfere unless the individual undertakes activities which seek its own destruction, or, which outrage the prevailing sense of morality, or, which make the community bear the burden of permanently supporting him. Obviously, society cannot tolerate either idleness or the stubborn pursuit of those activities for which an individual has no capacities. Destroy the state, in our modern civilization, and you destroy all guarantees of liberty and life. Clearly, self-preservation is the first law of the state as well as of the individual. The community has established standards of conduct which—right or wrong—it will not permit any one to violate. Hard, indeed, is the path of the transgressor.

How Can This Ideal Be Realized?—We have accepted an ideal in education; an ideal both broad and liberal. The very vital problem that confronts the teacher is how to shape classroom activities so that they translate this ideal into reality. Let us consider the solutions offered by the great figures in the history of education.

1. *Education as Harmonious Development*.—Many believe that education can realize this goal if it will seek to give each individual a "harmonious development of all his powers and capabilities." For a long time this definition of education held sway. It taught that education was the process that sought the harmonious development of the individual. This is the ideal, commonly identified as Greek, that many would eagerly set up to-day as a modern desideratum. This was the educational dream of Plato and his followers. Centuries later, it became the educational hope of Pestalozzi. Will such a conception of education lead to a realization of our ideal? Let us see.

What is the whole scope of the educative process, according

to this conception? The individual. An education that sees no further than the individual, whose field of operation does not transcend the individual, is narrow. In the final analysis we are social beings and must be prepared for life in society. Our highest development is attained only through life and contact with others. All individuals are social individuals, and all society grouped individuals. Education that seeks only the harmonious development of each individual's powers does not point sufficiently to a training that will fit man for his life with other men.

Then, too, why develop man's powers at all? Why consider them an asset in life? For the same reason that everything else that is valuable is so considered—for its usefulness. A picture is valued because of its use; it gives pleasure which the æsthetic nature craves. A commodity or power is appreciated and wanted merely because it is usable. Utility is the keynote of value. Does this conception of education suggest the use to which these powers will be put in society? It merely sets up as the goal of its endeavors the attainment of harmoniously developed powers and capabilities. Before we develop powers, we must decide on their use; otherwise we are developing powers for their own sake. We must remember that in the economy of human life, "Aside from its function, a power has no value."

To the two limitations that were noted above, we must add that it is an error to presuppose that we need a harmonious development of all our mental and physical endowments. No graver error is ever made than to labor under the belief that nature intended us to be equal. "We are born equal" is a catch phrase, both empty and erroneous. We are creatures of varying degrees of ability. We have capabilities which fit us for one activity rather than for another. Nature shows a most decided and positive preference for differentiation. Our varying degrees of endowment show clearly that each of us has a special message to deliver and a special mission to fulfil for society. Education must take cognizance of this primary law and give each individual a training in harmony with his natural gifts, but not a training

that seeks the harmonious development of all his powers and capabilities. The person artistically gifted must be developed along artistic lines, the intellectually favored must be educated accordingly. To give a harmonious development of all capabilities would neglect distinctive forms of intelligence and develop each as much along his weakness as his strength.

Psychologists regard intelligence as a general ability to profit from experience. But they distinguish different forms of intelligence that are not always found in the same degree in each individual. Thus social intelligence, ability to make man-to-man adjustments in society, is held to be a form of intelligence different from mechanical intelligence or linguistic intelligence or manual intelligence or æsthetic intelligence. We have reason to believe that certain students who exhibit marked proficiency in mathematics, in physical science, and in social studies, may not be able to do manual work of more than average merit, and may achieve decidedly inferior results in the honest performance of drawing or music assignments. Shall education spend equal time and effort on all phases of intelligence in developing an individual? What will society realize on such an investment?

As a final point in our estimate of this conception of education, we must note how impossible it would be to ascertain when an individual has been developed harmoniously. What is harmonious development for one is not harmonious development for another. This standard is vague and impractical; its scope is limited and inefficient; it surely will not enable us to achieve our guiding ideal. To develop all powers harmoniously does not give the freest expression of individuality consistent with social welfare, for such an education would deliberately discourage and even suppress what may be most distinctive in the life of an individual. Let us turn to a second theory of education.

2. *Education and Spiritual Inheritance.*—The function of education has been defined as the “acquisition of the spiritual inheritance of the race.” The followers of this standard of education set up culture as their goal, “Knowledge for its own sake” as the *summum bonum* for all educational endeavor.

All that the race in its history has accumulated in the fields of science and art becomes the heritage which education holds in trust for each succeeding generation. Does this conception bring us nearer to our ideal?

This interpretation of education lays too much stress on the acquisition of facts. Education is not an absorbing process. It is rather an unfolding of powers and capacities already present in the child. The individual gains strength and mental power only as the capabilities of his mind are used for necessary ends. This "acquisition aim" of education fails to realize that what is vital in education is not the imparting of facts but rather the development of power to find one's own knowledge. It is hence a static conception of education.

Then, too, the followers of the theory of "spiritual racial inheritance" rely too much upon the dead past. Living beings look to the future, which throbs with life and hope. Our goals lie before, not behind us. Education must do more than make us relive the life that was. Acquiring what the race has experienced in the past is no adequate preparation for one's participation in the living present and future.

There is no doubt that the past is necessary for present and future life. But we need only that in the past that serves to explain our present and to foreshadow the probable future. We disapprove of education formulated in terms of the "spiritual inheritance of the race" because it gives no assurance of the fullest expression of individuality consonant with social well-being.

3. *Education as Economic Preparation.*—*Educate to make a living*, for education is a bread-and-butter affair, is the controlling principle which has often determined the character of the training given to youth. With the enthusiastic recognition of the claims of vocational training, this economic conception of education is gaining currency. Although not frequently expressed in such bald terms, this interpretation of education is, nevertheless, permitted to shape courses of study and standards of classroom achievement.

Strength of the economic conception of education. This vocational aim of education is usually condemned because

of its crassly utilitarian implications. It seems so arrogantly materialistic that one feels impelled to turn from it. Much, however, may be said for it.

To begin with, it is definite. One knows how to evaluate teaching, teachers, and courses of study. The degree to which they contribute towards the economic adjustment, which every child must ultimately make, measures their worth as educative agents.

This bread-and-butter conception of education rests, in the technical economic sense, on firm ground. It assures society, workers trained for their tasks and guarantees to each individual a preparation for his life work. So important is this vocational training that we shall devote an entire division of this book to this phase of education.

The vocational justification of education supplies a definite standard in terms of which one may determine the subjects that shall constitute the prescribed course of study. Shall the geography of Asia be taught to twelve-year-old pupils? Shall world history be made part of the history course? Shall civics be given, as is common in current practice, only one-fifth the time allotted to history? Shall algebra and geometry be prescribed for all high-school students? Shall all college students be required to study descriptive geometry and calculus? If we attempt to decide these questions on the basis of the educational values of the subject matter under discussion, we shall find it impossible to exclude any branch of human experience. A telling case can be made out for any subject. An unusually strong brief can be submitted for the prescription of a course in the solution of cross-word puzzles. Apply the standard—does it contribute directly to the preparation for a vocation—and at once certain subjects must be retained and others transferred to the list of elective studies.

Few conceptions of education supply the pupils with a stronger motive for learning than does this economic aim. The pupil realizes the definite part that arithmetic or commercial geography or composition will play in his chosen calling. Time and energy exacted by these subjects now seem justified. The student in normal schools often gives himself

grudgingly to his history of education but cheerfully resigns himself to the demands of the teacher of psychology or classroom discipline because the latter subjects have direct and immediate application in his chosen vocation.

Limitations of the economic conception of education. The inherent weakness of this conception of education lies in its narrowness. It is so completely occupied with training to make a living that it forgets to teach the pupil how to live. Life that consists solely of making a living is not worth living. Shut out social relationships, music, graphic arts, the theater, and physical recreation and what is left? These occasional high moments of social and emotional satisfaction render the business of making a living really worth while.

The economic aim of education will not bring us to the ideal that we posited earlier in our discussion. It may lead, for most pupils, to the ruthless neglect of many legitimate cravings that cannot be satisfied by vocational training. It is an aim that must be recognized, that must form part of the complete conception of education but it must not be permitted to occupy a place greater than vocations do in life itself.

4. *Education and Habit Inculcation.*—Some educators conceive education as the process which inculcates in an individual such habits of thought and of action as will fit him for his physical and social environment.

The superiority of this conception of education over those that we have just presented is unquestionable. It looks to the future, it seeks action rather than mere knowledge, it strives to prepare the individual for his proper reactions in society. This conception of education makes for the greatest possible economy in mental and physical life. By making all essential reactions automatic, the individual is rendered self-acting in all vital adjustments. Proper conduct is guaranteed through force of habit.

Habit as an end in education is now commonly recognized. In physical education the acquisition of the facts of hygiene is completely subordinated to the daily health inspection and the establishment of a routine of living that makes for health.

In character training we no longer sound the warning of "don'ts" but establish a set of activities and encourage such extensive pupil participation as will inculcate habits of correct behavior. In standardized tests, we strive to measure, not the facts that the child may happen to remember, but habits of accuracy and speed in arithmetic, habits of correct speech in oral and written composition, habits of drawing inferences in geography or history. In the various parts of a modern test—true-false, completion, and multiple-choice statements—the aim is to ascertain the ready reactions and the habitual responses of the pupils. Habits, the permanent results of learning, are now made the measure of the quality of classroom instruction.

But may we not question the desirability of habit as the final stage of human development? The supreme force in human life is reason, not habit. The highest form of character development is found in the individual who is self-controlling and self-directing. Would not this conception of education in terms of habit make life too routine? To habituate life to the extent that is advocated might make us all slaves of our yesterday's selves. Our ideal seeks to give the fullest possible development of the individual consistent with social welfare. To reduce life to the plane of habit may mean curbing and repressing the freest expression of the individual.

5. *Education as Complete Socialization.*—Society establishes for us, through conviction or compulsion, our final aims of life. It formulates the standards that shape our conduct in all relations. Any act we perform or any choice we make is dictated to us by society. Nor is thinking any more free from social domination. We think and usually make final judgments in accordance with the patterns society approves. What decision has the reader ever made that did not have its origin in social conditions and that was not shaped with reference to its social acceptance? Mind, then, is nothing more than a social function. *The aim of education must be to socialize man completely—to make him socially efficient.*

We must not erroneously assume that training for social

living and training for citizenship are synonymous. As a member of society, the individual has more duties than the mere political ones. We must insist that his membership in his family, in his club, in his trade, and in his church is just as important. The school must reflect all these phases of life. It must teach him the common vocations in society, so that he may find his place in our present industrial organization. It must seek to develop leadership in him, for our democracy depends upon the people for its leaders. Training for mere citizenship is not enough; the school must train for complete social life. To quote Dewey, "Apart from the thought of participation in actual social life the school has no other end or aim."

Nor must we assume that education for social efficiency, for complete socialization, implies the repression of personality. That was the error made in older society that failed to realize that no genuine socialization can follow the repression of individuality. The ruling castes of India and of Egypt and the leaders of ancient Rome undoubtedly boasted of a system of government which made for social efficiency. But to them, social efficiency was a condition of social likeness wherein each recognized his status in life and adjusted himself to it with complete and cheerful resignation. Education was deliberately made the process that casts the individual in the commonly accepted mold.

Our modern conception of social efficiency is diametrically opposed to its crude forerunner. We hold that only as each individual's differences are recognized and as his gifts are developed are we making for social efficiency. Only as we adjust education to the degree of capability and the character of the intelligence of an individual are we making him socially efficient. Our first business in education is to differentiate pupils; to set off those who have exceptional power from those who are fairly capable and both of these from the mediocre and the inferior-minded. Our first task is not yet complete. We must discover those who are specially endowed with distinctive manual, intellectual, linguistic, or æsthetic gifts. Then are we ready to plan the education of the different groups

with the hope of approximating social efficiency. Only as we differentiate education and develop individuals differently, do we enable them to attain their true place in life. Society receives from them the best they have to offer. And more, they cheerfully give their best because they experience genuine satisfaction in expressing themselves. The mechanical-minded person enjoys his work if it requires the exercise of his mechanical intelligence. So, too, those of intellectual or linguistic or æsthetic power find real satisfaction in the work which evokes their respective abilities because they, too, are thus enabled to express themselves. Social efficiency depends on our ability to discover differences and educate differently. The more uniform the educational process the less efficient socially will individuals become.

How Shall the School Socialize the Individual?—The school can do much to socialize the individual through (a) its regimen of discipline, (b) a wise curriculum, and (c) a system of rational methods of teaching.

(a). *School discipline as a socialization process.* Principal and teachers formulate a variety of regulations dealing with orderliness in dismissals, conduct during fire drills, punctuality, neatness, care of school property—rules to make life safe and work possible. Strict adherence to these school laws is demanded in the hope that constant repetition will make correct conduct habitual. The children obey, not because they understand the need for the regulation, but because of fear.

What large school does not insist that children leave the gate immediately upon dismissal? No loitering at the exits is permitted. Ask children, "Why must you walk away from the exit?" and you will elicit the prompt reply, "Because you get punished if you don't." Persist with, "But why are you punished for waiting at the exit for a friend?" When comparatively few children can answer the question intelligently, the character of the discipline is under serious indictment. The writer has often asked fifth-grade pupils, "Would you be permitted to congregate at the exit if there were only six pupils in each class in this building?" and obtained prompt

assurance that the rule would be observed just as rigorously by their competent principal and his corps of monitors. The class was surprised to learn that under those supposititious circumstances, no such regulations would be made. Questions elicited the fact that about three hundred children use the same exit; that if those who leave first remain at the gate, they choke the exit; that those who follow are seriously delayed; that in case of fire, waiting for friends at the exit might cause loss of life to those who could not get out. Now the children saw clearly that they, the school population, not the arbitrary minded principal, made the rule necessary.

It is interesting to ascertain from children what reasons the school has for assigning certain stairways to designated groups of classes, for insisting that they refrain from whispering when the spirit moves them, for getting to school no later than 8.50, for bringing to class more than one sharpened pencil, for keeping to the right wall of the hallways in changing from room to room—the host of usual prescriptions. Their ignorance of the social reason for these regulations is appalling. They obey them blindly. But blind obedience to a set of arbitrary rules will not develop power of self-direction. Just as every law in society, theoretically at least, has its origin in social protection, so too every school regulation must be explained as an outgrowth of a social need.

Significant disciplinary controls accrue from encouraging pupils to participate in the government of class and school. It is well to let those who are to obey the laws, help to make them. Pupil self-government schemes and coöperative projects like service leagues, play their part in giving the child a richer understanding of the laws he is expected to respect. To-day, too many children are likely to regard school law as instruments deliberately designed to shut in their lives and to make living hard. Small wonder that we find so much deliberate disobedience. And smaller wonder that school discipline fails to develop habits of socialized conduct.

(b). *The curriculum as a socializing process.* Too often, children see as little social justification in the subject matter we teach as in the regulations we impose upon them. Expe-

rience that is worthy of a place in the curriculum should give an understanding of society and the most significant relations involved in living together.

How frequently do we find teachers who think they have successfully completed lessons in geography when their pupils recite glibly, "A mountain is a high elevation of land," or, "A cape is land projecting into the water." What if a cape is land projecting into the water? The teacher is not moved by this characteristic of coastal land and the children are even less concerned. Why do we teach these fundamental concepts of geography? What would happen if children demanded, as is their undoubted right, that we justify the imposition of these definitions in geography? We would have no answer for them unless we were prepared to take these geographic facts out of the realm of stray information, and give them rich social significance. Lead the pupil to understand that in our present stage of development a cape is socially very important; it is one of the greatest danger points in commerce; the mariner and the foreign trader are highly interested in these projections of land. Capes break the coastline, make harbors, produce shipping facilities, and thus give opportunity for intercourse between nations. The continent with the least number of capes, Africa, the Dark Continent, is the least civilized; the one with the greatest number, Europe, has long been the center of intellectual life. We are interested in capes because they have significance for human life. When aërial navigation is developed to the same point that we have reached in water transportation, we shall emphasize, in our geographical teaching, not capes, but plateaus, for these may be the great harbors for the future winged ships. Present social need dictates that we teach capes today; social need of the future may direct that we stress the plateau. For similar social reasons we are interested in mountains, rivers, islands, peninsulas, all the important geographical land-and-water forms. Their real significance is not physical but social.

The old view of geography as the study of the size, shape, and surface of the earth is rapidly giving way to the new

conception of geography as the study of *the earth as the home of man*. The chief concern of the new geography is to help the child understand how "earth forces" are shaping life. We no longer drill on the capital of each state in the union; on the location of numberless islands, mountain peaks, and lakes; on lists of products, exports, and imports. In modern geography emphasis is placed on resources; on the forces that determine the products of different nations; on the movements of products; on commercial routes and their great terminals—the modern cities; on trade rivalry; in short, on those skeins that must be woven into the fabric which will serve every intelligent citizen as a background for the social and economic problems that will confront him.

The same thought applies to the teaching of history. If the topic is "Plymouth Colony," great stress is too often laid upon the fact that one hundred five souls came, that a child was born during the voyage, that the Pilgrims landed at Plymouth Rock, and similar facts. What if one hundred five or one hundred twenty-five souls came? What if they landed on the rock or on a sandbar? In either event our national history would have been the same. The point to make vital in teaching "Plymouth Colony" is that, before landing, the colonists drew up a compact which provided for democratic rule and for election of officers. Here we see the seeds of modern democracy planted in the new world. Those facts that help to explain present social organization are of prime importance; the others are decidedly secondary. The business of history is to give a sympathetic insight into the present.

This principle of selecting subject matter in history and geography must prevail in all other subjects. What shall we teach in arithmetic? in grammar? To what extent shall we emphasize hygiene? The answer is invariable—teach that which explains our way of living; give emphasis to subject matter according to its rôle in the everyday life of the pupil. The student is urged to make a few comparative studies of curriculum materials of 1890 with those of our day: scrutinize the lists in old spellers and those of the present; note

the examples in permutations, in true and false discount, in mensuration of the old textbooks, and see how far we have left these grotesque queries behind; contrast the inane repetitions that made up a page of the old primers with the living reading material we give our children. These instances give evidence of our attempt to relate education to the life the child must live. In the last analysis, the actual life of the pupil is the ideal curriculum. This is no new idea in education. It was vividly suggested by Rousseau.

(c). *Methods of teaching as socializing processes.* The teachers of the past were so completely taken with the task of preparing their pupils for adult life that they denied them the opportunity to live. Artificial subject matter was forced upon reluctant minds because of its preparatory value. Long lists of names, dates, places, and events were assigned in history and geography, not because the facts played a serious rôle in life, but because they would train the pupil to face cold and disagreeable reality. Pupils learned many rules in grammar and as many exceptions to each rule. True, the pupils soon forget the rules, and rules, however well learned in isolation, are usually not spontaneously applied in written or spoken speech, but the futile grind was continued.

Education, to-day, is coming to be regarded as a participation in life, rather than a preparation for living. The second-grade child who learns to spell by unrelenting repetition is preparing for a possible future need in life; his more fortunate friend who learns the spelling of these words by labeling articles in the classroom is participating in life. Analyze certain children's games and note the complex coördinations and the number of events that must be remembered. Yet how quickly do they acquire the technique of the games and how slowly do they learn the comparatively few items of the multiplication table. The reason is not difficult. Real education results from meeting the challenge of a well planned series of problems taken from life. The pupil who serves as clerk behind the classroom stationery counter learns more addition and subtraction in one period than in a half dozen drill lessons designed to prepare him to meet life's future

demands in arithmetic. Our later discussion of problem and project teaching will give further elaboration of the principle that the best preparation for life is an active, intelligent participation in life's routine.

Summary of Education as a Socializing Process.—The strength of the modern conception of education for social efficiency lies in its eclectic character. It includes vocational education, habit inculcation, mastery of the necessary past, and, in a measure, harmonious development. Other demands are often made on education: that it develop character, that it train the mind, and that it produce good citizenship. These are met in our conception of education as a process that completely socializes the individual.

What in Modern Education Strives to Achieve Free Expression of Individuality?—Much that has occupied the foreground of the stage in contemporary education gives evidence that the school is seeking to develop the individual with full recognition of his weaknesses and his strength. The junior high school with its plan of discovering aptitudes, the various methods like the Dalton Plan to individualize instruction, the standard tests that seek to give impersonal measures of pupil achievement, intelligence tests that strive to measure the capacity of each pupil to learn, the scientific classification of pupils—all these give evidence that current education is in revolt against any system which does not assure each child an opportunity to express, in some measure at least, his true personality. In later discussions, we shall treat these movements in contemporary education in greater detail. We shall do no more at this time than list them as possible harbingers of more liberal public education.

Education as Adjustment to Environment.—Education for complete socialization is often defined in terms of adjustment. This new definition gives us no new concept but merely summarizes, in convenient form, what we have just accepted. Let us analyze the formulation of education as a process of adjustment.

The Phases of the Environment.—The individual's environment presents certain primary demands upon him which neces-

sitate the simplest form of physical activity. Walking, running, lifting, pulling, breaking, are a few of a host of actions that the individual must perform in order to obtain his food and satisfy those wants whose gratification preserves and sustains life. These physical activities, simple though they may appear because of usage and repetition, present numerous problems upon closer application. In all of them the individual is continually called upon to make a choice, to judge, to compare, to reason, to discover the mode of adjustment that will enable him to realize the desired result at the least expenditure of energy. The explanation of this close interdependence of physical and mental activities is apparent. Man always seeks the short course to his goal because his energies are limited. His wants, however, are infinite. If he is economical in the use of his powers, he can satisfy a greater number of wants; he has a larger surplus of vitality; after the mere physical needs are answered he can minister to mental and spiritual cravings. The whole scope and horizon of life are broadened. But, if human wants are not satisfied with great economy of effort, man is in danger of finding himself poverty-stricken in energy, bankrupt in vitality, with everpressing needs of real life constantly demanding satisfaction. It seems reasonable to infer that nature has wrapped with every physical act a host of intellectual concomitants, so that every movement may intelligently conserve his limited energy.

But man does not live his life and satisfy his wants by himself. By nature he is gregarious, social. He can achieve his highest development only in the society of others. This social aspect puts a new phase upon existence. There are rights and privileges of others that must be respected.

Education as Adjustment to the Environment.—Education, then, is that process that seeks to adjust the individual to his physical, mental, and social environment. Unless the individual can properly adapt himself to all his surroundings, he will find that maladjustment means a life of friction and combat, if life at all. Social effectiveness is determined by the degree of successful adjustment to the complete environment.

The Technical Meaning of the Term, Adjustment.—Severe criticism has been directed against the conception of education as an adjustment process. It has been urged that no more socially static aim of education was ever conceived; that adjustment implies the repression of all that is personal and individual in the endeavor to make one's self fit the environment. Such criticism assumes that educators regard the environment as a thing preordained, immutable for all time, and that they believe the individual must constantly stifle disagreement between himself and his environment.

No such implication is intended. Adjustment to the environment can be achieved in two ways. First, by changing the environment to conform to one's intelligently devised plan; second, by changing one's desires to conform to the conditions of the environment. Education counsels that each individual hold tenaciously to his legitimate desires and that he earnestly seek to change the environment. We are taught to measure progress by the extent to which we succeed in modifying our environment. The food and shelter provided by nature we now regard as inadequate. We build new homes of the materials provided by the environment and modify the foods through fire so that they serve our nutritional needs the better. All that we can learn by observing nature is too limited to satisfy human minds. We therefore harness nature's forces and through experimentation wrest from her, secrets she is reluctant to yield. The ideas and ideals of our immediate associates may be in sharp disagreement with our own. Our first impulse is not to change our convictions but rather those held by others. Only when nature's forces threaten to overwhelm us do we change our mode of life to conform to them. Similarly, we forsake our opinions only when reason demands or circumstances counsel. Far from being the passive victim, man is the active agent in his environment.

We have just drawn a sharp and distinguishing line between animal and human life. The animal is born into an environment which completely dominates it. Man, on the contrary, is endowed with intelligence which imposes upon him the task of mastering his environment and leaving it to each succeed-

ing generation a thing more man-made. The animal must submit to its environment or face extinction; man is doomed to extinction unless he dominates his environment. The conception of education as a process of adjustment is, therefore, truly dynamic and progressive.

Education and Its Changing Ideals.—Education has often been arraigned because it frequently changes its aims and practices. But if we regard education as the total forces that make for effective adjustment of the individual to his environment, then it must of necessity rigorously avoid a fixed ideal and formal practices. It must change, and change frequently, to keep abreast of the progressive movement of life. The environment is moving upward and onward; it is never static; it is becoming more dynamic. If education is to be efficient, if it is to adjust man to his everchanging and evergrowing environment, it must change and grow accordingly. As life becomes more complex, adds new wants, and turns former luxuries into present necessities, education must keep changing its scope and its functions. Education which is not constantly undergoing change, is static; it fits for life that was, not for the actual living present.

The Agents in Education.—Various enumerations have been made of the agents which educate human beings. The usual classification includes home, church, state, and vocation as well as the school. To deny that the first four of these institutions have far-reaching influences in the life of every individual is to deny truth itself. We must insist that this listing of the agents of education is seriously incomplete. Why omit recreational activities, the newspaper, the library, the art gallery, the theater, the music we hear, the round of experiences that make up each day? Surely these give color to life, and stir new purposes in each of us. Every agent in life is an agent in education. The very process of living is constantly and intensely educative.

Further Development of Our Study.—Throughout the book, education will be regarded as a process that is to make us socially effective by teaching us modes of making superior adjustments to all aspects of our environment. We shall

study the environment in its four phases, the physical, the social, the economic, and the mental. The succeeding sections of our study will therefore be the following:

- Education as Physical Adjustment
- Education as Social Adjustment
- Education as Economic Adjustment
- Education as Mental Adjustment

Under these four main themes we shall attempt to summarize the important forces that teach us how to make most effectively the vital adjustments of life.

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QUESTIONS FOR DISCUSSION

1. What was Hobbes's explanation of the state? Locke's? Rousseau's? How would you harmonize these three theories of state with the two presented in the text?

2. Is the educational implication of the three theories of state presented by Hobbes, Locke, and Rousseau the same as that of the two theories explained in the introductory pages of this chapter?

3. Make a list of twelve human cravings, for example, hunger, sex, self-expression, etc. Classify them under individualizing or socializing nature. Which of these cravings may be classed under either heading, depending on circumstances?

4. List five or six names of men and women who possessed dominating individuating natures? What evidence of this individuating nature did they give?

5. What system of education, commonly studied in the history of education, stressed the individuating nature? the socializing nature?

6. Which of the following nations or peoples developed an educational system that sought or seeks the fullest expression of individuality consistent with social needs: ancient Jews, Egyptians, Spartans, Athenians, Rome, Early Christians, pre-war Germany, England, the United States?

7. Consider these as exclusive aims of education,—harmonious development, acquisition of knowledge, vocational training, character development, development of the mind. Show what influence each of these aims would have on (a) the content of the curriculum; (b) the methods of teaching; (c) the character of the discipline.

8. Give instances from your own experience of practices in teaching and in disciplining which fail to socialize the child.

9. Explain, "The social origin and the social need of all school regulation." Can this advice be followed without exception? Name an exception. What school circumstances might warrant the exaction of instantaneous obedience without stopping to show "social origin and social need"?

10. What practices in present-day education give evidence of each of the following:

- (a) striving to achieve harmonious development
- (b) failure to give free expression to individual capacities
- (c) emphasis on education as acquiring knowledge
- (d) stressing habit inculcation in education

11. What is the difference between educating the individual to serve the state and educating the individual so that he becomes socially most efficient?

12. Give instances, from the lives of animals and humans, of complete domination of the environment. Give instances, other than those presented in the text, to show that man is the active agent in the process of adjustment to environment.

13. Give two educational influences of each of the following:

- (a) state; (b) home; (c) church; (d) vocation; (e) recreational activity; (f) the theater; (g) the newspaper.

14. What people or nations frequently studied in the history of education would agree that both the aim and the process of education must be permitted to change? What people or nations persistently denied that education, to be effective, must change frequently?

15. Give instances of teaching, other than those presented in the text, which aim to make education a participation in life rather than a preparation for it.

PART II
EDUCATION AS PHYSICAL
ADJUSTMENT

CHAPTER II

BIOLOGICAL IMPLICATIONS IN EDUCATION

IN planning the development of living things, it seems natural to begin with those biological factors that determine growth. To thwart these forces may retard development; to follow them, accelerate nature's purpose, development. The biological implications in education are many and far-reaching.

Adjustment in Terms of Biological Development.—As we ascend the animal scale in tracing the evolution of man, we find a gradual increase in complexity and differentiation of function. At first, the animal must wait until food comes to it, then the whole animal eats. In like manner, the whole animal is occupied with the process of locomotion. The whole animal consists of one cell, its one organ, which performs all functions. The higher the creature in the scale of development, the greater is the number of its organs. Now, special functions pass from the organism as a whole to these differentiated organs which are special adaptations of tissue to facilitate the performance of certain functions. Generally speaking, the greater the number of new organs, the greater is the specialization of any one organ. With the acquisition of organs of greater specialization, the individual is enabled to gain added control of his environment. Nature's purpose, as far as the human mind can discern it, in the parallel increase of complexity and specialization, seems to be to grant each higher animal greater mastery of his environment. This clearly means more effective adjustment to the environment.

We have here an inference, not a proof. Our conclusion, though incapable of objective test, is borne out by a host of consistent facts—nature, in its development of man, seems to indicate that the aim of education must be to train each

individual to make the most effective adjustment between himself and his environment.

The Parallel Between Social and Biological Development.

—Biology gave direction to the development of all our social studies, especially sociology. We regard society as an organic whole in which each group has its allotted task. The higher the stage of civilization, the greater is the number of different groups in a society. Compare the few industrial and professional groups in 1800 with the numberless agricultural, commercial, industrial, transportational, semi-professional, and professional groups of our day. As the number of clearly defined groups increases, there is a greater specialization in the function of each group. And yet, all these groups seem to work toward certain socially desired ends. A modern society, like a higher organism, shows a high degree of specialization and integration. It is as much an organic whole as a human being. The development of society shows characteristics that are clearly biological.

Again, we make an inference; we come to a conclusion that is not capable of quantitative verification. Since society consists of highly specialized and integrated groups, education must bend its energies to the task of discovering capacities of the individual and of training him so that his distinguishing capabilities are fully invested in a specialized social function. But, once more, we are repeating our conception of education as a process of adjustment and giving it additional sanction.

The Psychological Significance of the Biological Implications in Education.—1. *Man, the Product of Environment.*—

Biology has given us an organic conception, not alone of society, but of mind as well. We regard mind, not as a bundle of different faculties—reason, memory, imagination, emotion, volition—ready to function as pressure is exerted, but rather as a highly integrated machine capable of almost any psychic reaction according to the experiences which arise in the life of an individual. The mind is shaped by its functions. It is neither good nor bad. It becomes either social or antisocial as experiences give it either morally desirable or undesirable

habits of reaction. The more it reacts in a particular way, the more it becomes expert in this specialized function and the less capable of undertaking new modes of activity. Man is therefore a product of environment. One of his outstanding characteristics is his educability, his capacity to become educated.

2. *Man, the Product of Inherited Powers of His Nervous Systems.*—But man brings to his environment a stock of capacities, a host of undeveloped abilities to perform one set of reactions better than another. Man is therefore the product of *inheritance*. What characteristics and powers man brings to life seem to be wrapped up in his central nervous system. We become what the nervous system determines.

If we accept specialization of function as a primary characteristic of animal development, and if we further accept our educational interpretation of it, we may have an answer to the question so frequently asked, "Why was the brain added to the total of organs?" It would seem, for no purpose other than the one which appears to have prompted the development of any organ—specialized function for more effective adjustment to environment. Consciousness, the great function of the brain, is therefore, in the words of James, "A super-added biological perfection" designed to serve the individual in the complex processes of adjustment. Again, we must recognize that we have made an inference, logical, to be sure, but an inference, nevertheless.

Brain and mind. Teachers often explain that they are interested in mind, not in brain, and speak of mental development aside from brain development, as if that were possible. It is highly important that we differentiate brain from mind. The brain is a physical organ, real and concrete; the mind is a function of the brain. The relation between muscle and action presents a close analogy; the muscle is a physical organ, the action is its function. One does not see motive force, yet he knows of its existence through its results. So, too, with mind; it is judged by its accomplishments. The mind is the realization of those powers and possibilities of the brain that are stirred to self-expression. The mind is the

function, the brain the organ, of consciousness. Since the development of function and the development of the organ are closely interrelated, brain development thus becomes a problem for education as well as for physiology.

The period of plasticity. Youth is often referred to as the period of plasticity or impressionability; youth, it seems, is the period of educability, for new experiences are eagerly and avidly accepted. After the age of twenty or twenty-five, a marked change in the attitude towards certain new experiences may be observed. A person over thirty may acquire the facts and techniques of a new science, but he rarely develops expertness in it. Similarly, a new language may be learned after twenty, but it is seldom spoken without foreign accent.

The differences in reaction of youth and of age may be traced to a number of impulses, all interplaying to make a complex design of behavior. To begin with, we must distinguish responses controlled by the lower centers, that is, the spinal cord and the cerebellum, from those directed by the higher center, the cerebrum. The lower centers care for experiences which are repeated; they are, generally speaking, the seat of habits. Modes of speech or of penmanship are fixed in the early years and we find it difficult to establish new speech or new penmanship reactions. But the cerebrum is concerned with the thought processes. An idea is given meaning according to the mental content at the time it is conceived. Patriotism means one thing to the child of twelve, something different to his older brother of eighteen; but with the mellowness of years, it may become the noblest form of loyalty or a glorified form of provincialism, depending upon artificial stimulation. What are the successive enrichments in meaning of the terms *modify*, *ratio*, *fraction* as the child renews his contact with them in the course of his schooling from the elementary school to college? Because youth knows little, they accept the new readily, whereas their elders are more critical, and may see, in their large experience, that the new is not as new as the young believe.

This characterization of youth and age is carried even

further in the reputed radicalism of the young and the conservatism of the old. New movements, new doctrines, new gospels, we are told, which fire the impressionable mind of youth are regarded with phlegmatic skepticism by those a generation older. Does the mind, in its maturing, acquire fixity of outlook that diminishes its reliability as a receiving station for what is distinctly new and in probable conflict with the old?

Attitude towards the new is conditioned by self-interest and previous emotional experience. The timid child, who found difficulty in making his social adjustment in school, looks with disfavor upon any attempt to change his school—he is a rank conservative. His father, who sees in a new business offer, large income and pleasanter work, is most eager for the change—he is a radical. The man of forty without skill in athletics, recalling the humiliation he suffered in his early games of tennis, is hesitant about learning to play golf—he is a conservative. His son of sixteen tingles with anticipation as he is about to enter a new sport—he is a radical. Our attitude toward a new experience is therefore a resultant of many forces, some emotional, some ideational, others social and economic. Radicalism and conservatism are relative conditions, determined not by age alone, but by additional factors that reach deep into one's life.

Conclusions of education. Youth is the period of the least number of inhibitions that have their roots in unpleasant memories or that spring from excessive weighing of opposing values. Youth is, therefore, the age that yields most readily to influences for good or for bad. This is the time to plant the seeds of an ethical life. The most potent influences of later life may not counteract the ill effects of early years. Our lives in this respect are not without parallel in the physical world. The sculptor applies his magic touch and while the clay is soft succeeds in impressing his genius on it. Apparently without difficulty he can bring out the finest line. But once the clay has hardened and has lost its plasticity, imperfections cannot be remedied; they are held fast in the newly acquired rigidity. Studies of the origin of criminality

tend to establish the conclusion that unsocial conduct is usually attributable to wrong impulses acquired in early youth. The psychology of our day, tracing the warps and the woofs of the fabric of our behavior, finds them in our youth. We are merely what life's experience has made out of our inherited equipment.

The function of education, biologically considered, is to develop the possibilities latent in the central nervous system. The keyword in this statement is, *develop*, for education is not a creative force; it can originate nothing. The brain has infinite possibilities which lie dormant, waiting for the magic touch to make them actualities. Education is the force which causes the human brain to bud, to blossom, and to bear fruit. The fruit is a well-developed mind approximating complete self-realization.

3. *The Period of Infancy in Man.*—The development of the inherited potentialities that lie within the central nervous system, requires long and varied reactions to the environment. Time is necessary. Mankind has, therefore, a protracted period of infancy, a long period of learning to adjust itself to its environment by repeated responses to every variety of experience.

Infancy in man and animal contrasted. A few weeks after birth, the little cub can run about and find its own food if necessary. The young stag, barely a month old, skips about, begins to feel life's responsibilities as he proudly surveys the landscape. If misfortune overtakes the parent animal, the offspring manages to survive. But in man the period of infancy is markedly lengthened. Great care is necessary in the days of helplessness. With all the attention that is bestowed upon us, almost one-third of the human race dies before the age of five. To understand why man's period of infancy is so protracted we must contrast the life of animals with that of man.

1. The animal is born a bundle of instincts. It can react to the environment almost immediately, for it need not wait to develop

1. Man, on the contrary, is born with fewer immediate instinctive reactions, but with many more possibilities to de-

the most important coördinations.

velop. He cannot react to his environment at once, because he must wait for the establishment of innumerable coördinations between mind and muscle.

When an act in the life of man or of an animal is to be performed invariably in the same way, its mode of production is prepared before birth. Breathing, digestion, heart action are examples of such prenatal organization. An animal's daily existence is essentially an everlasting repetition of the same routine; its life's activities are organized at birth. But man leads a life of change, of new adjustments, and consequently, most of his reactions must be acquired after birth.

2. The animal relives the life of its parent. If one studies the life history of any common animal he has studied the life history of its antecedents and of its progeny. Animal life is a perpetual repetition of the same needs, the same reactions, the same trials and dangers.

2. Man lives a life peculiarly his own. Each individual makes a special effort to cut away from the bonds of the past. It is confession of weakness to relive the life of one's ancestors. Man's individuating nature rebels and demands a life that is distinctly his own.

3. The animal leads a simple life. It has a few physical wants which are the sum total of life's call.

3. Man lives a complex life. His wants are many. With the satisfaction of his many physical wants, a host of intellectual and spiritual needs arise. It appears that new wants follow in the wake of every succeeding step in our development.

Educational implications in lengthened period of infancy.
As man is physiologically constituted, it would seem that he needs a longer period of infancy to prepare for his more complex life. Education must do for man, in his period of infancy, what nature does for the animal in its prenatal stage—train for adjustment to surroundings.

Generally speaking, the more complex the destiny, the longer is the period of infancy. The butterfly has a simple life and a simple mission to fulfill. The cocoon bursts open,

the butterfly unfurls its wings and begins to flit about at once. The little chick spends a few hours after its release from its prison shell trying to actualize its powers. It shows almost all the necessary reactions soon after its birth. The little kitten, helpless for a few weeks, is then ready to start out on its life's journey. As we ascend the animal scale the period of infancy is, as a general rule, constantly prolonged. The new-born ape is the most helpless of all animals below man. For an entire month young apes cannot stand alone; "they begin life as helpless babies, and are unable to walk, to feed themselves, or to grasp objects with precision until they are two or three months old." The period of infancy in man's life is far longer than in many of the lower mammals; in civilized man it is more protracted than in the savage.

Swift sums up our position admirably: ¹

Animals that are born fully developed are incapable of sudden adaptive changes. Their nervous systems are built to explode in certain ways and the appropriate stimulus is the igniting spark. A ready-made nervous system ceases to be efficient the moment the environment becomes changeable. Nervous structure must keep pace with the growing complexity of surrounding conditions; and, as man was born amid the throes of climatic convulsions, a nervous system with fixed reaction could not meet his needs.

Hence, unlike the brutes, man must pass through a period of helplessness, a period of infancy, when the whole nervous and mental apparatus attune themselves to the complex destiny they are to serve.

Social significance of man's period of infancy. Fiske and Butler have made the lengthened period of infancy a subject of much interesting speculation. Both find in this period the origin of our basic moralities. They argue, in man as in animal, the period of infancy is the period of parental attachment. But in man, this period lasts long enough to make its social effects permanent. In the period of dependence, the child is the common bond between father and mother; it

¹ E. J. Swift, *Mind in the Making* (Charles Scribner's Sons, 1910), p. 144.

centers both their individual interests upon its well-being. Their hopes and aspirations are wrapped up in the child. Even after it is physically capable of caring for itself, the parents feel that there are intellectual and spiritual preparations to be made for it. This period is then continued beyond the age of mere physical helplessness. Hence, these writers conclude, the permanent family is born and the basic moralities of home relationships established. The higher the civilization the longer will this period of infancy last, for it means a period of education. To-day the educational period of infancy lasts through the kindergarten, elementary school, high school, and college, a period "almost double the psychic point of adolescence," a period which John Fiske places at a quarter of a century.

This explanation of the period of infancy in man must not be accepted for more than it really is. It is an inference, logical and perhaps probable, but not a definitely established fact. It is a theory, which is not without its practical consequences. Social reformers have used it to strengthen their demand for a lengthened period of control of the child by the school. Little by little, the age of compulsory school attendance has been advanced to fourteen and sixteen. In more recent years, the state has extended its control of youth, insisting that even though employed, boys and girls under seventeen who are not graduates of recognized high schools, attend continuation school at least one-half day each week during the usual working hours. Here is a bit of theorizing not without very practical and very desirable results.

4. *The Child not the Miniature Man.*—The lessons of biology laid the ax for all time to the old notion that the child is a miniature man, and that man is merely the child writ large. Rousseau attacked the belief that between child and adult there is only a quantitative difference.

We believe to-day that the child has the promise of manhood in him but in the early stages he is a being qualitatively as well as quantitatively different from the grown-ups about him. The cravings, the attitudes, the mental powers, and the emotional reactions of youth are distinctly different from

the powers and the outlooks of adults. The child as a human being is as distinct in many vital respects from his parents as a member of one species is from a representative of another.

This is no idle distinction between the preëvolutionary and the modern conception of childhood. It has very practical bearings on courses of study, methods of teaching and character of discipline. If the child is merely man in miniature, then it must follow that the child has the same modes of reason, imagination, capacity for emotional response and volitional control as an adult; that the difference lies in the quantity or degree of the power. Small wonder, then, that educators like Milton prescribed the same round of subjects for pupils of all ages. All studied Latin, Greek, and Hebrew—the younger children received shorter assignments. All were held to the same rigid standard of conduct—the older pupils received more severe punishment for transgression.

But if childhood is a stage distinct and apart, we must recognize its interests and its innate capacities. Courses of study must contain different subjects for pupils of different stages of development. In like manner the mode of teaching must be differentiated. Nor are we justified in expecting the same degree of control from all children. Hence, standards of conduct and modes of discipline change as education progresses through the various stages from kindergarten to college.

This discussion of biological implications for education is not complete. We have said enough, we hope, to lay a basis for our program of physical education. In later chapters, we shall amplify this fundamental thesis and make appropriate applications to mental development.

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- SWIFT, E. J., *Mind in the Making* (Charles Scribner's Sons, 1910), Ch. v.

QUESTIONS FOR DISCUSSION

1. This chapter deals with inferences rather than facts. Point out vital differences between an inference and a fact, assuming all the time that the inference is carefully drawn and based on experiences worthy of respect. List the most important inferences contained in this chapter and give the justification for each.

2. Consider two individuals whose conduct is very different. To what extent is the conduct of each determined by his environment, past and present? To what extent, by inheritance? Make the answer as complete as possible and include only positive facts.

3. List one or more fears, superstitions, or, intense aversions that you may have; for example: fear of darkness, dislike to walk in high grass at night for fear of snakes, unwillingness to be the thirteenth member of a party, etc. Analyze these attitudes and show whether they are due to experiences of youth and whether they persist in the face of the reassurance of mature reason.

4. What facts would you marshal to support the assertion, "The primary characteristic of human level of life is its educability"?

5. At present under our system of eight years in the elementary school, four years in high school and four years in college, a student may not begin his medical course until he is twenty-two. He graduates from an approved medical school at the age of twenty-six and then begins his hospital service which ends at twenty-eight. What can be said against this late entrance to medical schools? Where can time be saved? How can time be saved without giving the student inferior preparation?

CHAPTER III

A PREVENTIVE PROGRAM IN HEALTH EDUCATION

The Program for Health Education.—The immediate task in the education of youth is to help it meet the demands which life makes for physical well-being. We shall discuss various activities in health education. Before analyzing any one of these in detail, it seems wise to present an outline of the entire program of health education. The comprehensive view of what a school may undertake in the interests of health will help the reader to keep facts in their proper relationships. The classification is sometimes fluid—activities placed in one group may, with justice, be included in another, depending upon specific conditions and needs.

AN OUTLINE OF ACTIVITIES IN A PROGRAM OF HEALTH EDUCATION

I. Direct Means

A. The Preventive Activities :

1. Hygienic standards of the school
2. Inculcation of daily health habits
3. Retarding the development of fatigue
4. Prevention of malnutrition
5. Ample opportunity for play and recreation

B. The Corrective Activities :

1. Physical investigation by teachers
2. Medical examination by physician
3. Corrective gymnastics, general and special
4. Follow-up work
5. The open-air class

C. Developmental Activities :

1. Play
2. Gymnastics
3. Athletics and physical recreation

II. Indirect Means

- A. The Teaching of Hygiene
- B. Sex Education
- C. The Inculcation of a Social Sense

The Hygienic Standards of the School.—The school cannot consistently teach health unless it assures its pupils physical conditions that meet reasonable hygienic standards. Let us outline some of these demands.

Location.—A school building should be built on land that is removed from excessive noise, from sources of dampness and foul odors. As far as circumstances permit, the building should face a park or a space that bids fair to remain permanently unencumbered.

The listing of these requisites seems superfluous, for who would fly in the face of ordinary good sense? Yet the writer can list at least twelve new school buildings constructed in the last four years, at costs varying from half a million dollars to three and one-half million dollars, that face busy railroad stations, elevated roads, garbage dumps, and vast stretches of marsh lands. Think of the nervous wear of teaching and being taught in rooms that face an elevated transit line on which six- and eight-car trains thunder by, every two or three minutes.

Exposure of Rooms.—As far as possible, store rooms, offices, and stairways should be given the least desirable exposure. An expensively built private school fronts south on a public park. On this side of the building one finds offices, supply rooms, stairways, and teachers' rest rooms. On the opposite side, facing north and opening into tenement court yards are the classrooms of the primary grades. What excuse can one offer for such errors which cannot be corrected? Why bathe supply rooms and stairways in warm sunlight while little children work in dark rooms?

Cloak Rooms.—Parents may justifiably expect that pupils will not be asked to hang their outdoor apparel in cellars. Well ventilated cloak-rooms, large enough to give each pupil his own locker, must be provided. Think of teaching hygiene

to a group whose coats and hats are piled into three high mounds on the rear floor!

General Cleanliness.—As a rule, school buildings are not clean. Dust gathers freely and is dislodged from its resting place by the periodic applications of a feather duster. It soon finds its accustomed place again. Floors are infrequently washed; more often, they are oiled during vacations without removing the dirt of years. In these days of electricity and vacuum cleaners, what housewife, with any standards, employs the methods by which schools are so frequently swept and dusted?

Light, Heat and Ventilation.—How many school rooms have window space that is one-fourth of the floor space? How often does the light come from the wrong direction? Is the room kept at a temperature of 66 or 68 degrees Fahrenheit? Is ventilation obtained by approved mechanical methods or by a system that causes some children to shiver under open windows, while others in the same room grow drowsy from overheated vitiated air? The open windows do not always change the air in all parts of the room; at times they permit a too rapid circulation of air in the classroom, at other times, too little. Auditoria in schools that assemble large groups of children throughout the day for special activities are especially ill-ventilated.

We have a few scientifically established facts to guide us in matters of ventilation. We know that the amount of carbon dioxide (CO_2), in an ordinary classroom, is usually not enough to cause any ill effects; that the depletion of oxygen in a badly ventilated room is not enough to justify apprehension; that comfort is secured by (a) keeping the air in motion, (b) keeping the temperature below 70 degrees, and (c) keeping the humidity or moisture in the air at about 50 per cent. Overheated air that is not in motion forms a blanket about the body that prevents the body heat from escaping. Overdry air takes moisture from the body, especially from the mucous membranes of the nose and throat. Chronic throat dryness often results.

: The necessary conditions of coolness, moisture and motion

can best be secured by mechanical devices which are not inexpensive. Very frequently one finds a complete complement of ventilating machinery idle or ineffective because it is supplied with too little power. The cost of running ventilating machinery at full power may be met, in a measure, by saving in coal when overheating is consistently prevented.

Other Hygienic Demands.—If the school is to prevent ill health and cause no physical defects, it should cease the overcrowding of children in classrooms, in auditoria, on stairways and in yards. Children too close to one another pass on respiratory and skin infections at an alarming rate. Materials like books, pencils, erasers, and rulers should not be distributed promiscuously. Each child's full equipment can be segregated by the use of stout envelopes. Desks and seats must be suitably adjusted, lavatories must be scrupulously cleaned, and approved sanitary drinking facilities must be provided. Surely, these are no extravagant demands in the interest of health. Examine schools in rural and small town communities as well as those in large and rich cities and note how few of them escape adverse criticism in these matters of simple housekeeping.

Daily Inspection.—*What to Look For.*—Pupils should be led to understand that the health of the school community requires that standards of cleanliness be set up and an inspection be made daily to ascertain whether each pupil is living up to them. So valuable are these daily inspections, that many states now require them by law. What shall the teacher look for?

1. Hair: is it clean? brushed? does it need cutting?
2. Face, neck, ears, eyes: are they clean? are there any secretions from eyes or ears? Is the skin free from suspicious eruptions?
3. Hands: clean? nails cut and clean?
4. Clothing: brushed? buttons missing? mending needed?
5. Collar and tie.
6. Handkerchief: has each child a handkerchief fit for use?
7. Shoes: polished? badly torn?
8. Signs of contagious disease: many courses of study direct teachers to look for symptoms of various diseases. The un-

trained eye of the teacher looks but does not see unless the child complains of definite pain or discomfort or unless he coughs and sneezes excessively. More professional service than the teacher can render is needed here.

The Procedure.—Teachers must routinize these daily inspections. To add to their effectiveness, two conditions are necessary. First, children must understand the social need of these demands. They must be made to realize that they are not the arbitrary dictates of the teacher but rather the means of safeguarding the health of the class. Second, these requirements should be mimeographed or printed and placed in the hands of the pupils. They must know definitely what is required. Encourage them to make self-inspections, to rate themselves and bring about, by themselves, necessary improvements. Without adequate motivation and willing coöperation, the values of the inspection are materially reduced.

At a given command, children, remaining seated, face the aisles, expose their handkerchiefs and then put both hands on the desk. The teacher, with pad in hand, passes up the aisles and makes rapid notes of her observations. A word of praise or of encouragement or of warning is given as needed. The more serious criticisms are offered in private. After a few days, the inspections can be made in a few minutes because most children make every effort to meet the required standard. The teacher soon learns to distinguish those who need a passing glance from those who require a more searching inspection. In the high school, an elected student committee, coöperating with the department charged with the teaching of health, can perform, in a measure, the service rendered by the teacher of the elementary school.

Children who persistently fail to meet the required standards should not be harassed before inquiry is made concerning their home conditions. Here is an excellent occasion for the service that can be rendered by the visiting teacher, the liaison officer between home and school.

The Values of Daily Inspections.—There are two outstanding educational values of these daily inspections con-

ducted according to the plan outlined. First, children acquire a set of habits that make for better health and, therefore, for greater personal effectiveness and happiness. Second, habits of cleanliness are not unrelated to self-respect. Conduct is often in close keeping with exterior appearance. There is a dignity in cleanliness that frequently prompts better behavior.

Fatigue and Personal Achievement.—*The Meaning of Fatigue.*—We commonly speak of being *tired* or *bored* or of suffering from *ennui*. We must not confound fatigue with these indefinite states of tiredness, boredom, or *ennui*. Fatigue refers to a very different condition. It is a physiological state in which more waste products or toxins are forming in the body than can normally be carried off. There is a process of waste formation going on in the body all the time. Compensating processes of waste removal and renewal of tissue keep the organism fit. If, for some reason, an excess of waste is formed or the processes of waste removal and tissue renewal are slowed up, toxins gather and soon make themselves felt.

We have objective evidence of this toxic state, fatigue. Chemical analysis has shown these toxins to be lactic acid and acid potassium phosphate. It is possible, by repeated movement, to so fatigue a "nerve-muscle preparation"¹ that contractions cease to occur unless electric stimulation is employed. The center of fatigue seems to be "the point of connection between the nerve and the muscle at the muscle plate."² The toxins that are formed may be washed out by weak saline solutions. The nerve cells show shrinkage of the nucleus when fatigued. Pigeons when fatigued show lighter colored brain cells than is normal for them. More interesting evidence can be presented. Inject the blood of a fatigued dog into another that has rested and seems eager to frisk about. The second animal soon shows all the fatigue symptoms of the first.

¹ W. B. Pillsbury, *Education as the Psychologist Sees It* (The Macmillan Co., 1925), p. 286.

² *Ibid.*

Symptoms of Fatigue.—There are many signs that give evidence of fatigue. We shall discuss these under two heads: physical and mental.

One of the early *physical symptoms* of fatigue is restlessness. The first deposits of toxin seem to act as an irritant to the muscles and produce greater movement. As the toxins increase, comparative inactivity follows. Dizziness, slight nausea, loss of appetite, pain in muscles and joints, yawning, drowsiness, and a desire for sleep with inability to sleep are common physical symptoms. As a rule, there is a decided loss in powers of coördination. The person who, under normal condition shows slight hesitancy in speech, finds himself stuttering over sounds that usually give him little concern. Penmanship and drawing are decidedly poorer in quality if performed during fatigue.

A few simple physical tests of fatigue may be made by any teacher. Ask pupils to extend arms, full length, parallel to the floor. Under normal conditions, each arm from shoulder to finger tips makes a fairly straight line, the left arm usually slightly below the right in all right-handed people. In fatigue, the *weak hand balance* is seen. Now the hands show a decided droop at the wrists. The muscles seem to lack the energy needed to sustain the weight of the hands. Ask fatigued youngsters to *hop* across the room and note the failures. Make the requests of the same children when they are rested and their improvement is truly surprising. In fatigue, the muscles of the trunk cannot overcome the force of gravity as the body resting on one leg is put into unstable equilibrium. Fatigued people often show *finger twitches* when the hands are opened wide so that fingers do not give one another mutual support. Note carefully whether the twitches show any regularity. Seemingly unstimulated movements, *tics*,—for example, a twitch of the face, a shrug of the shoulder, a roll of the head—that show regularity are serious enough to require the physician's examination. Tics are not necessarily symptoms of fatigue. Those predisposed to them, usually show them during acute fatigue.

We have no conclusive evidence to show whether fatigue

affects our metabolism, that is, the normal relation between the waste producing and tissue rebuilding processes. Data carefully gathered seem to show that prolonged mental work tends to decrease blood pressure and to increase the amount of adrenin in the blood stream. These changes seem to be nature's method of maintaining normal body function, because adrenin acts as a tonic and increases, for the time, capacity for work.³

The *mental symptoms* of fatigue are just as numerous. Among them we must mention diminished (a) attention, (b)⁴ power of recall, (c) power to retain new experiences, and (d) capacity of comprehension. Accompanying these there is an increase in (a) irritability and (b) the threshold of stimulation. The amount of sensory stimulation—heat, pressure, color change, sound change—necessary to gain recognition by the mind is the threshold of stimulation for that sense. In fatigue, we are less acute to sensory appeals and hence greater stimulation is necessary to insure mental reaction.

Fatigue may be acute or temporary and chronic. There are people who are almost constantly suffering from excess of waste deposits. The majority, however, usually become fatigued by excessive indulgence in work and show these physical and mental symptoms in aggravated form. For them, rest brings complete relief.

We must stress at this time the marked individual variations with reference to reactions to fatigue. So different is the effect of fatigue on individuals, that many students of the subject believe that "signs are not indicative of fatigue." We know that a desire to complete a task may overcome physical disinclination. The work in question is carried beyond the point of fatigue and is done, very often, with marked accuracy. The prolonged and feverish application of the inventor or the student who must have his report ready, are examples. Unusual excitement may paralyze one person and make another work all the better, but the ill effects will show

³ For a more detailed account, see topic, Endocrine Glands, chapter on Emotions.

a day or two later. Due allowance must therefore be made for variations in individual reactions.

The Causes of Fatigue.—The *primary physical cause* of fatigue is excessive activity. Usual activity produces waste which the recuperative processes carry off and for which they make the normal renewal of tissue. When one plays his accustomed hour of tennis he becomes tired. Should he continue strenuous participation for two hours, he passes the point of tiredness and experiences the effects of fatigue.

The *contributing physical causes* of fatigue are conditions that retard the recuperative processes. Malnutrition, continued bad ventilation, insufficient sleep or rest interfere with waste removal. Toxins are not drained off in the required quantities and the circulatory and lymphatic systems carry them to the rest of the body.

Investigators are not agreed on the seriousness of mental conditions that may produce fatigue. Some believe that mental work, even of an intense kind, cannot cause enough surplus of toxins to create fatigue. Such waste materials as are deposited, they hold, can be overcome through the accumulated nourishment in the blood that is supplied to the tissues. Others believe, "Mental work has definite physical accompaniments that are at least similar to the results induced by physical work."⁴

There are mental conditions that either retard recuperative processes or give added zest to the individual so that he may overcome the ill effects of fatigue through added effort. These are *fear* or *anxiety* and *monotony*. Dislike for a particular task, worry of possible failure, fear of punishment—these set up anxiety neuroses which inhibit action, thus causing both retardation in the waste removal processes and an increase in the effort necessary to achieve a definite end. Work that is pleasant and undertaken to achieve a purpose that is clearly socially necessary, prompts greater effort and quickens physiological action throughout the body.

From this analysis of causes, it seems clear that tiredness

⁴ W. B. Pillsbury, *Education as the Psychologist Sees It* (The Macmillan Co., 1925), p. 270.

follows normal activity; boredom follows either overindulgence in the same activity or failure to participate in any necessary activity; fatigue follows excessive activity. Accepting the explanation that a fatigued body is a toxic body, we find it difficult to justify the concept of mental fatigue. Fatigue is a body condition, a physiological condition, that produces definite changes in mental reaction but it is not a mental condition. The fever attending an attack of measles causes irritability and interferes materially with recall, retention, and comprehension of experience. We do not speak of mental measles even though there is definite interference with mental responses during the illness.

Protracted application to a mental task produces fatigue that is both genuine and simulated. Genuine, because the body is kept long in a sedentary posture; the inactivity slows up the recuperative processes. Simulated, because a feeling of monotony and a decided disinclination to continue are developed; inhibitions are set up and the subject is too ready to believe that he is no longer in condition to continue. Added effort, arising from a conviction that it is better to have done with the task, soon dispels the simulated fatigue and work may continue accurately and with good speed.

The Curve of Fatigue and the Curve of Work.—A definite indication of the degree of energy which a physically normal person has at his command in each successive hour of the working day would give a scientific basis on which economists and teachers might plan the work of those whom they direct. A graph representing the changing capacity for work is known as the *curve of work*; the graph representing the changing degree of fatigue during an exercise or during the working day is known as the *curve of fatigue*.

Difficulties in Accurately Plotting the Curve of Fatigue.—The determination of such a curve presents a set of peculiar difficulties. To begin with, fatigue or capacity to work is measured indirectly, by the quality and the quantity of the output. But a person fatigued may, for various reasons, desire to see a task completed. Extra effort is focused on it and the effects of fatigue are counteracted. In this complex

situation, how can one determine what would have been produced without this strain of will? The emotional accompaniments of a situation, therefore, have a decided effect on the product, either increasing or decreasing it, but they defy any attempt to measure them.

Similarly, the activity preceding the test will influence the results achieved during the test period. It has been found that better work can be done in the middle of the afternoon than at the beginning. What if the children had trying experiences in the early part of the afternoon session? What will they achieve in the half hour from two to half past two? Controlling circumstances must always be taken into account.

It is extremely difficult to ascribe a result to one of a group of closely cooperating factors. It seems reasonable to insist that the amount and quality of work are determined by at least four factors, (a) fatigue, (b) special incentives to accomplish the task, (c) extent to which the activity is new or familiar, and (d) confidence in one's ability to succeed in attaining the desired end.⁵ Fatigue causes gradual but continuous decrease in the product. Special incentives accelerate the rate of work. At the beginning the incentives give the mind a set in the desired direction and prompt close application. Toward the end, there is often so great an eagerness to attain successful completion that a terminal spurt is produced. The more familiar we are with such a process, the closer we approximate habitual responses. What we do from force of habit requires less mental direction and insures greater accuracy as well as increased speed. Fatigue is definitely diminished by habituation. He who lacks confidence in his ability to achieve a given purpose is beset by anxieties which retard action. An abiding self-confidence brings joyous anticipation in assured success and thus quickens reactions. With these four factors constantly interacting, how shall we determine definitely the specific part that fatigue plays in attaining a result?

⁵ Kraepelin gives five factors: fatigue, practice, inertia, habituation, special incentives. See Offner and Whipple, *Mental Fatigue*, and W. B. Pillsbury, *Education as a Psychologist Sees It*, p. 271.

Methods of Plotting the Curve of Work.—Two methods have been evolved for approximating the curve of work. The first is through physical reactions. The subject continues his routine of work and at regular intervals tests are made with dynamometer to ascertain loss in hand grip; with ergograph, to measure loss of power in lifting and pulling with fingers; with sphygmomanometer, to determine decreasing pulse power. These tests are now used infrequently because the emotional accompaniments play so significant a part in achieving the results.

The second method is through psychological reaction. Here reduction in the rate of work and in accuracy are ascribed to increasing fatigue. The subjects are asked to cross out all capital A's in a text or to add columns of figures or to correct spelling lists of common words. Kraepelin had all the material printed and then rang a bell at regular intervals, say five minutes. When the bell sounded, each subject made a line to show the point in the task he had then reached. At the end of the test, the examiner can ascertain quickly the amount of work attempted each succeeding period of five minutes and its degree of accuracy. By these tests, absolute accuracy is not attained but modifying conditions are perhaps under better control.

The Curve of Work Approximated.—The curve of work for a given day seems to show the following characteristics: ⁶

(a) There seems to be an initial spurt due to pupils' intention to work faithfully this day. This period, indicated by *a* on the graph, does not last long.

(b) A decline in energy is exhibited after the third or half of the morning session. The pupils are now working with their accustomed attitude doing no more to-day than on other days. This period is shown by *b* in the graph.

(c) The decline becomes more marked as fatigue and other deterring factors grow. The letter *c* shows this period.

(d) There seems to be a terminal spurt before the noon recess as is indicated by *d* in the graph.

⁶ Compare with A. I. Gates, *Psychology for Students of Education*, Ch. xvi, and with J. B. Watson, *Psychology from the Standpoint of a Behaviorist*, pp. 352-359.

(e) The afternoon recess begins with a rising line of energy as is represented by *e* in the graph.

(f) Up to two o'clock there is a fair but slightly declining capacity for work. See *f* in the graph.

(g) The decline in energy after two o'clock becomes more marked and is therefore represented by a greater decline of the line *g* in the graph.

(h) There may be a slight spurt to bring the day to a close. See *h*.

Summing up these observations borne out by various observers and experimenters, the curve of fatigue may be represented as follows:

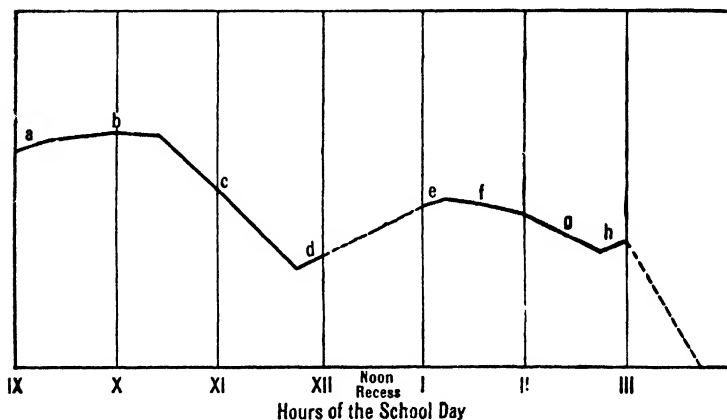


FIG. 1. GROUP SHOWING ROUGH APPROXIMATION OF CHANGING CAPACITY TO WORK

It is perhaps needless to say after our preliminary discussion that this curve does not represent an absolutely accurate condition nor does it tell the story of any one pupil. Not all experimenters agree on the character of the graph. It does, however, sum up the tendency toward depleted energy exhibited by a whole class that has had no unusual or disturbing experience.

Classroom Applications.—1. It is probable that the normal child working under conditions that prevail in the usual American school shows little fatigue that can be ascribed directly to the day's routine of the class. The appeal to

special incentives, the motivation of instruction, and the utilization of motor and visual aids will overcome in great measure the fatigue that is engendered through participation in class work. The more rigorous the program, the less motivated the instruction, the greater the emphasis on memorization of text and the severer the penalties for failure, the more rapidly does fatigue develop.

2. Young children of six and seven are easily fatigued. As the child grows older less fatigue is developed by a similar routine of work. It is necessary, therefore, to devise for pupils in the first two years, a daily program of short periods with many opportunities for rest and non-tiring play.

Experience seems to indicate that the length of a period bears a very significant relationship to the quality of work which pupils perform. There is a point beyond which added time and energy yield a disproportionately small return. Teach arithmetic to a fifth-year class beyond thirty minutes and the decrease in quality and quantity of work in each successive ten minutes is marked. More boredom than fatigue is very likely developed by the usual half-hour of arithmetic. But the disinclination to continue with arithmetic sets up inhibitions and quickens the development of fatigue. The whole condition therefore militates against successful mental reactions in unduly extended periods. School people are agreed, in the main, on the following length of periods for the different school years:

Grades	Average	Maximum	Exceptions
I-II	10 to 12 min.	15 min.	Manual activities, play, visits to places of historic, geographic or æsthetic interest may be planned for periods longer than the maximum here set forth.
III	15	20	
IV	20	25	
V-VI	25	30	
VII-VIII-IX ..	30	40	

3. Each subject very naturally induces fatigue. Since different experiences produce fatigue at different rates, Offner and Whipple sought to develop a "fatigue coefficient" for each subject. They regard the morning session as better adapted for subjects requiring intense concentration like arithmetic and memorization.

Bagley evolved a table of relative fatigue values of the subjects that make up the elementary-school curriculum. He gives the subject that begets the greatest amount of fatigue an arbitrary value of 100 and then allots to each of the other subjects a fatigue value indicative of its power to generate fatigue. The values set forth by Bagley are the composite fatigue values ascribed to each school subject by leading investigators of fatigue. Formal gymnastics without music, and mathematics head the list with 100. Foreign languages and formal language lessons on the vernacular, including grammar, have a fatigue index of 90. History has 85; geography and nature study, 80; drawing, 60; singing, the least fatiguing, 40.

Of course, these indices of fatigue are mere approximations. It is interesting to note that, excepting drawing and music, the greatest range in fatigue values is 20 points. The difference in power of two subjects to induce fatigue is not marked and is readily overcome by effective teaching and the stimulation of incentives in the pupils through rational motivation.

4. The time-honored advice to counteract fatigue is "do physical work and do other work." Since fatigue is produced by work, doing physical work or other mental work may only add to the fatigue already present.

Nevertheless, there is more wisdom than scientific precision in the old prescription. Remember that what is induced by school work is usually disinterestedness or even boredom rather than fatigue; hence, a change in occupation or a respite from mental work revives interest in class activities and secures a more spirited response. Short periods and a reasonable opportunity for play are absolutely necessary. To intensify the values of recreational periods, let the children play in the

open air or if that is not possible, in a classroom with marked improvement in ventilation, through opening of windows. True, energy is used up during the play but the quickening of the recuperative processes and the feeling of pleasure that ensues, will more than counteract the slight drain in vitality. Formal calisthenics offers doubtful relief from the tedium of class work.

5. Subjects requiring careful coördination like penmanship, accurate drawing, corrective gymnastics, and speech drills for those with speech defects should not be given in the unfavorable periods of the day, *i.e.*, in the last hour of each session or in the first period of the afternoon. These subjects call into play the fine accessory rather than the large fundamental muscles and a large number of coöperating nerve centers. The coördination of muscles and nerve centers is never well performed in unfavorable periods of the school day.

6. The relative value of morning and afternoon sessions is not scientifically settled. Most investigators believe there is a slight advantage in the morning sessions. Others believe that the afternoon session is less desirable for young children but equally effective for pupils over twelve or thirteen. Much scientific experimentation must still be done with this problem before we can speak with any degree of finality.

7. The noon recess ought to be prolonged. For most pupils the customary hour for lunch is seriously shortened. They are dismissed at 12 and are required to be in school not later than 12.55. The walk to and from school and washing of hands take at least fifteen minutes. Children who eat in school must wash and wait to be served. They, too, usually spend fifteen minutes. This leaves a maximum of forty minutes for eating, resting, and playing. Small wonder that there is so much restlessness in the afternoon. A longer noon recess would serve health and make for smoother afternoon routine.

8. Much can be done to counteract the effects of fatigue by improved methods of teaching. Our discussion disclosed the significance of proper incentives. Fatigue induced by school work is not acute or chronic; it brings only discomfort

which pupils can easily overcome if they are so minded. Adequate motives to counteract the ill effects of fatigue are assured by teaching which begins by positing real problems that invite solution, which stresses doing rather than memorizing the printed page, which is socialized so that children express themselves and exchange ideas freely, and which is enriched by every variety of visual appeal.

Reducing Malnutrition.—*Extent of Malnutrition.*—In the absence of an exact and universally accepted measure of nutritional status, estimates of malnutrition among school children vary from 1 per cent to 50 per cent. By the use of the Dumfermline Scale,⁷ it would appear that 15 per cent of the children in the public schools of New York City are suffering from malnutrition. Dr. S. Josephine Baker, Director of the Bureau of Child Hygiene of New York, sets the figure at 20 per cent. Studies of small groups of children living in poorer sections of American cities, often reveal the rate of malnutrition as high as 33½ per cent. Estimates in government reports give the number of malnourished children in the United States in millions.

Meaning of Malnutrition.—There is no fixed definition of malnutrition. To some it means "a general condition of less than normal physical and mental vigor."⁸ It is a term that includes general vigor and total health. Height-weight relationship, hæmoglobin normality, muscle tone, quality of actions, and intensity of mental reactions are given as measures of nutrition. It is evident that the explanations of the conditions are as indefinite as the term itself. Malnutrition is a degree of health determined in turn by the degree to which the body renews tissues and achieves its full possibilities of growth.

How Is Malnutrition Detected?—Since malnutrition manifests itself in retarded growth, the usual method of judging the nutritional status of a child is by anthropometric measure-

⁷ Frank A. Manny, "A Scale for Marking Nutrition," *School and Society*, Vol. 3, No. 56 (January, 1916), pp. 123-124.

⁸ J. C. Gebhart, "Malnutrition and School Feeding," U. S. Bureau of Education Bulletin No. 37 (1921), p. 1.

ments—relation of height and weight to age, chest expansion, hand grip, and the like. The most common single measure of malnutrition is the weight of a given child compared with the average weight of children of the same *sex, age, and height*. A margin of deviation of 7 per cent is allowed. The child whose weight is 7 per cent or less below the average weight of children of the same sex, age, and height is deemed normal. The child more than 7 per cent below this average is rated as malnourished.

Difficulties at once arise. What if a child who is more than 7 per cent below the accepted average, eats well, sleeps well, is active, happy, and meets successfully the physical demands life makes on children of his age? Is he malnourished?

The height-weight standard was tested on 9,973 white children of native parentage. These were examined by physicians who "judged them by clinical evidence" and then rated them in respect to nutrition as "excellent," "good," "fair," and "poor."⁹ The conclusions we must draw from this and other studies are interesting. First, in the main, children of "good" or "excellent" nutrition had greater weight and larger sitting and standing height than those rated "fair" or "poor" in nutrition. Second, weight measurement alone is not a sufficient index of nutrition. Some children in the "excellent" nutritional group and more in the "good" nutritional group are as much under the average weight as some in the "poor" nutritional group. Third, to judge nutritional status, physical measurements, other than mere weight-height-age relation, are necessary. Fourth, sufficient allowance must be made for differing racial characteristics. Not all races have the same norms of growth.¹⁰

Causes of Malnutrition.—The prevailing cause of malnutrition is incorrect and wholly inadequate diet. Children are given wrong kinds of food, are subjected to irregular living,

⁹ Clark, Sydenstricker, and Collins, "Weight and Height as an Index of Nutrition," U. S. Public Health Service Reprint No. 809 (Public Health Reports of 1923).

¹⁰ Hunt, Johnson, and Lincoln, *Health Education and the Nutrition Class* (E. P. Dutton & Co., 1922).

are not provided with a proper place for sleeping, are allowed too little sleep, and are needlessly subjected to contagion because of the ignorance of parents. These are conditions that make for malnutrition. Infected tonsils, defective teeth, residual conditions of diseases like scarlet fever are often contributing factors in malnutrition. Parents may not be ignorant, but poverty and the resulting low standards of living may be responsible for malnutrition. The vicious circle is always in full evidence—the malnourished cannot keep up in the struggle for a livelihood and sink to a level of poverty which in its turn continues the forces that spell malnutrition.

How Can the School Help Reduce Malnutrition?—Teachers and supervisors can do much to decrease the rate of malnutrition. An inquiry into the diets of malnourished children usually reveals wrong choice of food. The money spent on “coffee and crullers” for breakfast can procure an egg and a glass of milk. In the United States the cereals of greatest food values are the least consumed, but the cereals of least food value are the most consumed. This is a result achieved by modern advertising. Not always poverty but often ignorance is the greatest factor in continuing malnutrition among school children.

In its hygiene instruction the school must therefore stress diet. Children must be taught that all that is fit to be put into the mouth is not necessarily good food. Food must be classified for them into strength builders, bone builders, muscle builders, and blood makers. They must be led to an understanding of the fuel foods that supply energy. The body will live, if it possibly can. Unless we supply fuel foods the body uses itself up in quest for fuel. No little time should be spent by boys as well as girls on planning inexpensive but nutritious breakfasts, lunches, and suppers. When children ask, with school sanction, for different but not more costly foods, parents are likely to grant their request.

The school must carry on a vigorous campaign with parents through parent associations. The work done with children must be adapted and elaborated for their parents. Through talks, charts, demonstrations by local physicians, stereopticon

views, distribution of government reports¹¹ they must be taught the fundamentals of child care.

A third remedial measure that the *school may undertake is limited feeding of its children*. Children who cannot go home for lunch either because of distance or absence of mothers who work, should be able to purchase, at cost, a warm meal. All children who want milk and crackers or fruit during the long morning session, should have an opportunity to purchase this supplementary food. Children whose mothers are employed, may be given enough lunch money to buy proper food. Observant teachers know how unwisely these hard earned pennies are spent. These unfortunate mothers should have assurance that the school will provide the lunch that circumstances make it impossible for them to prepare.

England has established the most extensive system of school feeding and boasts of unmistakable public support of this new enterprise in health education. France has taken definite steps in the same direction. In the United States, the movement has passed the experimental stage but it lacks popular approval. The arguments against school feeding arise in the perennial dread that democracy may degenerate into paternalism. Is it less paternalistic to give free medical care to those who are susceptible to every ailment because of low resistance due to malnutrition, than to provide a system whereby food may be purchased at cost in a school building? Others protest that it is no function of the school to feed children; the school is to educate. But who can set the limits of the educative process? Is it not the business of the school to render children more fit to profit intellectually and spiritually by the regimen it has to offer?

A strong case can usually be made for school feeding at cost. Where the health of children is concerned neither money nor inconvenience of officials counts. Aside from the obvious physical gains, there are three considerations that increase

¹¹ Lucy W. Collier and Harriet Wedgwood, "Child Health Program for Parent-Teacher Associations," U. S. Bureau of Education, Health Education Bulletin No. 5 (1924). This report and the health leaflets will give interesting material for parent association meetings.

the value of school lunches. Children are given concrete and systematic demonstrations of correct diet. They are, in a measure, weaned from excessively seasoned food and sweets. Little by little the body begins to crave for food that is nourishing. Second, the opportunity that the school now has of teaching certain children proper conduct at table is of no little significance. And finally, it may be granted that at the school lunch table pupils may make friends and establish social contacts under proper supervision. More than one pupil who does not go to his home for lunch drifts into habits that are apt to bring sorrow to both home and school.

Providing Ample Opportunity for Play.—With significant changes in life come serious changes in the scope of education. When population was essentially rural and when fields and brooks invited children to play, the school had no need to concern itself with providing recreational facilities. With the phenomenal growth of cities and the urbanization of communities, space is preëmpted for serious business of adult living. The school must therefore restore to the child its lost play opportunities.

The child lives a threefold day—a play day, a work day, and a rest day. The school, it is agreed, must teach how to work. In present social living, the school must make ample provision for the play day as well. Open air playgrounds, enclosed playgrounds, gymnasia, specially equipped roofs, swimming pools, and tennis courts are as much part of a school equipment as the library or the laboratory.

We must rid ourselves of the idea that the school day is limited to five hours between nine in the morning and three in the afternoon. It is still the custom, in most communities, to teach all children between nine and three, and to permit them all to play between three and six. Naturally, school and play space are congested. The work day and the play day need not be successive. They may intertwine. Some children may well be taught from nine to ten; during that same hour, others may play or visit the library under supervision and learn how to use reference books or how to select recreational

reading. A truly economical administration of public education cannot be attained by having all children taught at the same time, all play at the same time, all eat at the same time, and all visit the library at the same time. To insist that each activity carry its maximum load or none at all produces unbearable congestion. The relief very frequently is not to build added schools but to readjust the time so that some children play while others work.

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QUESTIONS FOR DISCUSSION

1. List all the hygienic demands that may reasonably be made of the school building. Allot values to the separate items according to their importance, for example, ventilation 15, adequate cloak room 5, etc., total 100. This will now give you a score card by which you can rate your school building. Make the score card and score your school building to ascertain the extent to which hygienic requirements are met. Rate a second school and make comparisons. What is the value of this method of evaluation over the general impression?

2. List the advantages and limitations of open window ventilation and mechanical ventilation. Which do you prefer? Does your preference hold for all seasons?

3. Consider various means of securing coöperation of pupils in matters of personal appearance and cleanliness. What means would you use with children in grades I-III? in grades IV-VI? in grades VII-IX? Would your task become simpler with pupils of grades X-XII? Why?

4. Prepare a chart which can be mimeographed and distributed to children and which tells them how to prepare for the daily inspection. Think of arrangement, wording, and modes of appeal.

5. What habits of work do you possess that indicate ability to overcome fatigue?

6. Construct a daily schedule showing a well planned school day for a second, fourth, sixth, and eighth grade.

7. What arguments, from the point of view of fatigue, may be presented against early departmentalization of school instruction?

8. Do you work as well in the afternoon as in the morning? Test yourself by adding figures, crossing out *A's* in editorials, memorizing poetry, and learning grammatical forms of a foreign language. What cautions must be kept in mind in planning the experiment? What checks or controls must be provided? What cautions in compiling and interpreting the data?

9. What are the effects of alcohol, tobacco, and vitiated air on the rate of fatigue formation? Do these accelerate or retard development of fatigue? Consult Pillsbury, *Education as the Psychologist Sees It*, pp. 282-286.

10. Look up, in a textbook of physiology of college grade, the following terms: metabolism, katabolism, anabolism. Using these terms, frame a statement giving the meaning of malnutrition.

11. Use the Woods' Weight-Height Chart (or any other recognized standard) and examine groups of twenty children of foreign parentage and of different races or nationalities—Italians, Irish, Jews, Slavs, Poles, Germans, etc. Do you detect racial tendencies or does each group approximate the averages in tables equally?

12. What in your opinion are the probable causes of malnutrition among children in the neighborhood of your school? List these causes in order of significance.

13. Through a simple questionnaire, secure lists of typical breakfasts, lunches, and suppers of 100 children. Criticize these in terms of the diet needs of growing children.

14. Write out your reasons for upholding or rejecting each of the following:

(a) School lunches pauperize school children.

(b) The school must under no condition assume a function that rightfully belongs to the home. Feeding children is a home, not a school, duty.

15. A school of 18 classrooms has an auditorium seating 150 and a gymnasium accommodating 75. It faces an open lot 240 by 100 feet which though unequipped is available for school use. The principal finds that he must organize 24 classes. What program can be made to give each child a full day of school supervision?

CHAPTER IV

A CORRECTIVE PROGRAM OF HEALTH EDUCATION

The preceding chapter is given to a study of the preventive program which schools must carry out in the interests of health education. But the school is not the controlling institution in the child's life. Despite its most intelligent efforts the school cannot prevent maldevelopment. We must address ourselves to a second phase in health training, "What can the school do to correct physical defects in its pupils?"

Health Inquiry by the Teacher.—*The Scope.*—Once each term each teacher may reasonably be required to make a systematic inquiry into the health of the pupils in her charge. This investigation should reach deeper than the superficial daily physical inspection which is concerned mainly with habits of cleanliness. With simple preparation, teachers can be qualified to make the following health examination:

1. Eyes—vision normal as corrected by glasses? free from inflammation?
2. Ears—hearing normal? evidence of inflammation?
3. Mouth—teeth clean? cavities filled? gums healthy in appearance? second or permanent teeth very irregular?
4. Skin—clean and free from eruptions and pediculosis?
5. Vaccination—good scar evident? Is certificate presented of successful vaccination within five years against smallpox?
6. Nutrition—is the child more than 10 per cent under weight or more than 20 per cent overweight as judged by scale?
7. General Character of the Child's Physical Reactions—is the child generally alert? playful? tired? drowsy?
8. Regimen of Living—is the child's diet correct? does it sleep long enough and under proper conditions? is it given adequate opportunity for play in the open air? is it overburdened by supplementary educational activities like music lessons, religious studies, dancing lessons, French lessons, etc.?

The Method of Conducting the Inquiry.—Assuming an average of forty-five pupils to a teacher, the task involved in these semiannual health checks is not very arduous. Items number 4, skin, and 7, character of physical reactions, can be observed during the ordinary class routine. At her leisure the teacher records her observations on an appropriate chart. Items 3, 5, and 6 can be ascertained in about half an hour with the aid of an intelligent upper-class pupil to record the teacher's findings. Items 1 and 2, eyes and ears, necessitate individual examination of pupils. The tests are simple and are readily secured.¹

The last item, number 8, inquiry into regimen of living, requires very different treatment. A personal conference with each child is time-consuming and may cause embarrassment to both teacher and pupil. A simple but well planned questionnaire may be more helpful in eliciting the information required. In a period usually devoted to written composition children are asked to answer the questions on a mimeographed form. In the preparatory oral work, various helpful and useless forms of reply are discussed so that children may know definitely what is required. They are then set to answering such questions as: In what kind of room do you sleep? How many people sleep in the same room? In the same bed? How many windows has this room? Are they opened at night? How much? When do you go to bed? When do you rise? . . . At what time do you eat your breakfast? What did you have for breakfast to-day? Yesterday? The character of the homes and the racial origin of the pupils should play a large part in shaping the questionnaire.

The Corrective Measures.—The teacher is now in possession of very important data. What shall be done with them to make the life of these children healthier and happier? Clearly, there will be revealed, in many cases, need for personal advice. Such children must be met individually and improved modes of living suggested tactfully and sympathetically.

¹ The reader is referred to the testing of vision and hearing as set forth in Turner and Betts, *Laboratory Manual of Educational Psychology* (D. Appleton & Co., 1924), pp. 24-33; 37-43.

The work in hygiene should have its origin in conditions revealed by this kind of inquiry. Now health instruction is richly motivated and opportunities for vital applications are plentiful. Health information becomes not more facts to be forgotten but a definite guide to better living.

Teachers and principals will find in such an inquiry pointed material to present at parents' meetings. The weaknesses of diets reported by children are explained, and suggestions for improvement are judiciously urged. Similarly, the school is in a strategic position to direct attention to other defects in the physical life of the child.

Much has been said for keeping a class health chart in full view of all children. Those pupils whose eyesight is normal and those who have corrected their sight by glasses have a gold star in the appropriate column; those with uncorrected sight, another symbol. Similar procedure is followed in matters of weight, teeth, etc. While much can be accomplished by such a device, it is not free from serious abuse. What of the child whose sight defies the skill of the best oculist? May we not develop an attitude of inferiority in some children?

Systematic and detailed study of the health of school children must be stressed in teacher-training institutions. It must be given a dignified place in the professional curriculum. It is not uncommon to find teachers who, by their mode of living, give evidence of ignorance of the simplest health practices. The emphasis in teacher-training schools is on mental, not physical, development as if these were separated aspects of growth—the former exclusively the business of the teacher, the latter, of the physician.

Physical Examination by the Physician and the Dentist.—

Once a year, the growing child should be given a complete examination by a competent physician. Nose, throat, eyes, ears, chest, abdomen, pelvis, arches, reflexes, posture—all the items in a thorough physical examination must be included.

The physical examinations now given by many school systems stand out as tragic waste and hypocrisy. Very many schools have no facilities for medical examinations; the physi-

cian sees as many as one hundred children in one hour; the children, fully clothed, with mouths opened and lower lids drawn down, pass in military line before the doctor. The size of the health card and the number of items on it inspire awe in the layman. But what are these health records worth?

In many instances an equally serious source of waste arises in the failure to use the doctor's findings. The health records are often sent to a central recording office where they are attacked by an army of clerks. The first crude numerical results are then subjected to statistical refinement by experts. But, what of the children? Frequently, they are completely forgotten in the machinery of administration.

The supervision of the medical staff of school doctors and nurses presents an important problem. Most cities in the United States hold the educational authorities responsible for the conduct of the medical examinations. In many large cities, the staff of doctors and nurses who enter the schools, report directly to the local health department.

A report of the extent of these two practices is based on replies received from 1,595 cities having a population of over 2,500. The results are vividly presented in the following table: ²

CITIES HAVING HEALTH SUPERVISION; AUTHORITY IN CHARGE

PUPIL ENROLLMENT	NUMBER REPORTING			PERCENTAGE WITH SUPERVISION	AUTHORITY IN CHARGE		
	Total	No Supervision	Supervision		Education	Health	Joint
					Per cent	Per cent	Per cent
10,000 or more	78		78	100	56	26	18
5,000-9,999	96	5	91	95—	71	7+	21+
3,000-4,999	132	11	121	92—	66+	12+	21+
2,000-2,999	221	41	160	72+	56—	8+	25
1,000-1,999	498	132	366	73+	57—	7+	36—
Under 1,000.	497	196	301	61	52+	14+	33+

² W. S. Small, "Educational Hygiene," U. S. Bureau of Education, Bulletin No. 33 (1923), p. 4.

The figures show that when the education department is in charge of medical examinations, the cost is 28.8 per cent greater than when the health department is in control. Also, that under health department control, there is one physician for each 5,648 children and one nurse for each 4,135 children but under educational control there is one physician for each 4,964 children and one nurse for 3,075 children. The cost of the plan of joint control is always high.

The greater cost of exclusive control by the department of education is, in the light of these figures, no condemnation of the educational authorities for their administration of the medical examinations. Fewer children to one physician must mean, all other things equal, more reliable examinations. Under educational control of medical examinations, the school has readier access to records, feels freer to call on the physician for help in special cases, and is in better position to follow out his recommendations.

Not infrequently, we are told that such regular examinations may be needed in slum districts where poverty or ignorance prevails, but to apply the same system to schools situated in more fortunate sections is sheer extravagance. Those who have had the opportunity of examining pupils in private schools frequented by the children of the rich, have had striking illustrations of the high rate of remediable defects among this wealthy clientele. Neglect is neglect whether it is due to poverty, ignorance, or the carelessness of hired governesses.

Corrective Gymnastics.—All children need corrective exercises. Some, because they have postural defects; others, because they are developing habits of wrong posture; and all because traditional school work makes for excessive sedentary posture.

Postural defects are often—though not always—accompaniments of nutritional disorders. Included in this category are round and winged shoulders, spinal curvatures, flabby muscles, fallen arches and flat-footedness, and protruding abdomen. Ordinary school calisthenics do not emphasize enough the correction of the specific fault and frequently force these chil-

dren into activity too strenuous for them. Postural defects tend to correct themselves with improved nutritional status.

Habits of bad posture may be found in children of excellent health. They have their origin in carelessness or, less frequently, in imitation of others who should never serve as models. Incorrect standing or sitting posture, peculiarities of walking gait, holding one shoulder higher than the other, tilting head to one side—these are illustrations of habits of incorrect posture which do not correct themselves with general improvement of health.

The *sedentary posture* of school work reduces rate of heart and lung action, cramps muscles of the legs, encourages other muscles to comparative inactivity, compresses the abdominal organs, and encourages a forward stoop. If the child is given adequate play in the open air and sufficient corrective exercises, no ill effects need result from sedentary school life.

Two types of corrective gymnastics should be provided. The first is *general* and planned for all pupils. Frequent short periods should be set aside during the day for lateral and upward stretching, deep breathing, knee bending, trunk bending backward, forward, and sideways. These movements counteract the adverse effects of sedentary posture.

Special corrective exercises should be given in groups according to needs. A child who is free from a particular defect, say flat-footedness, is made squad leader of those who have this defect. Every member of the squad knows his defect, understands the seriousness of perpetuating it, and has a clear understanding of the corrective exercises. Under the direction of the squad leader, the squad goes through its appropriate exercises while other squads, similarly organized, are at work on their corrective measures. Without frequent supervision by teacher or school nurse this plan is doomed. Children should be assigned to the different squads upon recommendation of the school doctor or nurse and should be encouraged to practice the corrective movements at home.

The Follow-Up Activities.—Without a system which applies pressure upon children and parents, insistently and judiciously, remedial measures are usually not taken. The physician

advises a visit to an oculist or aurist as the case demands; a communication is sent to the parents; a checking four weeks later is likely to show that no corrective steps have been taken. Ignorance prompts some parents to neglect the advice; economic pressure and excessive housework keeps better intentioned mothers from fulfilling their obvious duties. Sheer inertia is another factor that must be reckoned with in these situations.

To reap the benefits of the efforts of teachers and school physicians, a follow-up system must be established. Parents must be seen and urged to carry out the directions within a limited time. Here is important work for the school nurse, the visiting teacher, and the teacher in training, who is doing practice teaching. Without systematic and effective follow-up, most of the activities undertaken in the interests of better health become lost motion.

The school nurse, properly trained, may render immeasurable aid in promoting the health program of a school. She can give instruction to teachers in matters of physical inspection, take an active part in planning health instruction, advise teachers in matters relating to their personal well-being, render first aid, visit homes, examine children suspected by teachers, examine absentees returning after illness, do the follow-up work in carrying out the physician's recommendations, instruct parents at mothers' meetings—in a word, undertake the manifold activities for which teachers have neither the preparation nor the time.

It is necessary to draft new qualifications for the school nurse. A competent nurse may not necessarily be a good school nurse. A good school nurse must be an experienced nurse who has made special study of sanitation and of the health problems of children of school age and who has learned the many possibilities of health training in the schools.

Open-Air Classes.—*Their Origin.*—Open-air classes followed the discovery that tuberculosis is best treated by diet and fresh air. The tubercular children of former days who were being saturated with medicines were then given the

advantages of the new cure. The first open-air class was established in 1904, in a forest near the village of Charlottenburg, Germany. The first open-air class in the United States was opened in Providence, R. I., and admitted only tubercular children. Not many months later, New York City established an open-air school for similarly afflicted children on an abandoned ferryboat. It is estimated that in 1914 there were about a million tuberculous children in the United States and that only 1,500 of these were in open-air classes.³ In Boston, there is a legal requirement of one open-window classroom in each new school building.

The Open-Air Class To-day.—Educational authorities soon realized that tuberculous children do not belong in a school. They are patients, not pupils. These sick children are therefore treated in sanatoria. The open-air class is now reserved for the anæmic and the physically subnormal child. To-day open-air classes are found in all parts of the United States.

Types of Open-Air Classes.—There are three kinds of open-air classes. We find, first, *outdoor classes* for children with pulmonary disease. These are established as day camps and sanatoria in mountainous regions. Their pupils are treated as patients first and as pupils second.

For children who were exposed to active tuberculosis in the home or who are "arrested cases" or who are suffering from acute malnutrition, chronic fatigue, or cardiac disease, *open-air classes* are established in parks, on roofs, or on balconies. These spaces have only a covering overhead; they have no walls. On severely inclement days curtains are dropped to cut off the strong wind.

The *open-window class* receives normal pupils as well as those somewhat below normal. A regular classroom is used; windows are kept open and a temperature of about 50 degrees is maintained. In New York City these open-window classes are organized or discontinued at the will of the principal and are supervised by the principal, not by a director of a special department. Needless to say, the classification of pupils and

³ A. T. Burke, "Open-Air Schools," Bulletin of the Extension Division of the University of Indiana, Bloomington, Indiana. Vol 7, No. 7.

modes of supervision differ markedly in the various communities.

The Equipment.—The visitor is at once impressed by the special equipment of the open-air classes. In the winter months children wear specially designed wraps, boots and gloves. They are provided with reclining chairs or cots for rest and sleep periods. Baths, scales, and measuring paraphernalia give evidence of regular medical examination. Cooking facilities, ice box, and tables are used to prepare lunch and mid-morning food. The furniture is movable and the class can be regrouped at a moment's notice.

The Educational Program.—Children in the open-air classes are taught individually or in small groups since many grades are represented in the organization of one class. The size of the class is limited to twenty or thirty and admissions usually take place upon recommendation of the school physician. The curriculum is approximately the same as that pursued in regular classes. In the cold months, instruction is more oral than written. Manual work like gardening is preferred to indoor shop activities. The children usually come as early as half past eight and stay as late as four or half past four.

The Health Program.—The open-air class is inspected by the school doctor or nurse daily in order to help the teacher decide various problems that may arise. Complete family and personal histories are taken, and very thorough medical examinations are made. Children are weighed frequently and hæmoglobin estimates are made at least once a month. Not only is food provided and carefully planned for its nutritive value, but rest or sleep periods are strictly supervised. Each child is regarded as an individual problem. His progress is carefully and fully charted.

Evaluation of the Open-Air Class.—We must approach the problem in a scientific spirit and seek to evaluate, without prepossession, the results of these classes. We ask, "Are they proving worth while physically, scholastically, and morally?"

School authorities give assurance of accelerated gains in weight and height. At the age when normal increase in weight averages six to eight ounces a month, children in the open-

air classes gain twelve to twenty ounces a month. Similarly gratifying gains are made in hæmoglobin count. Figures show that normal children, in indoor classes, who began the school year with a hæmoglobin count of 96 per cent, showed a gradual reduction to about 80 per cent in June, while physically subnormal children in open-air classes who began with an average blood count of 72 per cent attained 85 per cent by the following June. The reports continue favorable: appetite is improved; sleep is more restful; children become more active and tire less readily; fewer children in open-air classes contract respiratory diseases. Beyond doubt, the present program of the open-air classes is a positive agency for the promotion of health among the physically ill-favored children.

The existing evidence of scholastic achievement does not warrant the formulation of a final conclusion concerning the results of instruction. Standardized tests are not used, control groups are not set up, conditions in the open-air classes and in the control group are not made uniform—in short, the data are not sought in a scientific spirit and are not obtained with scientific technique. Thus, one book assures us:

The open-air school has demonstrated that it is possible for sickly children to make as satisfactory progress in a study program of three hours a day as healthy children ordinarily make on a five-hour program.

How can one respect so distorted a statement? Is the ratio of three hours to five hours fair? Why extract all non-academic subjects like drawing, manual work, and play from the program of sickly children and compare the residual three hours with the full five-hour school day of physically normal children? What tests were given? Under what conditions? Not a fact or a figure; nothing but a conclusion based on hope. What we need are facts and figures. We are still waiting for genuine data.

We have just as little reliable information concerning the influence of open-air class routine on conduct. Some tell us with great assurance, "These nervous children develop habits

of self-control." . . . "Incorrigible children become docile and helpful." . . . "Attendance is greatly improved." . . . "Attention is distracted at first by conditions in the open but children soon grow accustomed to them and then give themselves completely to the tasks in hand." Opinion follows opinion. But we have impressions of a contrary character offered by many teachers who insist, "We expect less of these children and of course we are more easily satisfied with what they do." . . . "Classes are smaller and discipline is, hence, casier." . . . "Attention of the group is very difficult to secure because of open-air conditions." . . . "These children begin to expect too much; they want everything done for them. To that extent we demoralize them." We have struggled long, in education, to free ourselves from domination by opinions. Mere impressions acquired with a variety of emotional accompaniments are too capricious to be made the basis for sanctioning or disapproving so vital an educational enterprise as the open-air class.

The Unreliability of Current Data.—A study of open-air classes gives the following statement of their values: ⁴

Reports from various schools all tell the same story. From 75 to 90 per cent of such children attending open-air schools show improvement. . . . The eyes brighten, the step becomes elastic, headaches disappear, studies and play are entered into with more vigor and the whole mental and physical tone is raised. . . . Gain is made in weight—from $\frac{1}{4}$ to $\frac{1}{2}$ lb. each week. The blood gains in hæmoglobin. . . . Teachers say that sniffing disappears, the children have few colds, and never does a contagious disease "go through" a room.

This is typical of the evidence that cannot be accepted. It is no less unscientific than most of the evidence supplied on the value of open-air classes. What is the measure of a bright eye or of an elastic step? Even in matters of weighing children there is no agreement. Some take the weight in indoor clothes but without shoes; others require children to

⁴ A. T. Burke, "Open Air Schools," Bulletin of the Extension Division of the University of Indiana, Bloomington, Indiana, Vol. 7, No. 7, (1923), p. 12.

undress and wear a light, loose-fitting toga. When so simple a fact as a child's weight cannot be accepted without inquiry, how can one base any conclusion on vague opinions?

Another source of error lies in the practice of ascribing all improvement to one factor when many are present and are, at least, of equal potency. In the open-air class we have (a) open air; (b) lower temperature; (c) special diet; (d) rest periods; (e) greater physical comfort; (f) special medical care; (g) small classes and more sympathetic attitude toward children admittedly below normal physically. What justification have we for crediting the improvement exclusively to the open air? How much of the improvement can be traced to added nourishment and to the rest periods?

There are conscientious school people who insist they can obtain results as good physically in an ordinary closed classroom provided food and rest are assured and the mechanical ventilating system is faultless. There are others who object to open-air classes because of drafts and dust. They argue that lack of grading involves serious loss; that the cold of winter is a distracting factor and causes real pain; that physically weak children when segregated and subjected to specially favorable treatment develop an inferiority sense which unfits them for life's struggle even when they have attained full bodily vigor. Shall we give less credence to these doubts and opinions than to those more favorable to open-air classes? If so, why?

Final Conclusions.—Open-air classes must be studied experimentally under conditions approximately scientific. Prejudice and prepossession must be set aside; opinions and impressions must not be permitted to give color to the investigation. We may then obtain facts that will do more than justify, beyond a doubt, the open-air classes for physically subnormal children. We may have data to guide us in planning the physical conditions under which normal and robust youth may be educated. Progress in psychology has been made by a study of those who are mentally abnormal. Equal progress may be achieved through scientific investigation of proper physical conditions under which the physically

weak shall receive their schooling. It is reported⁵ that in New York City, the authorities supervising open-air classes find "cold a decided advantage; . . . no temperature is too low . . . provided children are well protected by clothing. . . . The greatest increase in weight is during the coldest weather. . . . With the first return of warm weather the increase of weight is retarded." If open-airness, low temperature, and rest periods produce a superior type of education for the weak, why not try it on the strong? Large American cities are spending over one hundred million dollars a year for the construction of new school buildings. If the claims made for the open-air class are substantiated, most of the wealth is being turned into what Ruskin happily termed "illth" for it is used to construct wrong classrooms and to perpetuate inferior physical conditions under which succeeding generations are to be educated.

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QUESTIONS FOR DISCUSSION

1. What physical defects in children of school age may be produced by improper school conditions? by improper home conditions?

2. Overzealous regard of parent for the health of the child may develop in the child a feeling of physical inferiority which becomes a permanent handicap. What is meant by a feeling of inferiority? How does it express itself in childhood? How may it become a permanent handicap?

3. Plan a series of ten programs on "Health of School Children" suitable for parents' meetings.

4. Devise a card that may be printed and used by children for self-scoring on matters of personal appearance and health. Compare your score card with others planned by members of your class. Think of (a) items to be included; (b) mode of scoring suitable for children; (c) arrangement of items and scores; (d) possible use of graphs instead of figures or letters.

5. How much of each year during your professional training was devoted to the study of the health of pupils? What studies of children's health may profitably be included in a teacher-training course?

6. What is meant by a control group in conducting a school investigation or experimentation? In what way does the control group help us reach an accurate conclusion? If you were making an inquiry into the worth of open-air classes, what kind of control group would you set up?

CHAPTER V

PHYSICAL DEVELOPMENT THROUGH PLAY, GYMNASTICS, AND ATHLETICS

The program of health education has thus far concerned itself with two groups of activities, those that seek to prevent maldevelopment and those that are designed to correct remediable defects. This chapter treats of the activities that develop bodily strength and stimulate growth—play, gymnastics, and athletics.

General Facts Concerning Growth.—From the standpoint of function, muscles are either *accessory* or *fundamental*. The former are the small muscles that produce movements that require skill. In manual and fine arts, the peripheral or accessory muscles are trained. The fundamental muscles are those involved in all large and comparatively free movements like walking, lifting, running, and pushing. Accessory muscles tend to remain under the control of the higher centers while fundamental muscles, if the action is repeated, tend to take their direction from the lower centers, the spinal cord. Large movements which involve the exercise of fundamental muscles require, therefore, less effort of will than the smaller ones which function in skilled movements.

From fundamental to accessory is the order in which we develop muscle function. It is necessary to provide spontaneous exercise for muscles before making skilled use of them. The child who has repeatedly made the fine coördinating movements in his free play, will achieve better results when he is required to make these or similar movements in his school work. Since play and athletics involve fundamental muscles mainly, they make for mental relaxation.

Bodily growth may be due to increase either in the size of the cells or in their number. We believe, to-day, that

after birth the number of cells in the central nervous system remains almost constant, while those in the rest of the body increase in number. Hence, growth in children is due to an increase in the size of the cells as well as in their number. Larger cells become more effective for they make possible greater expenditures of energy. Exercise that is purposefully and willingly undertaken and nutrition stimulate cell growth and therefore body growth.

Just as soon as organisms, in their development, give evidence of a new power, provision must be made to exercise it. Use is the price of permanence. When sounds become purposeful and somewhat articulate, we encourage the child to speak real words. When legs acquire strength necessary to stand, we provide ready supports so that the year-old infant may grow accustomed to the standing posture. Later, when senses can discriminate stimuli, we teach color and sound so that visual and auditory powers may be stimulated. In the course of time, enough coördination is acquired to enable the child to make graphic representations; we provide crayon and invite the child to draw.

Young children are frequently restless and tire very quickly. These conditions are peculiarities of their growth and indicate the need that they have for rest as well as for activity. There must be a wise alternation of abundance of exercise and restful inactivity. A six-year-old may walk as far in one day as his twelve-year-old brother. The younger child alternates walk with rest; the older, can walk the entire stretch without resting. The latter's stage of growth enables him to endure a strain which is utterly beyond the capacity of the younger child.

Growth of body shows other peculiarities. Each part of the body has its own rate and law of growth. Bones do not grow as rapidly as muscles, nor does the trunk grow at the same rate as the legs. Students are now endeavoring to determine physiological or anatomical age by the rate of ossification in certain parts of the body.

Growth does not proceed at a uniform rate. There are periods of acceleration and others of retardation. If all parts

of the organism grew in the same period, awkwardness of movement in youth would be rather infrequent. But this is not the case. When one part of the body is experiencing a spurt in growth another may be in its period of rest. The result upon any growing individual is obvious. While his new adjustments and coördinations are in the process of forming, his movements are apt to be extremely awkward. Peculiarities of gait, seeming excess of arms and legs, shuffling, noisy walking—these are some of the accompaniments of the irregular rates of growth.

Growth vs. Development.—Two important concepts, physical growth and physical development, must be differentiated. Growth is the result of the inborn impulse to attain the hereditary type. Growth occurs because of the urge to achieve the structure and the function inherent in the germ plasm. Growth is evidence of hereditary determinism. When assured of adequate nutrition, sufficient rest, and freedom from infections, an organism, it seems, must reach its destined limits of growth. Development, on the contrary, is the result of planned activities designed to quicken growth and stimulate potentialities. It is concerned with producing a desired degree of capacity to achieve specific results. Given well planned exercises, we develop that expertness in track events or in wrestling that mere uninfluenced growth does not achieve. Growth brings increase in size and strength. Exercise develops skill in using this raw strength in very specialized forms.

Because the very young child is concentrated impulse to action, its earliest physical education is play. As nerve centers and muscles gain strength and coördinations become more accurate, gymnastics may be added. With the development of the energy necessary for sustained strain, athletics are introduced to supplement gymnastics, which are formal and correctional. Hence we begin with the study of play.

PLAY

The Meaning of the Term "Play."—The word, play, is used very loosely even in education. We hear that actors play, that children play at tending store, that grown men play

chess or billiards, and that athletes train long and vigorously to be fit to play football. Some even write of the "play aspect of good reading."

There is need, therefore, for a more exact definition of the term. Play, in children, may be regarded as a spontaneous indulgence in an activity that is mainly physical. True, grown men play but their play is an expression of many mixed motives, too many of which are decidedly conscious and deliberate. Just as soon as we decide that for health of body or for peace of mind we ought to play, the ensuing activity is, strictly speaking, not play. It is indulging in a profitable pastime. Chess, checkers, billiards are precisely that—pastimes that help us forget our round of cares, not real play. Children, who play at school or at home, are playing. The lad who says to his playmate, "I'll race you to the corner and back" is extending an invitation to play. The little girl who asks her friend, "Want to see who can skip rope longer?" is looking for a partner to play. It is the mental attitude that, in the last analysis, distinguishes play from other activities. If the individual's participation is altogether spontaneous, if it is prompted by a real hunger, if it brings joy at almost every turn—then he is playing.

Nature of Play.—Play, then, is spontaneous and brings the joy that accompanies the satisfaction of an instinctive craving. When it expresses itself, it reveals the true nature of the child far more effectively than the round of regular formal class activities. Watch children at play and you can readily distinguish the impulsive from the controlled, the sly and the mean from the honest and the kind, the selfish from the generous, the cowardly from the courageous, the meek from the aggressive. Play has often been a bond between pupil and teacher. Through the relationship established in supervision of play and in the direction of athletics, teachers have frequently broken down walls of misunderstanding and distrust between pupils and the school.

Instincts Satisfied in Play.—We often speak of the "play instinct" as if there were one instinct that is satisfied in play. Many instincts prompt the child to play. Recent

writers¹ use impulse and instinct as equivalent terms in the hope of combating the old idea that an instinct is definite and specially adapted to achieve a fixed end. The primitive urge to action, implied in the term, impulse, is the distinguishing characteristic of an instinct.

When the child plays, many cravings to action are satisfied. Among these we must list the craving for rhythmic responses, imitation, hunting, construction, self-expression, gregarious living, nurturing, and domination. Play is prompted by a complex of instincts rather than by a single, definite instinct.

Play, Work, and Drudgery Differentiated.—The distinct character of play may be better understood by contrasting it with classroom activities that are decidedly different—work and drudgery. In the interests of clearness and economy, we shall use a tabular comparison.

<i>Ideas Contrasted</i>	<i>Play</i>	<i>Work</i>	<i>Drudgery</i>
1. <i>The End Sought, What Is the Center of Interest?</i>	1. Play is an activity undertaken with no great desire to create something socially necessary. The player selects the activity and is interested essentially in the process.	1. Work is an activity undertaken to achieve a result that is assumed to be socially required. The worker selects the activity and is interested essentially in the end. Professional work implies interest in the process as well as in the end.	1. Drudgery is an activity undertaken because of the overwhelming force of circumstances. The worker is interested in neither the process nor the end; he toils merely to subsist or to meet his obligations to his dependents.
2. <i>Motive That Initiates the activity</i>	2. The governing motive in play is, hence, pleasure.	2. The controlling aim in work is, therefore, to meet a social need by creating those things that are valuable to the worker.	2. The controlling aim is to be rid of the processes as soon as possible.

¹ John Dewey, *Human Nature and Conduct* (Henry Holt & Co., 1922), p. 105.

<i>Ideas Contrasted</i>	<i>Play</i>	<i>Work</i>	<i>Drudgery</i>
3. <i>Emotional and Intellectual Accompaniment</i>	3. Play gives no systematic development of the body. It seeks change and variety of activity.	3. Work, when physical, usually exercises the same set of muscles and produces expertness which consists of a set of skills. It is, therefore, satisfying.	3. In drudgery, there is a monotony of activity which develops no skill. When work does not engage the workers' intelligence, it becomes drudgery.
4. <i>Physical Accompaniment</i>	4. Play uses the surplus energy of the child, the energy that flows freely. If play is continued beyond the point of tiredness it usually becomes work.	4. Work often requires the expenditure of all our available energy and continues, often beyond tiredness, into fatigue.	4. In drudgery, the hostile mental attitude makes continuance in the process painful. Drudgery accelerates the formation of fatigue.
5. <i>Educational Significance</i>	5. Play has far-reaching educational results which are physical, intellectual, and social in nature. These we shall analyze more carefully on the succeeding pages.	5. Work educates the individual. It develops in him a specific type of skill; it gives him knowledge of materials, tools, machinery; it teaches coöperation with others; above all, it reveals, to the intelligent worker, the part that he plays in modern communal living.	5. Drudgery is drudgery because the intelligence it requires is distinctly below that possessed by the individual. As a process it has few, if any, positive educative effects.

Conclusions.—Two significant conclusions must be formulated as a result of this contrast. First, we must dismiss from our minds the old notion that play is a wasteful impulse that needs discouragement. It is through play that the child first senses the seriousness of life. Watch youngsters playing fire-

man or teacher. What is more serious than the attitude they display? What a difference failure in a race makes to children of ten! Is not the remorse of the adolescent who inadvertently causes his team to lose, very real? In terms of adult values, these losses appear insignificant. But to youth, these experiences are so serious that they help mold their personalities.

Play is purposeful. He who has observed the six-year-old child trying to make his tower of blocks stand up, realizes how much purpose there is in play. But the end, once achieved, is soon lost. Blocks are redistributed and the eagerness to attain equilibrium is forgotten. The activity is, therefore, play and not work.

Second, teachers must strive to make class experiences as spontaneous as play or as necessary as work but never as arbitrary and irksome as drudgery. Long has the gospel of compulsion been taught: force children to do what does not interest them and you prepare them to do the unpleasant but unavoidable duties of adult life. Force children and you develop an attitude of submission not unlike that of the drudge who yields lest circumstances overwhelm him. Our analysis revealed drudgery as almost devoid of positive educative influences.

An illustration may make clear the meaning of the expression,—classroom experiences should be as spontaneous as play or as necessary as work. Tabulate the proficiency in arithmetic, reading, and spelling, and the degree of skill in manual work and penmanship, children acquire in playing store under classroom direction. Here is an illustration of learning through experience that is made as spontaneous as play. The course of study prescribed "learning to count by 2's" for children in a first grade. Instead of the monotonous repetitions of 2, 4, 6, 8, the teacher suggested two contests, ball-bouncing and catching for the boys and rope-skipping for the girls. Each successful catch or jump would be given two points. Various children were called upon to perform with ball or rope as the group which they represented counted in concert. The child in front of them was the first to protest when an error

was made. The children acquired the rhythm of 2, 4, 6, 8 . . . 12, 14, 16, . . . 24—but incidentally—as part of a play experience.

But the play motive cannot always be utilized. Under these circumstances, children must be led to understand the social need of the experience about to be presented to them. A teacher of a special class of overage pupils who were staying in school long enough to meet the legal requirements for employment certificates found it difficult to teach local geography. Learning locations of terminals, streets, public buildings, is at best an arduous task. The teacher hit upon a helpful device. She showed the need of this information by making the theme of the oral composition period, "How to answer questions when interviewed by an employer." An advertisement was written on the board. The teacher impersonated the employer, and a designated pupil, the candidate for the position of errand boy. The first applicant was rejected because of poor standing posture and failure to remove his hat upon entrance. The next pupil took care of posture but failed when the employer asked—"If I sent you from here to the Farmers Bank and then to the General Post Office, how many carfares would you need?" The answer showed ignorance of locations and the lad was dismissed with, "You won't do; you don't know your city." The third applicant knew enough to ask for two, not three, fares but when the document to be delivered to the bank was handed to him, he made very ugly fingerprints upon it. He too lost the job and learned the practical value of cleanliness. Posture, appearance, manners, cleanliness, local geography, all took on new aspects. Pleasant or not, they are necessary. The intensified application to these matters gave evidence that the teacher's approach was successful. She made classroom experience as necessary as work. Throughout this text, numerous illustrations will be given of effective motivation.

Playing with Toys.—The younger the child, the more toys he requires for his play. But his older brothers and sisters do not give up their toys. They ask for fewer of them but they demand those that are especially suited to their age.

More than half of the many millions spent annually on toys is undoubtedly wasted. Children derive little pleasure and no benefit from most elaborate and costly toys.

The toy that is so complete and mechanically perfect that it leaves no room for manipulation by the children is not a favorite with them. At all times, a real toy is a thing that can take its place in the changing plans of children; it can be altered; it can serve manifold purposes; it gives the imagination a cue to create a situation that excels by far the toy itself. "Each toy, in its day, should play many parts."

Children soon tire of mechanical toys that are set to perform a fixed stunt. While much skill went into its making, such a toy invites little contribution by the child. How long does a child play with the mechanical rabbit which is wound up to execute six jumps? But a dozen or two cheap wooden animals lend themselves to games of hunting, circus, animal training, and keeping a "zoo." With a half dozen empty cigar boxes and a little string children make trains that haul heavy loads over endless stretches; they set these receptacles afloat and convert the trains into a fleet of ships; they arrange them on imaginary shelves and are ready to tend store. Parents have yet to learn how much genuine pleasure children find in the simple objects that open up a vista of play possibilities. Paint boxes, tool boxes with tools, dolls, bat and ball, skates, marbles, tops, miniature kitchen utensils—these are things that lend themselves to use. They merely start the play process; the children do the playing. But with the over-elaborate toys there really is no opportunity to play.

Age Interests in Play.—Attempts have been made to study the play interests which children exhibit at various ages. The danger of any broad generalization lies in the indefiniteness of the designation, *age*. Two children chronologically eight years old may exhibit a difference of four years mentally and two years physiologically. To what extent specific abilities and personal experiences may have determining effects on a child's play has not yet been adequately established.

With a clear recognition of these difficulties, it may be safe to make a few broad generalizations about children's play interest. Up to the chronological age of seven, both sexes seem to have the same play interests. The best games are those that exercise fundamental muscles and call for rhythmic and imitative responses. Boys and girls may, therefore, use the same play space. From seven to nine, the greater physical resources make possible the introduction of a wider range of games. The dramatic element now seems to heighten the child's pleasure in play.

The period from ten to twelve shows greater individualism. The child is often boastful, intolerant of restraint, not capable of protracted team effort. Lee speaks of this as the "Big Injun" stage. In his egoism, the child is often cruel to younger children and to animals and shows decided preference for those games that give opportunity to demonstrate his special ability.

The child whose age ranges between thirteen and fifteen generally shows extreme loyalty to friend or group—a characteristic usually seen in adolescence. The interest in competitive games is strong for, here, youth finds an opportunity to work for playmates or team. In these years, it is necessary to add games that develop physical endurance and muscular skill and that leave the players richer in self-control, self-negation, leadership, and willingness to recognize duly constituted authority.

In planning the play program, we must consider age interest together with playground conveniences, seasonal opportunities, and the play skill of children.²

Can Play Be Taught and Supervised?—Many who accept the interpretation of play as an inborn hunger, question the possibility of teaching and supervising an activity that is essentially spontaneous. Granting that play is a primary drive, why should we insist that it differs from all other instinctive urges in the matter of modification and redirection?

² For a more detailed account of play interests the reader is referred to Atkinson's pamphlet, *Play for Children in Institutions*. See bibliography at the end of this chapter.

Even if children inherit play impulses, they do not inherit a craving for volley ball. They listen to instruction in matters pertaining to play because new games bring new modes of satisfying the play interests and, therefore, new joys. We must not dominate the play of children in an endeavor to prevent it from becoming too vigorous or restricted to too few in the group. Intelligent and unobtrusive supervision insures the elimination of the gambling spirit, the adjustment of the games to the capacity of the players, and the inculcation of ideals of good sportsmanship.

The Educational Significance of Play.—To play is to grow. Play is, therefore, fraught with educational possibilities for youth. It stimulates the processes of physical, intellectual, and social adjustment.

The Physical Values of Play.—Through play the child exercises every part of its body, accelerates the recuperative processes, and develops coördinated movements that make for grace and skill in action.

Gymnastics will develop muscle and coördinations but in ways different from play. One who becomes expert in a gymnastic movement is never sure that he can utilize this coördination in swimming or running or in an industrial activity. The coördination is artificial and despite its accuracy it may not be capable of being transferred to a practical situation. Here is an analogous situation in arithmetic: Drills may reduce $9 \times 8 = 72$ to habit. Although children may respond with unvarying correctness when asked $9 \times ? = 72$ and $? \times 9 = 72$ they may not be able to tell the cost of 8 books at 9 cents each. Drills in unrelated situations do not insure ability to apply knowledge or skill to practical situations.

Intellectual Stimulation Through Play.—Play does more than stimulate muscle growth. It enriches mind as well. Children play with things and thus acquire the elementary perceptions of size, color, and form. In almost all forms of play, a new environment must be created; the "make believe" gives spirit to the game. Imagination is thus rendered active. Play situations are rich in problems that must be solved.

Games like prisoner's base or wolf, and those like baseball are replete with thought provoking occasions that require immediate attention and the whole mind of each player. Teachers often regard with envy the concentration, the thought, and the rich imagery which children give so readily to their play and so reluctantly to the experiences prescribed by courses of study. In the first seven years of its life, a child learns through play at least as much quantitatively as he does later in his college course.

Social Training Through Play.—In play, the self-centered child receives its first training in socialized conduct. The joy of the game is diminished when children play alone. Much of the pleasure of play comes from competition and coöperation with others. But unless the child is willing to curb his own selfish desires, he cannot play with others. The child of four or five is extremely individualistic; he must be the moving spirit; he resents interference of any kind in his game. Very young children usually play alone with their toys. The games of these children are therefore "unorganized, noncompetitive and noncoöperative." The child of eight or ten is more often found in games with others; he submits to simple rules and lives up to them so that he may enjoy the society of his playmates.

The child of thirteen or fourteen has learned the significance of the rules of the game and willingly yields to them. Games of boys and girls of this age are positively complex with regulations. Such children are usually intolerant of one who violates the rules. This is the period of team playing, in which children sacrifice themselves and their glory for the benefit of the group. The individuating nature is learning to recognize occasions when it must subordinate itself.

The play of pre-adolescents does more than merely develop their social nature; it teaches obedience to sanctioned authority; it gives rise to the social life of the gang. Once a child has established his leadership, obedience is easily secured from the others. Children will often do gladly for their leader what they would consider irksome if demanded by teacher or parent.

This is, therefore, the period of opportunity for teaching the meaning of law and the importance of living within social standards. In the classroom we try to stress these very lessons in ethics, in history, and in literature. But in the end, we create an impression that is vague, for this verbal appeal, however vivid, is in the final analysis an abstraction. In play the need of obedience to law is very concrete; disobedience and disregard of law show their effects in ways that the child not only understands but long remembers.

Well ordered play teaches more. It helps make the child more self-reliant and more coöperative; it develops qualities of leadership; it begets pride in real sportsmanship. Sociologists regard play as an antidote to vice in adults. They tell us that play gives the escape from soul-crushing monotonous routine which is afforded by alcohol or by the excitement incident in serious wrong-doing.

The Origin of Play.—Since the play impulse has so significant a bearing in education, we may well inquire into its probable origin. Students disagree in their theories of causes; each group urges its theory as the complete explanation.

Spencer's Surplus Energy Theory.—Among the first serious conjectures of the origin of play is the theory offered by Spencer. He held that the child's concentrated activity is constantly yearning for expression. The body, in health, produces far more energy than it normally needs; it insures the individual a margin of safety, a surplus to meet the demands in an emergency. Estimates by physiologists have placed the surplus of energy at ten times the amount actually required for normal functioning. "The blood must be oxygenated in order to reduce man below the peril of excessive, explosive, ecstatic, hysterical vigor." To consume this surplus energy, we play. "We play lest we rack to pieces, burn up with too much energy. We play in order to get tired." This theory explains why children play more than older folks, and why the games of the former are more physical than those of the latter. It regards play as a negative or secondary force, and fails to explain the craving for play when we are tired by the round of cares that make up the day. On these occasions, it seems

as if we want to play even though we have no surplus energy to expend.

The Preparatory Theory of Groos.—A more serious explanation of play is formulated by Groos. He urges that play be regarded as a means of developing forms of activity which will be very useful in later years. "Children do not play because they are young; they are young in order that they may play," Groos tells us.

The animal in its playfulness goes through activities which form part of its later serious life. The kitten crouching before the rolling spool, the pup jumping at a stranger in its eagerness to receive some attention, the lion cub playfully pretending ferocity toward its little brother cub—all these are merely practicing in play those activities and reactions in which they must become proficient during later life. Thus the boy in his games plays such things as require hunting, attacking, defending; he drives a team, plays at soldier, fireman or policeman. The girl with her doll plays at being mother, school teacher, or nurse. Play thus becomes a preparation for the life we are to lead in mature years. Such is the theory of Groos, so generally accepted a generation ago.

In its general implications the theory is true. Play gives training for primitive living. Any impulse which produces the physical, intellectual, and social results we ascribe to play makes generous contributions to the preparation of youth for the serious business of living. But just as soon as play is regarded as preparatory for the definite vocations of life we find ourselves in the realm of the fanciful. To limit play, as some of the extravagant disciples of Groos have done, to activities that are intimately related to vocational life is to rob play of its spontaneity and introduce a fatal artificiality.

The games of boys and girls are undoubtedly different. But we overlook the fact that adults have contributed to the establishment of sex differentiation in forms of play. Great astonishment is expressed when we find the little boy of six playing with a doll. He is made to feel that he has done a ludicrous thing. Thereafter, he shuns the doll. Children are imitative and at an early age become unmistakably sex con-

scious; these two facts explain why boys and girls play at the pursuits common to their respective sexes.

The Recreational Theory.—A third explanation maintains that play is only the natural reaction to the seriousness and intensity of life. Its sole aim is to give relief. As an offset to this nerve-strung existence, play comes as the alleviator. Life is very serious to our children, even though we adults dismiss their cares lightly; here lies the origin of the play impulse, the recreational theory maintains. But life is exceedingly grave to the adult, yet he plays least. Society idlers whose days are not filled with nerve-racking problems are constantly seeking diversion. The many grave exceptions which come to mind forbid the universal acceptance of this theory as an explanation of all forms of play. In certain instances it offers a seemingly adequate explanation of play.

Play the Reaction to Idleness.—Lazarus, a German educator, finds that play has its origin in the inveterate aversion which the mind has for idleness. When, therefore, the mind is unoccupied, its very freedom from serious business prompts it to devise sham occupations. These make-believe affairs constitute play. This theory explains the play craving in children and in society idlers but finds itself embarrassed in trying to account for the unmistakable desire for play when we are wearied by the inescapable concerns that regularly confront us. The theory of Lazarus emphasizes a primary principle in discipline, that children must be kept busy lest in search for activity they keep us busy.

Play as Ancestral Work.—Hall formulated a theory which finds ready acceptance by all believers in recapitulation. In their play, children pretend to hunt, to fight hostile hordes, to subdue animals, and to gather many things. In these activities, they are not preparing for their future occupations but recapitulating the serious business in the daily life of our ancestors. But we have yet to prove that hunting, fighting, and hoarding are native reactions and not attitudes and impulses implanted by parents, friends, legendary tales, pictures—in a word, by the factors that make up the child's environment.

Conclusions.—Each of these theories fails because it tries to explain so deep-seated and complex an impulse by a single principle. Much of what each says is true, yet no one contains the whole truth. They serve, nevertheless, an important function, for they all point to the need of emphasizing play in the school curriculum and assuring it an important place in our scheme of physical education. They show us that play, the most sacred right of youth, is part of childhood itself.

One of the tragedies of modern city life is therefore the lack of facilities for play. The child in its attempt to satisfy this craving is constantly coming into conflict with authority; gradually he comes to be regarded as an enemy of adult law and order. City life is organized repression of childhood. It is often merciless in its operation.

In this light the playground movement, which is spreading throughout the country, is most necessary and promising for the children of our land. The Committee on Small Parks in New York, in its report, says: "With a common accord precinct captains attribute the existence of the juvenile rowdiness to the lack of better playgrounds than the streets." The London report reads: "Crime in our large cities is to a great extent simply a question of athletics." A high police official in Philadelphia bears testimony to this fact. "The great enemy of the police is the boy in his endeavor to satisfy the burning desire for play."

In the modern city there is especial need for adequate play provision throughout the entire calendar year. The use of the playground must not be denied children after school hours and on days when school is officially closed. An urban community is shortsighted, indeed, if it shuts its playgrounds on Saturdays and on the days that make up the "vacations." It may be advisable to give children a respite from academic duties but to them all days are play days.

Equally important are the playgrounds for young men and women who are employed in gainful occupations and for adults. Certain well defined tendencies in the conditions of labor of our day make education for leisure absolutely essen-

tial. Large-scale production introduces a degree of specialization amazingly fine but alarmingly mechanizing in its effect upon life. The worker craves recreation to counteract the horrible monotony of this form of labor. His demands for shorter working days have been so successful that the five-day working week is seriously advocated in many influential circles. How will the young and the middle-aged use their leisure? Has the "movie show" become our national recreation? The community must educate for play and must provide ample play facilities or pay an ugly price as the consequence of neglect.

GYMNASTICS

The Characteristics of Gymnastics.—The second means of developing the child physically is through gymnastics. If we set ourselves the task of defining gymnastics we would include three ideas: (a) the movements are directed; (b) the movements are graded; (c) the aim is to achieve harmonious physical development. These ideas blended into a simple sentence give a definition of gymnastics.

It is apparent that in aim and in spirit gymnastics differs markedly from play. A contrast between them, arranged in parallel columns, may bring out the distinctiveness of each.

Play

1. Play is free and spontaneous.

2. It seeks to give pleasure and thus to provide relief through recreation.

3. It draws on the surplus energy that is freely and gladly given. As strain is experienced, play either ceases or becomes work

Gymnastics

1. Gymnastics is consciously directed through the whole process.

2. The aim of gymnastics is to produce a healthy body that is harmoniously developed.

3. Gymnastics must be regarded as work. Reserve energy is used up in achieving a desired state of body development.

4. It lacks gradation. Play that is physical exercises some parts of the body but the benefit is wholly a matter of accident.

4. Gymnastics is thoroughly systematic and well graded. The various exercises are designed to benefit all parts of the body. The movements are graded with reference to the age and physical character of the individual. Children in the early grades are encouraged to breathe deeply; in later grades, to raise arms to shoulder level with each inhalation; in still later years, to raise arms upwards, with each breath. As the child progresses through the grades, more difficult movements are added to intensify the breathing exercises. Each succeeding movement is designed to make a greater demand on muscles and organs.

5. Play is indulged in for its own sake. Such health results as follow from play are incidental.

5. Gymnastics is conditioned by the very definite aim—to achieve health through a rounded physical development.

Conclusion.—This contrast of aims and characteristics reveals the distinctive functions of both play and gymnastics in health education. Throughout the school course the latter must supplement, not supplant the former. We argued, in an earlier discussion, for the continuance of play through the high school and the college years. Valuable as gymnastics may be, its natural limitations make a continuous play program absolutely essential.

Educational Significance of Gymnastics.—*Physical Values.*
—It is commonly assumed by teachers that the outstanding physical value of school gymnastics is the “development of the body.” This is a traditional belief in which they have little real faith, yet they maintain that ten minutes of calisthenic movements performed reluctantly and limited to school days produce harmonious development of the body. If these

exercises were performed willingly, in longer periods, at least twice each day, and every day of the year, one might hope for real muscular development. But under prevailing conditions the class goes through the exercises, often doing little more than lackadaisically fanning the air with outstretched arms.

Classroom calisthenics, properly taught and regularly practiced, may reasonably be expected to help correct postural defects. In our discussion of corrective gymnastics will be found a further treatment of this phase of classroom exercise.

Mental Values.—Gymnastics gives the pupil training in attending to a specific task. A moment's mental wandering brings loss of count and confusion. Sustained attention is necessary.

A second value of calisthenics is as much mental as physical. Coördinations are developed so that muscles obey mind and groups of muscles work together with ease and precision. The body learns to alternate actions and to perform many movements simultaneously. But it must be remembered that the coördinations developed by gymnastics are, as a rule, artificial and not part of the rational and necessary activities of everyday life. What if a pupil has acquired the coördinations in a charging exercise and can alternate the charges, right and left, without an error? Can he use this coördination in rowing, in boxing, in planing a board, or in any common and useful activity?

No other mental value is apparent. Teachers often complain that classroom calisthenics fails to produce the mental relief in pupils that is anticipated. After two hours of mental activity, a regular fifteen-minute physical drill is given. We demand, of course, military response and action in unison. When the child craves for a measure of freedom, we prescribe breathing, stretching, knee-bending—all in count. What the child needs most is movement that is free and spontaneous and unconcerned with time or sequence. What solemn faces one sees as the class is laboriously bending and breathing to the teacher's count. At the end of a physical training period under a "strict disciplinarian," the child is more tired physically and more strained mentally than he was at the

beginning. With the "weak disciplinarian," the strain is considerably reduced. Children assume a certain ease and take a modicum of liberty.

Emphasis here is not on the desirability of weak discipline but on the need for ample play periods in the school day. Play, by completely relieving the mind, intensifies its activity for further class work. The teacher who has absolute control of her class will find it an interesting comparison to study the pupils after a regular fifteen-minute calisthenic drill on one day, and after a three- or five-minute whispering period on the next, when they are allowed to walk about the room, talk to friends, gossip and jest, even as we do. Although the time may be one-third or one-fifth of the calisthenics periods, the complete relief will make children more alive as we begin our next study lesson. For mental relief and an antidote to fatigue we must introduce periods of light play; for the correction of postural defects, gymnastics. To neglect either play or gymnastics entails serious loss to the child.

Social Values.—Much is said by teachers of physical training of the social attitudes inculcated by gymnastics. Young people acquire habits of prompt and unquestioned obedience and complete self-subordination. Working in absolute unison with a large group gives one a group sense that helps in the process of socialization. While we want rational, not blind obedience, we recognize circumstances when instantaneous response to a command is absolutely essential. These may be emergent rather than usual situations but they do arise and children must be trained for them. Whether the obedience and the identification of self with the group in gymnastics will develop attitudes that we can carry over into social and business relations is yet to be proved. Such little data as we have point decidedly to the negative answer.

ATHLETICS

The Status of Modern Athletics.—In the last two decades, athletics has not received the scientific study accorded other educational activities. It is often free from direct and strict

faculty control. In certain institutions athletics has degenerated and has become a menace to developing youth. Gymnastics has been studied, systematized, graded, and allotted definite ends to achieve. But athletics often has neither plan nor well formulated objective.

The faults of modern athletics cannot be ascribed to its youth for it is almost as old as mankind itself. Athletics reached a high degree of development in Greece. It was developed effectively in many of the older countries. Athletics has not outlived its usefulness. Just as soon as there is a clear-cut recognition of the primary function of athletics, we shall have taken a long step in the regeneration of this highest expression of play.

The Nature of Athletics.—*Athletics Defined.*—We may define athletics as a combination of play and gymnastic activities performed for the purpose of winning. Athletics tries to overcome the tedium of formal gymnastics by infusing the elements of competition, emulation, and rivalry so prominent in play. An impelling interest is thus introduced into athletics so that every movement has an unmistakable goal, to win for the team.

The difference between athletics and gymnastics is one of spirit; between athletics and play, one of degree. Gymnastics is made formal, disciplinary, and severe because its aims are the correction of postural defects and the harmonious development of the body. Play, on the contrary, is free and spontaneous. Athletics follows set regulations but it retains the pleasure of play. Athletics may therefore arouse keen disappointment or unbounded joy. It makes adults of youths by infusing an exaggerated seriousness into the results of play activities. It brings back the spirit of youth to adults by causing them to lose themselves in a contest, in which victory or defeat is of no real significance.

Worth of Athletics Questioned.—The relative worth of athletics is rarely discussed calmly. Too often, the contending views are extreme and biased. In recent years a storm of protest has been raised against the manifest abuses of athletics. Nevertheless, athletics is acquiring increasing impor-

tance in all grades of educational institutions. Teachers in the grades are asked to promote the athletic ambitions of their schools as a means of furthering the health education of their pupils. What are the counts in the indictment against athletics? Does it merit the sacrifice in time and energy that teachers are asked to make for it? Shall we follow the earnest advice of certain authorities and make extensive reductions in athletics? Certain unmistakable gains are urged by the devotees of athletics. Before formulating our conclusions, we must examine the rival claims of the contestants.

The Case for Athletics.—*Physical Values.*—It is urged that athletics develops grace of movement, coördination, and the endurance that accompanies health. The body is thus prepared to meet the most rigorous demands of the physical environment.

Intellectual Values.—Athletics demands the whole attention of the participant. Unless he concentrates upon every step in the game, the player may overlook an opportunity for victory. There is no place for the dreamer on the field of sport.

Another desirable mental power cultivated by athletics, it is asserted, is the capacity for rapid and decisive judgment. In athletics, numberless critical situations arise which may bring victory or defeat. There is no time for hesitation and extended deliberation. The player must make his decision at once and support it with the courage that insures instantaneous response. We are constantly reminded that in practical life similar situations present themselves; these are far more significant for they may shape our very destiny. Quick, decisive judgment is necessary. This, we are assured, athletics can bestow.

Social Values.—Much evidence can be presented to prove that athletics develops an institutional sense. In an athletic contest, the good record of the school may be in jeopardy. All the loyalty of the pupils is focused on the outcome of the game. When a nation is in danger, patriotism runs high. In protracted periods of peace persistent effort is required to

keep love of country from becoming dormant. So, too, in the hour of trial, school spirit is aroused. Success or defeat assumes colossal consequences. The fervor of the ruling emotions spreads and all pupils of a school are seized by a common hope of success. Athletics develops school spirit and builds up the tradition peculiar to each institution.

He who cannot make sacrifices for a group, cannot be an athlete. Athletics cannot succeed unless emphasis is laid on team work. When the athletic field becomes an arena for the display of individual skill then failure is inevitable. The glory of victory goes, not to the individual, but to the team. Each player merges his skill with that of his team mates for the greater glory of the school. Enthusiasts tell us that the lessons of self-sacrifice are so deeply impressed, that the athlete carries the spirit of "working for the common good" into all his relations in after-school life.

Athletics, like play, socializes the individual and teaches him the fundamental virtues that constitute good sportsmanship. Youth learns to play fair, to be generous in defeat and humble in victory.

The Case Against Athletics.—We have summed up the values that are commonly ascribed to a rational and well balanced program of athletics. We must now evaluate these claims in the light of actual experience.

Physical Dangers in Current Athletics.—Modern athletics may produce more harm than good by its extreme specialization. Long periods of activity and persistent endeavor to excel existing records produce strain that may leave permanent injury. The specialization often develops a body that lacks proportion. Athletes are frequently ungraceful in movement and highly skilled in coördinations that are of little practical use. What if one can run one hundred yards in less than ten seconds, or if one can do a high jump of more than six feet, or a broad jump of more than twenty-four feet, or can pole-vault higher than any other fellow student? Do these not represent rarely attained degrees of skill in movements that are artificial and utterly unrelated to the needs of life? Many, though inconclusive, studies have been made to show

that the strain of athletics robs outstanding athletes of longevity. Enthusiastic supporters of athletics that "breaks records" seem to forget that athletics is essentially a means of promoting health and insuring proper physical growth. The Greeks never lost sight of this aim. Despite their limited knowledge of physiology they sought to develop, not brute strength, but health and a body of pleasing proportions. They ran their races at night, on courses of sand, and required contestants to carry a torch in each hand. The Athenian cheerfully admitted that maximum speed could not be attained under such conditions but he probably would have argued, "We can run fast enough. We are eager to have our youth display muscles harmoniously developed and bodies under perfect control." The intense training so characteristic of modern athletics is not free from serious danger to health.

Even where athletics is conducted on a moderate scale, how many participants do we find in a given school? Almost invariably, children well developed and with athletic promise are selected for further training. The anæmic, pale-faced, hollow-chested student lustily cheers the great, big, over-developed athlete to victory. Would it not be more in keeping with the aim of athletics to make these two change places? The thought is almost ludicrous in the light of current practices. In athletics, the controlling slogan is, "To him who hath."

Limitations of the Intellectual Gains of Athletics.—If we grant that athletics demands concentration and decisive judgment, we have yet to prove that these two habits of mind can be transferred to experiences other than athletics. Does the athlete show capacity for concentration in studies as a result of his athletic training? Will his judgment be equally good in the professional or business situations that may present themselves in later years? The present findings in psychology prompt a negative answer.

In those colleges in which athletics has grown out of bounds, we find a serious loss of intellectual interests. One associates with the college those intellectual pursuits that help in the search of truth; one thinks of college students as the priv-

ileged few, whose main interest—though, to be sure, not the sole interest—lies in books and in laboratories. What a rude awakening awaits the uninitiated. In many institutions athletics and social functions overshadow the few hours reluctantly given to study. Small wonder that a great scholar in one of our leading universities grew impatient after listening to his colleagues discuss means of stimulating scholarship in the staff, and exclaimed, "I tell you, Mr. President, we shall not have a scholarly faculty until we are rid of the students." Athletics has frequently infused a perverted sense of values in student bodies.

Limitations of the Social Gains of Current Athletics.—We have long taken for granted that the lessons of good sportsmanship learned in athletics will be carried over to all family, social, and business relationships. We have sufficient cause to doubt such a desirable transference of attitude. In our study of formal discipline, we shall discuss the issue with adequate theoretic and experimental data. At this time, we need only recall athletes of our acquaintance and seek evidence of their moral superiority. The search will probably lead us to the tentative conclusion that in nonathletic relations, athletes show the same range of ethical conduct as the general run of mankind.

The outstanding danger in modern athletics is the overwhelming emphasis on winning. When "play to win" becomes the controlling aim, honesty is forgotten, conscience is compromised and the gambling spirit is enthroned.

A casual acquaintance with actual conditions in athletics is disheartening. It is not unusual to find chicanery of every type practiced freely. Paid athletics, "ringers" as they are familiarly called, are sometimes put on a team of an insignificant institution to insure a season of victory. Many reputable colleges have had, until recently, paid "scouts," spies who attended rival institutions and communicated the signals to the college athletic association that hired them. Says an editorial in a leading newspaper: ³

³ *New York Evening Post*, October 6, 1917. An eastern institution is mentioned.

The announcement that the University of . . . has decided to do away with paid "scouting" this year is a reminder of how far some of our colleges have gone. . . . Looked at dispassionately, the custom seems clearly a product of the will to win, not at any cost, perhaps, but at costs that the highest sportsmanship would not be willing to pay.

"Proselyting," undue zeal in influencing promising high-school athletes to come to a particular institution, has become so common as to warrant the National College Athletic Association in devoting a whole session to combat this evil.

No athlete playing on an amateur team may receive pay for his services. The ingenuity of athletic managers discovers many and devious ways of circumventing the well established rule. An institution that kept a basket ball team on a six-weeks' circuit credited each of the players with full attendance for the semester. The cost of maintaining the major sports in a modern university runs into staggering figures. The dean of Harvard, reporting to the President in 1911 when pre-war prices prevailed said, "The cost of organized athletics is almost scandalous. . . . Captains, managers, and coaches . . . tend to encourage and exaggerate fastidiousness in hotel accommodations, in food and clothing; they too often require for themselves and their men luxuries of table and transportation such as none but the rich can afford. . . ." After an enumeration of reckless expenditures, the report continues, "It is things like these . . . that pamper or even pauperize strong men."

Too often, the controlling purpose of athletics seems to be not merely to win, but win at all costs. What college sends representatives to various high schools and preparatory schools to try to secure students who give promise in mathematics or languages or biological studies? No really good high-school athlete need worry about the expense of going to a good college. Offers will be made to him in such numbers that he will truly suffer from an embarrassment of riches.

The colleges are not the only sore spots in athletics. In city school systems that emphasize athletics, one often finds many forms of charlatanism. Falsifying records, sending chil-

dren to Turkish baths to reduce in weight, and teaching children to take every mean and petty advantage of an adversary—while not general practices, are nevertheless among the recorded abuses. Settlements and social service institutions often have even blacker athletic records than schools. The survival of the slickest, might makes right—these are the demoralizing lessons taught to American youth by athletics when “playing to win” is made the final aim.

Remedial Measures.—In some quarters the cry is raised for the elimination of athletics. But what of the genuine values of athletics which make it an educational activity? The measures that may correct abuses in athletics are many. All remedial practices must begin with stressing health and regarding athletics as a factor in health development.

The substitution of interclass for most interschool athletics will do much towards the reclamation of current sport. Confine most of the games within the school itself and at once many participate without the urge to win by fair means or foul. School spirit and class loyalty are aroused and the ideals of sportsmanship are not strained.

Mass athletics in place of team athletics will do much to bestow the benefit of play on a larger part of the school population. Games are played in which groups of fifty are pitted against each other. In some institutions, every student is required to take part in a sport a given number of hours. At first blush, this practice seems to make true the paradox—compulsory pleasure. But the plan works more rationally. Each student selects his sport—long country walks, tennis, handball, swimming, and the like. He may take his exercise on the campus, or, if he is absolutely reliable, wherever he will. The primary purpose is more than to insure active participation in athletics; it is to inculcate a habit of exercise and to teach another mode of using one's leisure. Courage is required to make this change from team to mass athletics.

Faculty and administrative heads of the schools must exercise strict supervision of athletics because they are responsible for the moral character of the students. In some colleges, the athletic association is dominated by the alumni who hold

the purse strings. The recent graduates want to see a winning team play on those occasions when they forsake their offices and clients to visit Alma Mater. They are impatient with a team not in perfect condition and insist on improvement regardless of cost. They take only a passing interest in laboratories, library, or quality of class work for "these are professional matters and must be left in the hands of the faculty." But athletics in a college is also a professional matter; it, too, must be left to professional direction.

And, finally, a new standard must be proclaimed and accepted in the world of sport. The Greeks gave the victory in a wrestling combat, not to the man who threw his opponent, but to the contestant who displayed muscles harmoniously developed and under his absolute control. The fact that both shoulders of a wrestler touched ground, marked the conclusion of the round but did not determine his defeat. Any system, like our own, which requires extensive competition and the attainment of athletic supremacy, fails to meet the primary requirement of a real health measure. The great contest games played among the best known institutions of the land are not indices of the success of the health education at these schools. These games are mere exhibitions by highly trained specialists to amuse a large public. The modern athletic stadium has become like an arena of old and modern athletics is not free from the dangers that attended the old arena activities. Much courage is required to carry out the remedial measures which will elevate athletics and make it a means of developing the body and training the mind through the muscle.

FORMS OF PHYSICAL EDUCATIONAL ACTIVITIES

An interesting classification of the activities that promote health is given in *Health Education*,⁴ a report of distinctive merit in this phase of education.

⁴ Joint Committee on Health Problems in Education, Thomas D. Wood, Chairman, *Health Education* (published by National Education Association and American Medical Association, 1924).

1. Athletics
 - (a) Team games
 - (b) Track and field
2. Ability Tests
Hand stand, long distance walking or running, shooting, etc.
3. Dancing
 - (a) Folk
 - (b) Gymnastic
 - (c) Natural
 - (d) Rhythmic play
4. Group Games
5. Gymnastics
 - (a) Formal
 - (b) Natural
 - (c) Story plays
 - (d) Posture training
 - (e) Individual corrective training
 - (f) Apparatus
6. Stunts

To these may be added:

7. Seasonal Games
 - (a) Winter sports
 - (b) Aquatic sports of the summer
8. Nature Activities
Hunting, fishing, country walks, etc.
9. Combative Activities
Wrestling, boxing, fencing

The classification is not complete but it suggests the great variety of activities at the command of teachers who are striving to secure active pupil participation in some form of health exercises. Every kind of interest can readily be satisfied.

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QUESTIONS FOR DISCUSSION

1. To what extent are gang life, stealing, destroying property, being cruel to animals, etc., only perversions of the play instinct?

2. List the games of boys and of girls. What games do they play in common? How would you explain the apparent sex preferences in matters of games?

3. Boys frequently belong to clubs, block groups, and gangs. The group has a meeting place and a recognized leader. It demands and receives loyalty. It is said that girls do not show preference for group organizations of this type. What explanation can be given for this apparent difference in preference? Discuss the merits of these reasons: girls lack the group loyalty possessed by boys; society sanctions the gang of boys so long as law is not violated but does not sanction the gang of girls; imitation continues gangs of boys.

4. Do animals play? What plan will you follow in discussing this question?

5. What play facilities are provided by your local community and by your state for school children? for adolescents? for adults?

6. List ten games. Show that when these games are played under proper supervision they may develop self-reliance, leadership, capacity for team work, self-subordination.

7. Define gymnastics. List its characteristics and compare it with work.

8. How much of your time in high school was given to (a) play; (b) gymnastics? What was the character of the gymnastics taught you? What changes in time allotment and in content would you make if you had the planning of the physical training activities?

9. "Gymnastics develops fatigue." Outline, as for a ten-minute talk, an exposition of this statement.

10. To what extent is the record a nation makes at an Olympic Contest an index of the health and sport activities in its schools?

11. What characteristic of Greek athletics might well be introduced into modern sports? Why?

12. What reasons may be given in defense of such games as are annually scheduled by the leading colleges and universities for many thousands of spectators?

CHAPTER VI

THE INDIRECT MEANS OF PHYSICAL EDUCATION

The preceding chapters concerned themselves with those activities which lead directly to physical development. Let children play or carry out a program of corrective gymnastics and improved health may reasonably be expected. So, too, physical inspections, medical examinations, and follow-up efforts are bound to raise the health index of children. We listed these activities, therefore, under the direct means of physical education.

There are other health measures that may well be undertaken by the school. These are instruction in hygiene, sex education, and the inculcation of a social sense. We characterize these as indirect measures for they do not give assurance of greater physical efficiency. The pupil may know the laws of hygiene and understand their scientific basis but, like many adults who should know better, he may, nevertheless, continue unhygienic living. Knowledge of the right is merely a guide to conduct; it gives no assurance of action.

THE TEACHING OF HYGIENE

The Teacher as the Class Health Officer.—In our study we indicated how the teacher, through daily inspections, physical examinations, and guidance in the regimen of living plays a significant part in the health education of growing youth. The teacher must at all times be the guide and the example in matters of physical well-being. Through systematic and vital teaching of hygiene, the teacher assumes a more significant rôle in determining the health of pupils. However rich the program of health education, its effectiveness, in the last analysis, is determined by those who carry it out. The teacher is truly a health officer.

Training Teachers As Guardians of Health.—Professional schools charged with the training of teachers, teach how to make pupils proficient in arithmetic and language, how to develop in them motor skills, how to aid them to achieve moral standards. But how little is done to make prospective teachers experts in teaching their pupils the art of healthful living. How many teachers can give to the mothers of their pupils suggestions for improved diet? How many know the fundamentals of the physical care of children? Professional preparation of teachers is too little concerned with health and too much taken up with the technique of teaching the academic subjects. The young teacher is too much concerned with the art of leading young people to accept a heritage they are reluctant to acquire and too little occupied with the business of helping them to live.

The Difficulties Experienced by the School in Health Education.—The school finds discouraging difficulties in health training. These are created, in the main, by social and economic conditions beyond its control.

The most important factors that influence health, namely, food, rest, proper housing, freedom from nerve-wearing anxieties, are directly in the hands of the parents. The school has neither the authority nor the opportunity to shape these conditions directly. Customs that have no hygienic sanction, practices that arise in ignorance, and privations produced by poverty, are determining factors in the health of the child. The problem is further aggravated by the usual indifference of children to matters of health. Health is essentially an adult concern. Children are wont to seek the satisfaction of immediate desires.

Success in Health Education Conditioned by Coöperation with the Home.—The school is doomed to waste its efforts in health education unless it succeeds in establishing a sympathetic coöperation with the home. Children who keep their height-weight charts should be encouraged to show them to their parents. Visiting teachers and school nurses must call at certain homes to make solicitous inquiry about the children and judicious suggestions for improved care. Chil-

dren should be given health projects that must be worked out in the home. A mother should be requested to plan meals, occasionally, with her children; to talk over with them the relative merits of various methods of storing, preserving, and preparing food; to invite them to help in marketing for the family. At meetings of parents' associations, special programs should be planned to give parents the knowledge of child care they so frequently lack.

Aim of Teaching Hygiene.—The primary aim of instruction in hygiene must be to insure better personal and communal health. Facts must be subordinated or stressed depending upon their contribution to this primary purpose. Secondary aims may be listed: inculcation of health habits; stimulating an interest in well-being; increasing efficiency through health; safeguarding happiness that cannot be attained without health. These and other objectives may be enumerated, but they are merely constituents of the fundamental aim—insuring personal and communal health.

The Course of Study in Hygiene.—*Topics That Must Be Subordinated or Eliminated.*—In the light of this governing aim of the teaching of hygiene, it becomes apparent that many of the topics that claim the attention of pupils must be eliminated. Skeletal structure, names and location of muscles, blood vessels, nerves, and the chambers of the heart, are illustrations of the type of anatomical knowledge that pupils may be spared. Children are taught the location of distant mountains, Herbert Spencer complains, but nothing is said of the location of the Eustachian tube. Is it important that children know how to locate Vesuvius or the Rocky Mountains? Such knowledge is socially useful. What if they know the anatomical location of the Eustachian tube or the pituitary gland? What social application can be made of this knowledge? How does this anatomical information help in maintaining better health? For similar reasons, pupils below high-school age need not study the digestive and circulatory processes, and the structure of bone, nerve, and muscle. The aim of the course in hygiene must always determine the content of the lessons to be taught.

What Shall Be Stressed in Hygiene Teaching?—In terms of the standard we formulated, effective teaching of hygiene gives emphasis to the following topics:

The Story of Foods. In telling of milk, dwell on the conditions under which it is produced and protected; the classification into various grades; pasteurization; shipment to urban centers; distribution; milk products; how is health safeguarded; responsibility which rests on milk producers and workers in dairies. Similarly, trace the story of meat, of canned goods, of bread, of fish, of vegetables and fruits, of natural and prepared cereal foods. In every instance, the social responsibility of the unseen army of workers must be stressed.

Food Values. The requirements for effective nutrition. Classes of foods according to their nutritional values. Balanced diets. Planning breakfasts, home lunches, school lunches, picnic lunches, and dinners suitable for pupils in a given class.

First Aid and Home Nursing. Meaning of such terms as sterilization, contagious, infectious, antiseptic, etc. How to sterilize common articles in order to avoid contagion and infection. Care of simple injuries like cuts, bruises, sprains. What to do in common accidents. How to care for patients at home: bed making, feeding and washing of patients, administering of medicines, etc.

The Communication and Prevention of Disease. Most common forms of transmission of disease; preventive measures; an appraisal of the methods of prevention in vogue in the community; hygienic duties of the individual in his home, in his school, on the street, in public conveyances, in an assembly, etc.

Important Physiological Processes. The significance of the circulatory, digestive, excretory, and secretory activities; application to modes of living.

Structure. Only those elements of structure should be studied which justify hygienic habits; for example, knowledge of the structure of teeth reveals the importance of protecting teeth enamel from mechanical injury and decay.

Recreation. Need; when to participate in recreational activities; kinds of recreation and their relative values; undesirable forms of recreation.

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Common Health Dangers. Superstitious fears; unhygienic customs that have sanction in certain social strata; the danger of the patent medicine habit; 95 per cent of the eight hundred million dollars' worth of patent medicines sold in the United States is worthless.

Infant Care. Especially for girls but not limited altogether to them.

Public Sanitation. Agencies that guard health; the water supply; sewage disposal; protecting public against infection.

Industrial Hygiene. The conditions of shop and store that undermine health; how to guard against them; protective measures taken by industry.

Accident Prevention. Extent of preventable accidents; kinds of accidents; methods of prevention; duties of the individuals.

The reader must regard this list, not as a complete and systematic course, but rather as illustrations of vital problems that should make up the course in hygiene.

The Teaching of Hygiene.—*The Lesson Must Be Informal and Intimate.*—Because the fundamental aim in the hygiene lesson is to inculcate a correct attitude towards health and lead to health practices, the appeal must be intimate and personal. Formal teaching may be more effective in amassing facts but it leaves the child cold. He knows but he does not do. Informal teaching that progresses through an intimate socialized exchange of opinions makes an appeal that is emotional and is, therefore, better designed to influence conduct.

Extensive Pupil Participation.—Habit is acquired through action. Health habits are inculcated through active participation in the activities that constitute a health program. Only as the facts of hygiene are applied in the manifold relations of life do they exert their full measure of influence.

There are many means of insuring pupil participation in health activities. First, pupils should be required to keep individual charts of physical progress. Such items as height and weight gains, number of green vegetables in the week's diet, average number of hours of sleep per night, may well

be included. These records stimulate an interest in growth and supply motive for the study of related topics in hygiene.¹

Second, pupils may be encouraged to make drawings and posters on health themes. Children who have little aptitude for graphic representation may cut out appropriate pictures and provide an arresting slogan. They should be required to make diagrammatic summaries of food values of common foods. As typical of these pictorial representations we may mention the following: a milk bottle is outlined and each of four types of shading shows the percentage of fat, protein, sugar, and water, respectively, in milk; the different foods that make up a balanced lunch are outlined, and numbers, appropriately placed, indicate the caloric value of each article of food; under a title, like "Foods Rich in Protein," are placed drawings or cut-outs of the most common protein foods.

Third, pupils should be encouraged to visit food shops and rate them for cleanliness and for their methods of preserving and displaying foods. The class evolves a tabular arrangement of items to be observed and agrees on the relative value to be assigned to each item. The scoring is then made in accordance with the agreed standard.

Fourth, membership in health clubs and in leagues of health will do much to popularize health practices and afford a variety of ways of applying hygienic knowledge. The health committees of a class may be assigned special problems for investigation and report. Thus, committee A studies "The kinds of breakfasts our classmates eat"; committee B, "The games our classmates play; committee C, "The height-weight gains of the members of Class 6A." Each group works out a plan for gathering its data and submits it to the teacher for criticism and approval. It proceeds to collect its facts and drafts a preliminary report which is discussed in conference with the teacher before it is read to the class or distributed in mimeographed form. Excellent projects in hygiene

¹ A helpful personal chart is suggested in the pamphlet by Dorothy Hutchinson, "A Program for Health Teaching in High Schools," U. S. Bureau of Education, Health Education Studies, No. 15 (1923).

and written English that really vitalize instruction are thus evolved.

Fifth, all children should be required to do at least a minimum of cooking and planning of meals. Boys enjoy learning to do simple camp cooking and to prepare luncheons suitable for an all-day hike. Health instruction thus becomes real and children learn "by doing," in accordance with the teaching principle that has earned the sanction of ages.

Health Teaching Through Health Projects.—The preceding discussion suggested real projects that become the center for much useful health knowledge. Larger projects may be planned according to the needs of the community.

A sixth-year class adopted for its project the planning of a campaign for a cleaner neighborhood. Two periods were devoted to the formulation of the activities involved in the project. It was decided to undertake the following:

1. Win Neighborhood Support by,
 - (a) making suitable posters for display in shop windows
 - (b) printing effective slogans and exhibiting these in suitable places
 - (c) writing janitors of apartment houses to secure their cooperation
 - (d) formulating pledges to be signed by all school children
2. Secure Neighborhood Action by,
 - (a) making inspection of streets, garbage collection, and general condition of cleanliness in the district
 - (b) sending reports to the city departments concerned
 - (c) asking the street cleaning department for improvement in matters of sweeping and flushing streets, garbage collection, and placing receptacles for waste in convenient places
 - (d) reporting negligent janitors to central school committee which would send out form letters
 - (e) urging pupils to pick up papers carelessly thrown about

Here are situations requiring active pupil participation in hygiene, oral and written composition, drawing, manual work, civics, ethics, arithmetic, and general science. These subjects, when unified by a central motivating idea, are effectively developed in a genuinely socialized enterprise.

The Use of Textbooks and Printed Material.—The textbook in hygiene should be consulted regularly for the facts required in the solution of problems and for verification of inferences. The study of a class textbook in hygiene, page by page, is usually a most ineffective practice. The topics that follow one another may not arise in the specific health needs of the pupils and may not readily relate themselves to the health problems that are presented by a given class in a particular community. Therefore, children should be encouraged to send for the various pamphlets published by local, state, and federal health departments and by social betterment agencies. These provide a rich storehouse of health facts frequently more effectively presented than the material of the class textbook.

Correlation With Literature.—A correct attitude towards health may be encouraged through correlation with literary studies and dramatizations. Excellent plays on health topics have been prepared for schools. Selected readings from the lives of those who, like Theodore Roosevelt, preached the gospel of health, often popularizes the great outdoors for children whose lives are shut in by the brick and cement of the city.

How to Inculcate a Health Habit.—The stock of habits which children acquire, is the direct measure of the effectiveness of a program of health education. Much intelligently planned health teaching does not culminate in improved health habits because inadequate provision is made for habit inculcation. Care must be exercised to insure at least three conditions.

First, we must provide each child with an *opportunity to participate* in an activity that is intimately related to physical well-being. In the preceding pages we pointed out, at length, specific ways in which children may enter into the hygienic problems of their communities. Active participation in these and similar health situations supplies a motive in health teaching without which habits of right living will not be formed.

Second, each child must be given an *intelligent understanding of health practices* so that he may know their scien-

tific basis. Routine participation too often develops blind habit which gives way when challenged by situations immediately more pleasurable. Ample, appropriate subject matter must therefore be taught so that right living will be rationalized and prompted by genuine conviction.

Third, a routine must be established which makes for regular application of the health facts that were learned. By preparing for regular inspections the child acquires a set of habits of personal cleanliness. Active membership on a school health committee develops correct attitudes towards cleanliness of classroom floor, of desk, and personal belongings. Without this regimen, which tends to establish regular and continuous participation, no habit will form.

Is There Danger in Health Education?—We must give serious consideration to the concern expressed by earnest teachers that while emphasis on health will produce healthy bodies, it may develop unhealthy minds. May not our teaching of causes and prevention of disease, of the dangers of improper diet and inadequate rest lead to health anxiety neuroses? May not stress on health and the causes of ill health produce concern in matters of physical well-being that borders on morbidity? The doubts implied in these queries cannot be dismissed lightly. Fear of taking hold of the strap in a public conveyance, of touching door knobs, of shaking hands with strangers, of eating in restaurants—these are illustrations of disease phobias not uncommon in adolescents and adults.

The mind that is nicely balanced and enjoys emotional stability develops the correct attitudes from proper hygiene lessons and is not upset by the realization that life is an eternal chance. Healthy minds acquire lessons of health, not fear of ill health, from instruction in hygiene. Teachers who are convinced of the importance of health education must therefore constantly stress health, not ill health; they must place less reliance on formal teaching of hygiene and more on pupil participation in such health activities as cooking, supervised recreation, and directed exercise; they should encourage urban children not to submit to the repressions of the city but to seek the liberation of the outdoors in long country

walks, in camping, in fishing, in boating, and in swimming. These are the means by which teachers can give young minds a set in the direction of health.

SEX EDUCATION

Sex Education and Sex Hygiene.—Sex hygiene refers to the body of sex facts that must be given growing boys and girls to enable them to understand their own sex manifestations and to avoid the consequences of improper sex conduct. Sex hygiene is concerned solely with sex health. Sex education refers to the total influences that seek to develop a socially approved attitude towards sex. Sex education draws from many sources for its rich program. It takes liberally from biology, it concerns itself with the ethical basis of sex relations, it includes facts of sex hygiene, it seeks to secure for youth, adequate recreational opportunities—in a word, its chief aim is not mere personal, but social well-being.

Aims of Sex Education.—The scope of sex education indicates clearly that its primary aim is to instil an attitude towards sex that is scientific and respectful. Left to their own resources, young people usually collect, in surreptitious ways, a set of sex beliefs that have no bases of fact and that generate an attitude towards sex that is distinctly disrespectful.

A second aim of sex education is to lead to a clear perception of the ethics that must govern the relations between men and women. Too frequently, sex behavior is taught on the basis of expediency; young people are shown far-reaching physical dangers to themselves in improper sex living. It is well to avoid the unhappiness and distresses of disease but sex conduct must be rooted in forces deeper than mere physiologic expediency.

Another controlling aim of sex education is to teach the social cost of sex promiscuity. Every practicing physician is a repository of a host of gripping tragedies that have their origin in the follies of youth or in the misguided belief that one's sex life is one's private concern. A single telling fact may shake an adolescent out of the smugness of

such a belief. Visit a class of blind children; watch them as they grope about in their helplessness. A startlingly large number of these unfortunates are doomed to a life of eternal blackness because of venereal infection before birth. Surely, an individual's sex life is the deep concern of society, for in matters of sex, as in all other relations, he does not live an insulated life. The innocent pay the grim price of parental folly or ignorance.

The Pivotal Questions in Sex Education.—Theoretically, no parent is unfriendly to any effort to inculcate in his children a correct attitude towards sex. In actual practice relatively few parents or teachers can agree on the program for achieving the much desired end. The first question that divides the camp is, "Who shall be charged with the delicate duties of sex education?" If we make the generous assumption that we have a universally acceptable answer, a second contentious question arises, "When shall sex education begin?" Again, let us assume that a flash of superhuman intelligence indicates a solution that completely satisfies all; at once a new doubt assails us, "What shall be taught?" The field of sex education is as broad as life; what shall be selected? If we were again entirely successful in formulating an answer, we should still have to face almost hopeless disagreement on the solution to the question, "How shall we teach the facts of sex life?" The four questions which give direction to the succeeding discussion are: *Who? When? What? How?* Let us turn to them.

Who Shall Be Charged with the Duties of Sex Education?—School people argue, very frequently, that sex attitudes are so vital and so personal that the parent must assume the full responsibility of sex education; that the teacher-pupil relationship is too formal to hold hope of success; that teachers are too busy with the requirements of an academic curriculum to attempt to guide conduct in matters so far removed from classroom activities.

The parents are often reluctant to accept the burden that is so readily placed on their shoulders. They urge their own inexpertness in teaching and their ignorance of the proper

approach. They insist that those who are professionally trained to teach, should teach.

Frequently, parents and teachers take refuge in the argument that guidance in sex conduct must be turned over to those who are concerned with influencing relationship between man and man, and man and God—to the clergy. But the men of the cloth are as facile as parents and teachers in setting up their claims for exemption from this duty. Thus do parents argue themselves out of their duty.

The inevitable result of this impasse is a conspiracy of silence. The child feels the awakening of sex impulses and seeks knowledge and guidance from those who give it willingly. Too frequently, irresponsible, immature, and ill-informed agents cheerfully step in to take the place of parents, teachers, and ministers. Clearly, parents, teachers, religious leaders, club directors, camp counselors—all those in responsible relationship to youth, must play their part in sex education.

When Shall Sex Education Be Given?—Sex consciousness is exhibited at a very early age. Some authorities insist that sex manifestations occur during infancy. Others advise that this early and little understood evidence of sex be disregarded until the child is seven or eight years old. Physicians cite cases that seem to show that serious and irreparable harm may result from sex practices acquired before the age of seven. It seems idle to fix an age that marks the time when sex education should begin. As sex problems arise, they must be met honestly and intelligently, regardless of chronological age.

It is well to distinguish physiological age from chronological age. If we examined ten children of the same sex, each approximately twelve years old, we would probably find marked discrepancies in their physiological development. Some of these children may be physiologically fifteen years old, while others are physiologically only ten years old. The indices of physiological age are now in the process of formulation. Without the X-ray photograph, it was impossible to study comparative rate of ossification in children. Skeletal

changes, as well as the acquisition and modification of body functions, mark the rate of physiological growth.

We speak of three physiological ages, designated as pre-pubescence, pubescence, and postpubescence, respectively. Once we have accurately delimited the age of pubescence, we have at once the distinguishing characteristics of the other two physiological ages.

Pubescence is marked by accelerated increase in height and weight, by the appearance of body hair, especially pubic hair, by the completion of second dentition, by the awakening of sex impulses, by the decreased activity in certain glands and intensified activity of others, and by the acquisition of the powers of procreation. In the female, far-reaching genito-urinary changes occur. Mentally, we find that emotions become more stabilized. The pubescent does not shed tears over trifling disappointments nor is he transported to Olympian heights at every successful turn in his plans. The attitude towards life is now more rational and gives the pubescent a sense of value that is in closer keeping with the standards of his elders. Terman finds that there is no basis for the time-honored belief that there is a general mental acceleration or retardation during these years of change. More recent studies tend to show that the level of intelligence shows more marked fluctuation during pubescence than in preceding years. These changes, physical and mental, always occur gradually and continuously, as a rule, between the ages of twelve and fifteen.

It seems reasonable, since the prepubescent evinces unmistakable interest in sex, to provide sex education for all three physiological ages. What may be given in each must now be indicated.

What Shall Be Included in Sex Education?—For the pre-pubescent. It is important that nothing be done to quicken the curiosity of the prepubescent in matters of sex. The child should be watched carefully and should be corrected only when parents or teachers have evidence of wrong sex attitude or sex practice. Questions should be answered as fully and frankly as the age of the child permits. The young child

must be told what he honestly wants to know. If parents refuse explanation of those mysteries of life that confound the child, he will persist in his inquiry until his curiosity is appeased. There is grave danger in the information which the child finds for himself. But even graver danger lies in the practice which the child develops of avoiding his parents in his later sex problems. We must answer the questions concerning human life and its reproduction as frankly as we do those that relate to the reproduction of domesticated animals in the home and on the farm.

Attention should be directed to general health, proper nutrition, and adequate rest. Cleanliness and well adjusted clothing will do much to prevent the formation of undesirable sex habits. Insure plenty of vigorous outdoor play. When the body is tired, the mind is usually not concerned with matters of sex.

A systematic and appreciative study of plant and animal life should be made part of the school course. Typical of the topics included are: seed germination; development of stem, root, and leaves; the modes of securing food and sunlight; the formation of pollen; fertilization and cross-fertilization, and the evolution of the seed. A similar functional view of animal life should be provided in the course of study. The aim throughout this study of nature is more æsthetic and inspirational than didactic. While progress is measured by the appreciative attitude that is developed towards plants and animals, the information that is acquired serves as a rational basis for an understanding of human sex life. We hope, in this indirect way, to lead the child to view human reproduction as an incident in the process that is characteristic of all living matter.

For the pubescent. The child who is passing into physiological maturity needs more definite sex instruction. The pubescent should be taught the mode of reproduction in all higher animals and should learn the function and hygiene of the genital organs. Some well informed writers advise that each sex be taught the anatomy and physiology of the sex organs of the opposite sex. To fail to do so, they argue, con-

tinues the mystery of sex and militates against the development of an impersonal attitude towards sex. Their contention has logic but they do not prove their position. By teaching more than is needed in matters of sex, we may stir morbid curiosity and thus aggravate the problem with which growing youth must cope.

An emphasis on the facts of hygiene alone will not meet the full needs of the pubescents. A vigorous ethical and emotional appeal must be continued through pubescence, until the child is brought to a clear realization of the sacredness of the process of human life.

For the postpubescent. The activities of the preceding physiological age must be continued and augmented in post-pubescence. Biology must make its contribution. A study of embryology helps materially in proper orientation in matters of sex. The study of hygiene should include sex hygiene as an important, though not central, topic. A brief treatment of venereal disease is added so that young people may know the dangers, to themselves and to society, inherent in sex promiscuity. And above all, every possible appeal, emotional and intellectual, must be focused on the postpubescents in the hope of bringing them to a realization of the full ethical implications in proper sex living.

How Shall Sex Facts Be Taught?—With our present lack of accurate knowledge of the psychology of sex and of the relation between endocrine glands and personality, there can be no methodology of sex teaching. We grope about, sounding a few cautions, and then sagely advise an approach that is determined by the nature of the individual child. The suggestions for methods of teaching are, at this stage, essentially indirect and negative and altogether empirical.

Individual vs. group teaching. In some institutions, sex facts are taught to a large group in the course in hygiene or health. This practice, it is argued, makes for an impersonal and scientific attitude. Those who need guidance find it in the instruction; the others, learn what may serve them later.

This plan of mass instruction is not favored by all teachers.

Some condemn it because it is too impersonal. One must be physically near his student to reach him spiritually. By presenting everybody's problem, the refutation continues, no one's specific needs are met. Hence, the conclusion is reached, sex guidance should be given to very small groups or to individuals under circumstances that permit the instructor to make a personal and an intimate appeal.

Here are two procedures, diametrically opposed. Each builds on a foundation that seems logical. In the absence of definite evidence no final and conclusive decision can be reached. Out of the endless discussion may come a plan for determining, by an objective test, the validity of the rival claims.

General suggestions. Experience indicates that sex education should be made incidental. Innumerable opportunities present themselves in biology, ethics, civics, literature, history, and geography for a discussion of the correct attitude towards sex. These lessons thus begin in a natural setting and are developed in a rich background of related human experience.

Isolated periods, especially set aside for the purpose of teaching sex, give the child an exaggerated idea of the part sex plays in life. Such instruction makes young people overly self-conscious in matters already too prominent in their minds.

Another practice that is fraught with danger is promiscuous sex warning and attempts to secure approved conduct through fear. Counseling all to avoid bad habits that only a few may have acquired, may suggest to the uninitiated a new form of behavior. Those who have erred are often seized by exaggerated fear of the gruesome consequences vividly portrayed by the misguided mentor. A serious illness neurosis may continue long after the undesirable sex habit has been successfully overcome. The appeal should always be individual and should, in all cases where circumstances permit, be based on motives distinctly higher than fear.

A Possible Danger in Sex Education.—In most relations in life, knowledge is a source of enlightenment. Where it brings genuine conviction, it introduces an urge to correct conduct. Knowledge of sex, unfortunately, does not always produce this

general reaction. It may stir an unhealthy curiosity that borders on morbidity. Young people seem to derive a vicarious pleasure from sex talk. In a small eastern institution, it was the prevailing practice for the college physician to give to the senior class a serious talk on sex behavior before its members left the academic halls to face life's temptations. It is common knowledge that each senior heard this lecture for the fourth time. On the three earlier occasions, he was an uninvited auditor. The pleasure which these young men derived from a repetition of the sex lecture, bespeaks an unhealthy attitude towards sex. Sex instruction stirred, in most of them, sex curiosity and sex morbidity rather than a sex attitude that is scientific, impersonal, and respectful. This observation casts discredit on neither the students nor their instructor; it is cited as evidence that sex knowledge is not necessarily a stimulus to correct behavior.

Sex Attitude a Complex of Attitudes.—The attitude which young people take towards sex is a resultant of many forces that play prominent rôles in their lives. The character of the home, the relations between father and mother, the sex life of older brothers and sisters, the conditions produced by poverty, the forms of recreation, the kind of friends, the physical condition of the individual—these and other factors equally potent, shape the sex attitude and the sex conduct of adolescents. The school exercises its influence, but, at best, it is perhaps the weakest agent in sex guidance.

SUGGESTED READING

ON THE TEACHING OF HEALTH

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- AVERILL, L. A., *Educational Hygiene* (Houghton Mifflin Co., 1926), Chs. ii and iii.
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WOOD and CASSIDY, *The New Physical Education* (The Macmillan Co., 1927).

— — and ROWELL, *Health Through Prevention and Control of Diseases* (World Book Co., 1925). A text to train the teacher health officer of the school.

Pamphlets for Teachers:

Health Education, No. 15, United States Bureau of Education.

Physical Education Series, No. 3, United States Bureau of Education.

School Health Studies, No. 1, United States Bureau of Education.

Pamphlets invaluable for classroom instruction, designed for children, are published by the following organizations:

American Child Health Association, 370 Seventh Avenue, New York City.

American Child Hygiene Association, 532 Seventh Street, N.W., Washington, D. C.

American Medical Association, 535 North Dearborn Street, Chicago, Ill.

American Museum of Natural History, New York City.

American Red Cross, Washington, D. C.

American Social Hygiene Association, 370 Seventh Avenue, New York City.

Boy Scouts of America, 200 Fifth Avenue, New York City.

Bureau of Education, Washington, D. C.

Camp Fire Girls, 31 East 17th Street, New York City.

Children's Bureau, U. S. Department of Labor, Washington, D. C.

Child Welfare League of America, 130 East Twenty-second Street, New York City.

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Girl Scouts, Inc., 670 Lexington Avenue, New York City.

Metropolitan Life Insurance Co., New York City.

National Child Welfare Association, 70 Fifth Avenue, New York City.

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United States Public Health Service, Washington, D. C.

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———, *High Schools and Sex Education* (Government Printing
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booklet.

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Part in Social Hygiene* (525 West 120th Street, New York
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———, *The Problem of Sex Education in Schools*, 1919 (Superin-
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QUESTIONS FOR DISCUSSION

1. What are the laws of your state with respect to compulsory teaching of hygiene?

2. How much time is devoted to health education in your teacher-training course? Do you consider this adequate, insufficient, or excessive? Give reasons.

3. Make a list of at least ten distinct health problems that a teacher must solve in helping pupils to live properly. Do you possess enough information to give your pupils guidance, with confidence, in these matters of health? With respect to one problem that you do not know well, list the kinds of information that you need.

4. Make a list of (a) social and (b) economic conditions in your community that make the task of health education difficult for your school.

5. Evaluate, with reasons, the following topics or questions that may be included in a course in hygiene: (1, means most necessary; 2, necessary; 3, helpful; 4, occasionally useful; 5, least useful but not useless.)

- (a) The traffic rules
- (b) The names of the bones in the arm and forearm
- (c) How to reduce communicability of common colds
- (d) How the water supply is safeguarded
- (e) The Shick and Dick Tests
- (f) Probable causes of cancer
- (g) How to keep perishable foods
- (h) Vitamins
- (i) What to select for lunch
- (j) Do alcohol and nicotine undermine health

6. Plan a health project other than the one referred to in the text. Indicate the mode of approach, the various constituent problems, the pupil activities, and the final conclusion.

7. In a certain class, a good book in hygiene is read regularly. Each pupil called upon reads a succeeding paragraph which the teacher explains carefully. After the day's text is read, a summary of it is evolved and written into notebooks for home study. What is your estimate of this method of teaching health? Do the children learn many facts of hygiene? Does the answer to this last question determine the final worth of this system of instruction?

8. A child shows an inordinate interest in disease, exaggerates every little ache and often feigns minor forms of illness. A competent physician assures the parents that the child is organically

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sound. Name a cause of this attitude that may have its origin in the school; another, that may be traced to the home; a third, that may be attributed to an earlier illness.

9. Ask ten classmates to tell, without disclosing their identity, how they learned the fundamental facts of sex life and animal reproduction. What conclusions for sex education may, with justice, be drawn from the facts disclosed?

10. List as many reasons as you can for justifying the common practice of not giving sex education in public schools. With which do you agree? Justify your disagreement, if any, very fully.

11. What changes, anatomical, physiologic, and mental, may be noted by the time postpubescence is clearly reached?

12. Assume that the school is doing all it can to inculcate a correct attitude toward sex. What conditions in the child's life, social and economic, may thwart the best efforts of the school?

PART III
**EDUCATION AS SOCIAL
ADJUSTMENT**

**A. SOCIALIZING THE CHILD THROUGH THE
CURRICULUM**

CHAPTER VII

THE CHILD AND THE CURRICULUM

The story of life is the story of ever increasing power to make all the adjustments to the environment. Physiology has reënforced this conception by demanding that education provide for the health needs of the individual because the adjustment process is not possible without a struggle with the physical forces of nature. Power to make the social relationships which each individual is to establish in his community, must be developed by education.

The Meaning of Environment.—In an earlier discussion we tried to make clear that the term *adjustment* implies changing the environment—physical, social, and moral—to harmonize with the individual rather than the constant changing of the individual to satisfy the demands of his environment. The term *environment*, thus far undefined, must now be analyzed.

The narrow conception of environment does not see beyond what we commonly call our surroundings. Clearly, education is concerned with things spiritual as well as things physical, and with the past, as well as with the present and with the future.

The new-born child comes into a society rich in artistic and scientific achievements. For these possessions, mankind has paid dearly. They are passed on to each new member of society so that he need not suffer the travail of the race. The complete environment for an individual is, hence, the sum total of all necessary racial experiences. This conception of environment, including the spiritual as well as the material, the past as well as the present, places every child on a higher initial plane than that of his forefathers. Butler has this social conception of education in mind when he speaks of "Adjustment to the spiritual possessions of the race." Others go so

far as to regard education as a process of sharing in the life of the race.

Each generation, then, is the heir of the experiences of its forbears, adds its own to them, and then bequeaths the sum total as a legacy to its successor. Education is the social force which preserves the necessary past, conserves and enriches the present, and prepares the way for a more progressive future. Education, by adjusting the pupil to his complete environment, helps him to relive the experiences of the race, and by reproducing in his own mind, the mind of the race, makes him a rational part of the social body.

Education and Social Adjustment.—Modern society, although artificial, is a living organism with almost as many interrelated functions as the highest product of biologic evolution, the human body. Life, to-day, is an intricate process of living together. Countless thousands secure our foods; a veritable host, in distant lands, produces the stuffs that insure adequate shelter and clothing; a vast army provides means of communication and transportation; an unseen legion safeguards health and life; the gifted of the earth have everywhere perfected their arts that we may be amused and inspired. Who can count the human beings destined to longer and happier life because of the successful outcome of a research problem in a laboratory in one corner of the earth? Yet appalling consequences may result from the misconduct of a single incompetent or dishonest food inspector!

To these social relationships add those of family, friends, church, and state and we have, even then, an inadequate picture of the process of living together. It is clear, therefore, that education must socialize the child. This it hopes to do, first, by teaching the interrelationships in our finely adjusted society; and, second, by introducing activities that prepare for the complicated art of living together.

The Curriculum as a Means of Quickening Social Adjustment.—A curriculum is a body of selected racial experiences designed to stimulate the development of pupils, to acquaint them with necessary knowledge, to develop in them the fundamental skills, and to make clear to them the interrelationships

of modern society. A sound curriculum thus incorporates the individual into his community, and provides him with a form of education in which his individual growth is vitally related to social needs.

Conflict Between Child and Curriculum.—Its social significance gives the curriculum a pivotal place in the education of youth. It follows, therefore, that the curriculum, in its organization, should provide activities and subject matter that utilize the growing and successive capacities of the developing child. The psychology of the child must be the psychology of the curriculum.

Too many existing curricula show no such harmony between themselves and the dominant interests of the pupils. Curricula are the products of adult thought; they have the adult outlook and satisfy adult interests. They approach life with the certainty born of maturity, not with the curiosity and uncertainty of childhood.

Between child and curriculum there are serious discrepancies. The child lives in a world of action and of things; in a world essentially of the present. His life is limited by the experiences of his few years and his meager mental possessions. The curriculum thrusts him into time and space and confronts him with principles that sum up the eternal verities. The six-year-old pupil, in his very first month of school, is taught through sticks or colored ribbons that two three's, three two's, or six one's are six. He is already on the road to the "forty-five or ninety combinations of addition and subtraction." In reading, he is drilled, by cards, to recognize at sight such words as *fight*, *tall*, *rest*, *mat* because each contains a useful phonogram, *ight*, *all*, *est*, *at*. He reads, not to obtain a new and pleasant idea, but to acquire word roots useful in word building. Later, in history, he begins, not with to-day, but with the fifteenth century need for a new route to India and is precipitated into 1492. It may be that these are the only practical modes of approach to racial knowledge but we must, nevertheless, be patient in dealing with the confusion that reigns in the minds of most children, and we must be ready to understand the aversion that so

many have for school learning. Does it not seem reasonable to insist that the teacher, before presenting a new experience, invariably try to discover where the new lesson touches the child's life? At that point of contact, the new lesson must begin. The child yearns for jingles and stories, not for words that contain useful phonograms, hence, reading must begin with rhymes and delightful tales. Similarly, number relations should be learned in making purchases, in keeping score in games, in manual activities, not in counting the teacher's chalk dots on the blackboard.

The second outstanding defect of existing curricula is their failure to recognize how completely integrated is the child's life. To young people, life is one great, big, unified, challenging experience. Curricula present, not life, but a series of separate subjects, which are not infrequently taught as if there were no relationship among them. Even the subject of English is broken up into a number of subjects—reading, composition, spelling, grammar, dictation, and memory selections—each of which is taught without reference to the other. It is not uncommon, in a departmentalized program, to find composition taught by one teacher and language forms and spelling by another. One of our largest cities, engaged in curriculum revision in 1926, assigned the formulation of courses in reading and in literature to two separate committees, each with its own chairman and secretary. Spelling words should be taken from all expressional activities; language lessons should begin in the errors made in written and spoken expressions; the content of reading and composition lessons should bear an intimate relationship to the problems studied in all other subjects.

We insist on clearness of enunciation in the phonetic drills, but we allow slovenly speech in geography and history lessons. Clearness of articulation is sacred in the phonetic drill only. We demand accuracy and precision of speech in the composition periods, but we tolerate looseness of expression in arithmetic, permitting our children to explain, "If three-fifths equals \$9.00, one-fifth equals one-third of \$9.00, or \$3.00." Accuracy and precision of speech seem to be no desiderata

outside of the composition period. The whole curriculum is presented to the child as a mass of straggling bits of information. We fail to bring out the unity of knowledge and its singleness of purpose and aim.¹

A third conflict between child and curriculum has its roots in the fact that subjects are presented in the logical order evolved by an expert. Life, to the child, is not so classified and scientifically systematized. To him, experience follows experience, but the sequence is not governed by fundamental principles.

Let us examine the organization of curricula material.

GEOGRAPHY

The Earth as a Whole: shape, size, circumference, poles, equator, zones.

Surface of Earth:

A. Land:

(a) continents, (b) islands, (c) peninsula, (d) capes

B. Water:

(a) oceans, (b) seas, bays, and gulfs, (c) straits and channels

Names of continents, oceans, largest islands, bays, etc.

Surface of Continent:

A. Land:

(a) mountain chains, (b) peaks, (c) plateaus, (d) plains, etc.

B. Water:

(a) rivers, (b) lakes

GRAMMAR

Language:

A. Kinds:

(a) oral, (b) written

B. Elements:

(a) words, (b) phrases, (c) sentences

Words:

Parts of Speech

¹ For amplification and remedial measures, see Project Teaching, pp. 580ff.

Phrases:

Kinds

Sentences:

A. Form:

(a) simple, (b) complex, (c) compound

B. Elements:

(a) classes, (b) kinds

The adult who is no stranger to geography, sees reason for the arrangement. But to the child, simple experiences are torn out of their place in life and arranged in a system that he does not understand. The very logic of the plan creates for the child a seeming gulf between the curriculum and his life. In the same way, language lessons are real that begin with a study of the child's own sentences and proceed to discover the weaknesses he exhibits when he writes:

I saw him and I invited him to join my team and he said he would.

Hoping to hear soon.

When I saw him on the street.

Again we stress the simple teaching test—does the lesson begin at the point of contact?

Illustrations of the Conflict Between Child and Curriculum.—*A Course in Elementary Physics.*—The outline below gives a summary of a course in elementary physics thoroughly approved by many teachers:

First semester: mechanics of solids, mechanical powers—gravity, levers, wheel and axle, simple machines, etc.

Second semester: mechanics of liquids and gases

Third semester: sound—its phenomena, heat—its phenomena and uses

Fourth semester: light, electricity, and magnetism.

Logic itself. This elementary course begins with a consideration of the forces of matter and their logical classifications and subdivisions into levers, pulley, inclined plane, etc. It proceeds to the less solid matter, liquids, and then to what is even less concrete, gases. Sound and heat, whose more

intangible medium is air, come next in this logical sequence. Then follows a study of light traveling through ether. Magnetism and electricity bring up the rear guard of this most logical and scientific array. This is precisely the arrangement that would be followed by one who sets out to write an elementary textbook on the subject. It is order and sequence which only the more advanced student of the subject can appreciate. In such a course the children talk glibly of "specific gravity, ebullition, liquefaction, propagation, conduction, intensity of light and sound, center of gravity"; but these words are mere sounds which call up their appropriate memorized definitions and the drilled experiments which few can explain.

Where is the "point of contact"? Why not start there? How much better to begin with simple phenomena of electricity and magnetism such as the child sees in his daily life. The magnet affected or produced by a current can be studied by analyzing a house bell. The principles of electricity may not be taught exhaustively, but the children learn enough of them to understand the workings of the bell, the telegraph ticker, and similar apparatus. Let children set up an electric train, find why it fails to run occasionally, why all tracks must be connected by metal parts, and they will learn much that is fundamental in science. Push a lad who stands erect, with feet together, and let the class note how readily he falls over; call upon a classmate to stand with feet apart and now the class is surprised at his ability to withstand the push. Stable and unstable equilibrium are dull things studied in a formalized course. But they are full of interest when the lesson forsakes logical formulation and begins with the life needs of the pupils.

A First-Year Class.—Foundational work is often regarded as inevitably formal. Therefore, many teachers urge that no small part of the class work in the first grade be given over to a round of number lessons, writing drills, phonetic drills, word analysis, phonetic blends, penmanship drills, and the like. Children, the argument continues, should sit still in properly adjusted seats and give sustained attention, otherwise, they

fail to acquire the necessary techniques that are the specialties of the school. We are all too familiar with this type of class work.

Picture a classroom with tables and movable seats. In the rear are five or six work benches each with a complement of the most useful tools—hammer, saw, chisel, ruler, mallet, brace and bit, and the like. To one side, there are five or six easels near a table holding paints and brushes. On the other side of the room is a long table showing various things that interested those who brought them to class. Everything suggests a workroom rather than a place where young people are confined so that they may learn the wisdom of their elders.

The nature of the class project is soon made clear to the visitor. The children are building a little city. Discarded wooden boxes serve as a beginning. Partitions are inserted and additions are made for the roof. It is evident that these boxes are becoming houses with rooms and windows, chimneys, and porches. The windows are curtained, the walls are hung with picture cut-outs and original drawings made by the children. The houses must be painted both inside and out.

But before work on the dwellings is started, streets must be laid out. Where shall the car street be? Where the depot? The railroad station? The post-office? The grocery store, the butcher shop, and the vegetable market? These streets and the houses must be named and numbered; the various stores must be indicated; traffic signs with words like *go*, *stop*, *turn right*, *no parking*, etc., must be made and read. In all this construction work measurements must be taken and number facts must be used. By the time the houses are set up and the town laid out, the children have acquired no small stock of reading symbols and figures. This information is acquired, not through formal teaching but rather by the method that we learn most things when we are not in school.

Now the houses must be peopled. Dolls are dressed and labeled with their permanent names. Simple family relations and obligations are taught, meals are planned, suitable clothing must be prepared for the various seasons, baby dolls must be taught the little songs for their games; lullabies are sung

to tired babies. Lessons in hygiene, in ethics, in diet and personal hygiene are learned by planning the family life of the dolls.

The community activities are then developed. Letters are mailed and distributed to the houses. In the purchase of food at the stores, children learn to read names of all sorts of articles, to add, to make change, to express themselves as clearly as we expect them to do in the formal oral composition lesson. The food supply of the little city must be assured; this leads to a study of the source, distribution, and marketing of foods in a real city. The project can be carried on indefinitely. Some children bring their toy trains and tracks; a railroad is set up and a time-table evolved. The need of lighting is suggested and the town is wired and lit by small bulbs that are connected with dry cell batteries. The children learn to make connections, to distinguish plus and minus poles, to recognize the short "circle" and complete "circle" of electricity—no small number of facts of science.

If we should ask a school superintendent what pupil attainments he expects as a result of first-grade work, he would undoubtedly point to a curriculum and enumerate: number work—counting by one's and two's to one hundred; addition and subtraction combinations; reading—independent recognition of x number of words and y number of phonograms, ability to read simple directions and connected narration; composition—ability to express two successive ideas. He would continue to enumerate hygiene, conduct, manual work, and drawing—until he summarized the prescribed course of his community. If we were to list these formal subject matter achievements and then analyze the outcomes of such purposeful activity as constructing a town, we would find that the two classes of children have probably attained the same amount of factual information, but that the second group has, in addition, a fund of general knowledge and skills as well. But what a difference!—to the former, knowledge is inert stuff mastered by repetition; to the latter, knowledge is that which aids one to meet the problems of life, and is acquired by living intelligently.

SUGGESTED READING

See Suggested Reading at the end of Chapter IX, p. 194.

QUESTIONS FOR DISCUSSION

1. Explain, chiefly through illustrations, the meaning of the expression, *the curriculum, by helping us relive the experiences of the race, makes us a rational part of the social body.*

2. Make a list of your most vital physical, intellectual, recreational, and spiritual needs. Indicate some of the agents that minister to your satisfaction. What conclusion may you draw for education as a result of this analysis?

3. The text says that education hopes to socialize the child through the curriculum and specially designed activities. Why will neither the curriculum nor the special activities prove adequate as sole means of socializing the child?

4. What are the constituent ideas in the definition of a curriculum? In the light of the requirements of a curriculum implied in this definition, evaluate the course of study used in the schools of your community.

5. Evaluate the course of study with which you are most familiar in terms of the following standards:

(a) The child lives in a world of action and of things.

(b) Each subject must begin at the point of contact.

(c) The most persistent needs of industry and commerce must determine the content of the curriculum.

(d) The special characteristics of the age or the place must be revealed in the curriculum.

6. Criticize each of the following teaching procedures, give reasons for your judgment and suggest improvements in those you consider ineffective:

(a) In teaching the Hudson River to children in New York City, the teacher traces the source of the river, then its main stream and tributaries, then its commercial significance, and last the æsthetic aspect (Palisades).

(b) In teaching what part 4 is of 9, the teacher begins by saying: You know how to find $\frac{1}{9}$ of 9, now let us learn how to find what part 3 is of 9.

(c) During the first week, the reading periods of the first grade were devoted to reciting and singing simple nursery rhymes and jingles that accompany games. In the succeeding weeks, the children learned to read some of these rhymes.

7. Give instances in which the curriculum fails to recognize the unity of life. What changes in the organization of the curriculum would correct this fault?

8. What is the difference between a logical and a psychological approach to a topic, say, *longitude and latitude*? Is the psychological procedure illogical? Does the truly logical procedure violate cardinal psychological requirements? Give reasons.

9. List the academic subjects usually taught in the second grade. Formulate a project in the development of which the essence of these academic subjects would be introduced naturally and informally.

CHAPTER VIII

PRINCIPLES GOVERNING THE DEVELOPMENT OF A CURRICULUM

Our discussion of the curriculum, although limited thus far to its functions as a socializing agent, has shown us that it is a delicate instrument that must be shaped with keen regard for all the equities of both the individual and the community. The terms *curriculum* and *courses of study* are used synonymously by some; others employ the former term to mean a syllabus of material to be taught, and the latter, to indicate a refinement of topics together with a discussion of methods of procedure, objectives, and desirable outcomes. The curriculum, let us assume, assigns a study of the military aspects of the Civil War. The course of study suggests the organization of the topic, that is, the campaigns, the battles to be included; the military men and the dates to be remembered; and finally, the lasting gains to the child. For our discussion, no such distinction is necessary because either term, curriculum or course of study, sums up the experiences, the skills, and the attitudes which the school gives the child.

At the outset, we must list the principles, the articles of educational faith, that should control in this significant task of organizing a curriculum. They will determine what material to include, what material to stress, and what material, even though it bear the sanction of the ages, to minimize or exclude.

1. The Culture-Epoch Theory as a Means of Harmonizing the Child and the Curriculum.—In the preceding chapter we pointed out the serious discrepancies that exist at present between child and curriculum, and stressed the teaching principle that demands that each lesson begin at the point of

contact. What principles must we follow in the formulation of the course of study to achieve this much desired harmony between child and curriculum?

An answer to this question was vaguely suggested by Herbart and later elaborated by his disciple Ziller. Their plan is known to us to-day as the *Culture-Epoch Theory* or the *Theory of Recapitulation* and holds that each individual, in his mental development, passes through a series of stages that correspond to the successive stages through which mankind evolved from its non-organized, savage life to its present highly organized, civilized society. "Ontogeny recapitulates phylogeny" is the oft-quoted definition of *The Culture-Epoch Theory*.

This theory is not without biologic parallel. We know that the human fetus, in its prenatal development, assumes forms and structures which suggest humbler animal origins. Various developments occur in the human embryo which are not brought to completion. It seems as if the germ cell, in its eternal life, becomes reminiscent of its earlier amphibious and reptilian existence during the process of producing a human being. So, too, the argument runs, in the postnatal period, we go through earlier social stages. Let us trace the parallel, so oft proclaimed, between individual and social development.

REPUTED STAGES AND THEIR CHARACTERISTICS

SOCIAL EVOLUTION

1. *Savage State. Hunting and Fishing*

Life shows little organization and less social restraint.

Life is essentially fight and play.

The chief concern is to secure food.

Improvidence is evidenced by the lack of concern for the future.

INDIVIDUAL EVOLUTION

1. *Early Childhood to the Age of Six*

The child is extremely individualistic and craves for life that is as free as the wind.

Life is physical, playful, and pugnacious.

The child knows only the present; the future is almost wholly discounted.

The greatest joy is attained

The savage leads a fear-ridden life because of his abysmal ignorance.

2. *Herding Stage*

Man discovers the value of keeping alive surplus of animals caught.

Life is nomadic; the animals lead in their search for food and man follows them.

Pastoral people are highly imaginative because of the richness of their ever-changing environment.

Numerous superstitions and fears beset these people.

3. *Simple Agricultural Stage*

Man now learns the secrets of planting.

He acquires a fixed habitat and is, hence, no longer nomadic.

He looks to the future and provides for it.

Here we find evidence of strong social ties and the beginning of permanent societies.

4. *Simple Handicraft Stage*

Division of labor according to ability and interest now arises.

Intensification of characteristics of stage 3 occurs.

5. *Modern Complex Industrial and Commercial Age*

Intensification of characteristics of stages 3 and 4.

when physical needs are completely satisfied.

2. *Early Prepubescence, Ages 6-10*

The child is extremely nomadic; his imagination carries him far afield.

In day-dreams, he sees himself leader of a pirate or an Indian band. He often threatens to run away from home.

The child lives in great fear of imaginary monsters that come from imaginary places.

3. *Later Prepubescence, 10-13*

Youth now learns the need of a calling.

Selection of life work is usually determined by romantic considerations, hence common desire of children to become nurses, soldiers, etc.

Life now looks to the future.

In games youth now recognizes the need for rules and obeys the leaders approved by the group.

4. *Pubescence, 13-15*

Youth now selects a calling in closer keeping with his abilities and works toward it. He lives in closer agreement with social requirements.

5. *Postpubescence*

Intensification of characteristics of stage 4.

Conclusion from This Analogy.—Followers of the *Culture-Epoch Theory* hold that in the succeeding school years, we

must reproduce each of the culture ages of the race. All of the first grade, for example, should be devoted to a study, so intensive, of the American Indian, that savage life is reconstructed with reasonable completeness. In the second grade, pastoral life must be the theme. The reading, music, oral discussions, manual activities, and the number work must now concern themselves with the activities of the nomad. Year by year, the child comes closer to the age in which he must live. Thus, the story runs, by retracing the stages of social development, the curriculum unfolds itself in complete harmony with the child who is, by his very nature, taking the same path in his own development.

Reputed Advantages of Culture-Epoch Curricula.—The proponents of the theory see many significant gains from such a curriculum. First, the development of the school course is most natural because each social stage is studied at the time when the pupil is in a corresponding stage.

Second, the curriculum shows natural gradation. It does not thrust the child into the complexity of modern life but brings him to our highly interrelated life, step by step, even as he himself grows.

Third, modern life is better understood when seen in contrast with the simple and primitive stages that preceded it. To appreciate the significance of our methods of radio communication, transatlantic transportation, railroad travel, manufacture of an automobile or a fine fabric, we must first become acquainted with the old foot messenger, the viking boats, the ox team, and hand weaving. Those who have always lived on mountain heights do not get the full significance of altitude until they descend into the valley. So, too, with the child. He must see the stages of social evolution in order to understand how far we have progressed.

Fourth, correlation of studies, we are told, is assured through a culture-epoch curriculum. The illustration cited shows how manual work, drawing, reading, number ideas, and oral discussions—the whole array of school activities, are interwoven, for each is only a phase of the culture period under study.

Fallacies and Limitations of Culture-Epoch Theory.—But we must realize that the theory is only a theory with little to uphold it. Such data as research has revealed, tend to deny social evolution through the stages that we have described. As we look over the earth's surface, we find people living in savagery, others engaged in simple agriculture, still others in herding, while various communities are in the handicraft stage or have already evolved a highly specialized mechanical system of manufacture or farming. What does the mind do with these various levels of civilization? It arranges them in the order of seeming complexity: savage life, herding life, hand farming stage, handicraft stage, modern mechanical age—and then infers that all people who have reached the last stage must have taken the long route by passing through the simpler ones. The mind infers that the simpler the stage, the earlier did it occur in time. But inference is not fact, and fact may contradict inference. This is precisely what happens. People have evolved one stage of civilization without necessarily going through those we list as the simpler antecedent ones. The theory is, at best, mere surmise.

Second, the analogy between ontogeny and phylogeny is only verbal and much strained despite our effort to parallel them in tabular form. Is it logical to assume that we cannot ever understand the present without the past? Shall we apply this principle to religious education and insist that the child must be made pagan first or he will never understand the dignity of true Christianity?

Third, the theory lacks psychological sanction. The child of to-day is not necessarily interested in the past. He is fascinated by the aeroplane, the ocean cable, or radio transmission of pictures but not by the foot messengers or ox teams of old. Many of the modern experimental schools spend an inordinate time on Viking boats, Egyptian ships, and the like. These boats are studied from models; they are painted on paper and reproduced in wood. Life on these boats is taken up in detail to obtain an insight into the social organization of earlier centuries. But, early in the study the children grow weary of these ships of antiquity. Give the child

of seven his sand and shovel and his spontaneous creation, we are told, is a cave. The reader is urged to make the test. The prediction here posited is that the child will try to reproduce many things in his surroundings but not a cave. To be interesting, an experience must be of the child's day and of the child's life.

Fourth, the theory when applied to curriculum organization, proves extremely uneconomical. Years are spent building up former civilizations and too little time is left for a study of the life our children are destined to face.

Other objections to the theory may be listed: the correlation is often artificial and so excessive that both pupils and teacher crave a change of subject matter. Much of education based on recapitulation is verbal and promotes, not pupil activity, but endless talk. But enough has been adduced to show us that the *Culture-Epoch Theory* offers no genuine help.

Limited Application of Recapitulation.—Teachers have sometimes made the successive culture stages, centers of reading and manual activity. Instead of making, in one semester, a calendar mount, a toy table and chairs, and a napkin ring, the children study the simple implements of primitive Indians and make bows and arrows, tomahawks, simple pottery, or little rugs. In the next year, the household articles of a pastoral people or a simple agricultural community are shaped. In reading, Hiawatha and Indian life form a center for one term; pastoral life, another. Such work, it is pointed out, is better than the haphazard sequence it supplants. True, but this proves that manual work, developed as a large project, is more effective than a number of unrelated little tasks. Centers other than these cultural epochs may be used with equally good effect. What if in one term children make simple kitchen utensils; in another, toys used for indoor games on rainy days; in a third, toys for outdoor games. These centers are at least as good as the culture epochs and certainly better than a number of objects arbitrarily imposed by the special teacher of manual work.

Thoreau tells us, "The pursuits of earlier generations become sports of later and more highly developed civilizations."

Rosmini, a contemporary of Herbart, believes, "History has the same epochs in the individual as in the whole human race." Baldwin says, "The infant is an embryo person, a social unit in the process of forming, and is, in these early stages, plainly recapitulating the items in the soul history of the race." Goethe expresses the same thought, "Although the world in general advances, the youth must always start again from the beginning, and, as an individual, traverse the world's culture." These conceits, rich in beautiful imagery, are in the poet's province. There they must remain. To apply them to a practical program in education adds to the persistent difficulties, already too numerous, that the school must solve.

2. The Curriculum Material Must Be Highly Motivated.—

Not through a study of culture epoch, but by making the problems of actual life the subject matter of the classroom, may we hope to harmonize child and curriculum. Only as the curriculum studies the processes of actual social living, does it become intensely motivated subject matter for the classroom.

Social need and social use—this is the test that must always be applied to curriculum material. What social need is satisfied by such information as the following: the explorations of the Cabots, De Soto, Balboa, Ponce de Leon, Pizarro? The settlement of Maryland? The Seven Years' War? The Military Campaigns of the War of 1812 and of the Mexican War? The names of the capital and the largest city of each state of the United States? These are old friends, taught by us as they were taught to us. Why should a child in Florida know the capital and the largest city of Nevada? Why should the child in Nevada know that Tallahassee is the capital of Florida and Montpelier on the Winooski the capital of Vermont? The children who recited the exploits of some of the early explorers of the New World had no understanding of the primary election that was going on in their own city. Question children who are doing an example in which material costing four dollars a yard was sold for seven, and you discover that they regard the difference between cost and selling price, as net gain. What if we

can distinguish imperative, indicative, and subjunctive modes? Will speech be improved? The whole curriculum is cluttered up with litter that has remarkable power of survival.

We have made progress in popularizing the idea of social appraisal of the curriculum. Compare the course of study assignments made a few decades ago with those of the present.

*Typical Problems in Old Text*¹

1. A man, when he was married, was three times as old as his wife; after they had lived together 15 years, he was only twice as old. How old was each when they were married?

2. In a mixture of copper, tin, and lead, 36 lbs. more than $\frac{1}{4}$ of the whole was lead; 4 lbs. more than $\frac{1}{8}$ of the whole was copper; and there was as much tin as both lead and copper. How much was there of each kind?

Typical Questions in a Language Test of 1900

1. Give the subject word and predicate word of each of the following sentences.

2. Give three rules for the use of commas.

3. Change the following sentences from what things do, to what is done to things.

Typical Assignment, 1924 (Detroit Course of Study in Arithmetic)

Suppose each child in the room has \$2,000 to invest. Let each child study carefully the different places in which he may invest it, either as a whole or in parts. Make on board a list of the possibilities open, and let each one choose the way he wishes to invest his money. During the period given to this topic, the rate of interest on bonds may vary, the price of real estate may go up or down, rents may vary—children must sell and buy again. Have each one compute net income for a year.

Typical Test of 1926 (Same Grade)

1. Write a short letter of not less than ten sentences, telling the Society for Prevention of Cruelty to Animals of a sick, homeless dog that wanders about in your neighborhood.

2. Cross out the incorrect form and state the reason for your choice.

(a) There (is, are) two of us here.

¹ Research Bulletin of National Education Association, "Keeping Pace With the Advancing Curriculum," Vol. 3, Nos. 4 and 5 (September and November, 1925), pp. 162, 164-165.

4. Analyze the following sentence: The tired army marched over hills and through dales.

(b) (Are, Is) there two more to be served?

(c) One of them (are, is) hurt and must leave the game.

(d) (Hoping, I hope) to hear from you soon, etc.

Spelling Words of Old Eighth-Grade Speller Used in 1900

chirography vicissitude
rectitude penury
mnemonic psychology

Spelling Words in Modern Speller Based on a Study of Actual Correspondence

principle receive
appointment believe
guarantee all right

Typical Factual History in Old Books

New Hampshire was settled next to Massachusetts, by people who came from England. They settled at a place called *Dover*, on the river *Piscataqua*. This was in 1623.

New Jersey was settled next—in 1624. It was settled by people from Norway. The town first begun was called *Bergen*, after a city of that name in Norway. It lies on the *Hudson*, three miles from the city of *New York*.

Questions

1. What state was settled next to Massachusetts? By whom? What place did they settle? On what river? In what year?

2. What state was next settled? In what year? By whom? What town did they settle? How far is this town from *New York*? On what river?

Typical Assignment in History in 1924 (Denver, Colorado)

Unit V—The Westward Movement and Growth of Transportation

General Aim—To help the child experience the life of the explorer and the pioneer, historically, geographically, and socially.

Special Aims—1. To develop an appreciation for the courage and perseverance of the early explorer and pioneer in the conquest of the continent.

2. To show how geographical influences have determined, to a large extent, the lives of people.

3. To show how a transportation system was developed with this great westward movement.

Selected Topics to Be Treated—1. Contrasts between present-day transportation and communication and that of the past.

2. America compared in historical age with other countries.

3. Settlements of the white man.

4. Life of the pioneer.

3. The Curriculum Must Be in Harmony with the Special Character of the Time and the Place.—Because education is usually held responsible for every social maladjustment, we often assume, erroneously, that education formulates, *de novo*, the ideals of a people. In truth, education seeks to perpetuate the controlling ideals of a given time and place. In a society of few citizens and many slaves, public education justifies the institution of slavery. A society that believes in free competition and individual ownership of capital makes sure that capitalism is taught as economically sound. In a communistic society, public education would be expected to thwart every effort to establish private capital and to justify the ownership of the total wealth by the workers. Education, especially public education—is charged with continuing the system that gives it life and support.

In a mining section, the curriculum must introduce in its various subjects—in its geography, history, arithmetic, English, hygiene, and civics—interpretations which explain that specialized environment to the child. The story of coal formation, coal distribution, kinds of coal, money cost of mining coal in various sections, the part coal played and still plays in the development of the country, the human toll it exacts annually, the safety and hygienic measures to protect the workers—these and many more phases of the prevailing industry should be incorporated in the curriculum. In similar manner, appropriate adaptations of curricula must be made to agricultural, to industrial, and to commercial activities of the community. Such a study, apparently specialized, really liberalizes the child. It gives him an intelligent and critical insight into his environment.

Adaptations may be more extensive in certain subjects than has been suggested. If civics is taught primarily to quicken the sense of social obligations, then its content for a rural community must be radically different from that planned for an urban population. Similarly, in hygiene and social sanitation, the fundamental principles may be the same but the applications to city life and to country life make the courses radically different for the two classes of children. Local geog.

raphy for children in congested parts of cities must be different in content from that planned for youngsters in suburbs and even more different for those who come from the farm. Every subject requires similar adaptations.

In a sense, a curriculum is a locally adapted teaching instrument. And yet, necessary as this adaptation is, we must avoid the danger of carrying it too far. All children must be introduced to a life that reaches beyond the limits of their confining experience. The fundamentals in all subjects must, of necessity, be almost the same; the adaptations must be achieved through the applications to the conditions of time and place.

4. The Curriculum Must Be in Harmony with the Teachings of Psychology.—The curriculum is not a mere compendium of knowledge; it is an organization of subject matter prepared for teaching and must be so planned that it follows the approved laws of learning. Let us consider a few of the cardinal lessons of modern psychology and then trace their influence on the curriculum.

Lessons of Modern Psychology *Their Application to Curriculum Making*

1. Self-Expression. The child develops only as it expresses itself.

1. In language, the child grows when it is impelled to express a belief, a desire, or to combat a conviction of others. In music, the child must sing rather than specialize in the study of notes and scales. In drawing, the child must be led to express an idea through lines and forms; lessons on the technique of perspective should grow out of drawings in which the child fails to convey his ideas.

2. Self-Activity. The child learns only as he is an active participant in an experience. An attempt to make the mind a storage of facts, however useful, invariably ends in failure.

2. The curriculum must prescribe a variety of activities. In arithmetic, the child must handle money, make purchases, compute change, measure distances, and learn that two pints make one

The child learns only as he lives through experiences.

quart by using pint-and-quart measures. In geography, the child must collect data from newspapers and magazines and tabulate them to discover the flow of goods from country to country. In science, the child must string his wire and connect his batteries and thus learn, by laboratory procedure, the meaning of complete circuit; mere diagrams are insufficient because a diagram is a collection of symbols that serves the child who has performed the activity. Nature facts are learned by caring for animals and plants, not by studying printed pages and blackboard summaries prepared by the teacher.

3. The Bases of Real Perceptual Experiences. Unless we have real ideas, acquired through contact with life, thinking is loose and inaccurate.

3. To acquire a necessary background for the study of geography, the child must visit many places of industrial and commercial interest. He must see boat landings, factories receiving raw materials and sending out finished products. Through moving pictures, large clay models, and stereopticon views, he must learn basic concepts like coastal plain, plateau, cape, mountain cluster, mountain ridge, river systems, and the like. The child who memorizes scientifically correct definitions of these fundamental geographic forms, utters sounds but has no ideas. Since thought is the perception of a relationship among experiences, it follows that without a knowledge of things, we can see no fundamental relation among them.

4. **Transfer of Training.** We no longer believe that thinking is thinking regardless of the nature of the problem. A person may learn to think in arithmetic, but his thinking in matters of civics, or grammar may be markedly fallacious.

5. **Habit Inculcation.** The aim of all education is to beget proper conduct. But conduct is conditioned by habits of thought and action.

4. The curriculum must provide experience in all subjects which train the child to think. Manual work should be taught, not by requiring children to imitate the processes demonstrated by the teacher but rather by presenting a series of problems, in the solution of which the child learns to recognize mechanical relations. So, too, in domestic science, in hygiene, in civics, in history, or in drawing, the curriculum must require the solution of typical social problems so that the child learns to think in fields as rich and varied as life itself.

5. In every subject the curriculum should list the skills and the habits, the children must acquire. To illustrate: in arithmetic, grade III, "Instantaneous recognition of x combinations in the fundamental operations; habit of checking addition; the habit of asking, 'Is the answer to this problem sensible?'" Similarly, the skills in penmanship, in reading, or in hygiene, must be stated definitely and, where possible, in quantitative terms, so that a teacher may know the outcomes that she may reasonably expect. To say that 3B children, at the end of the grade, shall read silently x number of words of the following text in three minutes and obtain these two ideas, is a quantitative measure of skills, which saves from discouragement the teacher who expects too much and spurs to greater efforts those who are

6. Voluntary Attention to Socially Necessary Tasks. Capacity to work is developed, not by forced attention to a task the social significance of which the child does not see, but rather by the voluntary attention that flows from the recognition of the worth of prescribed experiences.

7. Levels of Intelligence. We recognize not only a wide distribution of intelligence among children but we believe that a child's level of intelligence remains fairly constant. Nothing that education can do will increase intelligence. Much that the school neglects to do is responsible for the failure of children to utilize all the intelligence they possess.

5. The Curriculum Must Be Enriched by Coördinating the Educational Opportunities of the Environment.—We are accustomed to regard the school day as fixed between the limits of a morning hour, say, nine o'clock and an afternoon hour, usually three o'clock. During this stretch of time all children must do all their school learning. After three o'clock, we hope that all will find opportunity to play, to visit the library, to go to places of historic and recreational interest, to attend supervised club meetings held in nearby social

prone to rest content with any degree of pupil effort.

6. The curriculum must begin its subject matter as close to the needs of life as possible. The reader is referred to the previous chapter for illustrations of the kind of organization of subject matter which seeks to reduce the divergences that so frequently exist between child and curriculum.

7. Curricula must be planned for different types of minds. The school must not discourage some children by making exactions beyond their abilities. Nor must it do worse—permit the capable and the gifted to acquire habits of indolence through a course of study entirely too simple. In richness of content and in quality of assignments, the curriculum must approximate the capacities of the individual child. A uniform curriculum for all children is psychologically wrong and morally indefensible. The implications will be developed in the succeeding discussion under the principles of *Flexibility and Adaptability*.

houses, to receive religious instruction, and, if possible, to study music. All of these activities are intensely educational; all socialize the individual.

The traditional school day forces all children into classrooms from nine to three o'clock and leaves all of these additional educational activities to chance during late afternoon and early evening hours. The result, we see, is congestion in school, congestion in the library, congestion in the playground, and congestion in social settlements. Why must all children wait until three o'clock to do their library work or to attend club meetings? What if a pupil wandered into the deserted public library on a school morning? The librarian would undoubtedly telephone the school and the youth would be apprehended and charged with truancy. Why must all children be in school at the same time? Why must all play at the same time? Why must all of these activities be carried on at the peak of the load? Why must the variety of educational facilities of the community remain uncoördinated with the school? Why cannot club, library, playground, music lessons, and educational visits be made part of a larger and richer curriculum?

The Gary or Platoon Schools.—A system of school organization which seeks to carry out the principle suggested is called the Gary Plan, the Double School Plan, or the Platoon School. In 1926, these platoon schools were operating in over 100 cities distributed in about thirty states of the United States.

The essential features of the platoon plan are few and simple:

1. Each school building houses two distinct student bodies or schools known as the X school and the Y school.

2. All the activities we listed above, private music lessons, club meetings, attendance at libraries, free play, and the like are included in the curriculum.

3. The subjects or activities of the curriculum are classed as either (a) regular or (b) special.

The regular subjects consist of arithmetic, reading, composition, geography, history—those usually taught in the classroom by the grade teacher.

In the special subjects are included auditorium programs, special

lessons rich in visual appeal, play, industrial art work of every type, group singing, library work, and visits to neighboring factories, docks, dairies, bakeries, fire houses, police stations, reservoirs, and the like.

4. Rooms for special subjects have special equipment and are planned for large groups. Thus, stereopticon views of typical large cities, of mining operations, of fishing, or of wheat fields may be shown to as many as two hundred sixth-grade children at a time.

5. When pupils of the X school are doing regular classroom work, those in the Y school are in special activities, and vice versa.

A typical day's program may make the organization somewhat clearer:

<i>School X</i>	<i>Schedule</i>	<i>School Y</i>
In classroom	8:45-10:15	In special activities
In special activities	10:15-11:45	In classrooms
Lunch	11:45- 1:00	Lunch
In classrooms	1:00- 2:15	In special activities
In special activities	2:15- 3:30	In classrooms

6. Principals often make their X and Y pupils change programs weekly or fortnightly. For the second week, the X school takes the Y schedule and the Y school the X program. This is done to meet the objection that the X program is more desirable because, under it, the children have class work from 8:45 to 10:15 when they are most rested, and their play and special activities at the end of each session. Under the alternating plan, advantages are distributed equitably.

Difficulties in Platoon School Organization.—The plan cannot be introduced without careful preparation. One does not usually find an adequate number of teachers in a school, who can take charge of large groups and do work that is effective in music, in play, in visual aid lessons, or in auditorium.

Without equipment, the platoon school is doomed. Its shops must be sufficient in number and rich in equipment. The auditorium must have its projection room and projection machinery in perfect condition. Stereopticon slides, films and pictures must be secured in time, and the working materials of the school so stored that they are always available.

Large group instruction requires special preparation that makes serious inroads on the after-school time of teachers. No little labor is required to plan effective auditorium work for a whole semester. Many a platoon plan has broken down

because the teachers were incapable of providing interesting and profitable auditorium activities after the introductory months.

In its early stages, the platoon system thrusts no small administrative burden on the supervisors. Teachers must be trained to work in this new type of organization, they must understand the objects of the plan and must believe in its worth. Children must be taught a new routine. The parents must also be remembered; they must be won over or the schedule will not work. The new type of large group instruction requires close and careful supervision. When all children are in a classroom and each class is under the control of its own teacher, such routine matters as dismissals and fire drills are comparatively simple. But under platoon adjustment, new and more difficult conditions arise that call for foresight and greater expertness.

The platoon system relies much on the neighboring public library, social settlement or church club house, and on the playground. But not all schools have these private and public agencies in their immediate vicinity nor are their supervisors as coöperatively minded as the platoon system always anticipates.

Values That May Follow the Platoon Plan.—It seems reasonable to expect certain gains from the duplicate school organization. First, a large number of pupils can be accommodated and therefore fewer schools will be required. Second, the child's day is markedly enriched by the utilization of many of the community's educational facilities. Third, specialized and better equipment ought to produce better instructional results, especially in such subjects as literature, music, geography, science, and history. Fourth, play is given a dignified place in the school curriculum and is assured the supervision it so often lacks. Fifth, the plan kills the empty slogan, "a seat for every child." Why reserve a seat for the exclusive use of one child? Is a seat reserved for any of us in a theater all the time? Is there any reason why others may not use our theater seats on days when we do not attend the play? Why should other children not occupy our

child's school seat when he is in the pottery class or in the playground, or in the library?

Final Estimate of the Platoon School.—The duplicate school or platoon school presents no new philosophy of education. It is rather a skillful plan of grouping children and activities that promises desirable outcomes. Every curriculum advantage that may be found in the best platoon school can be achieved in a traditionally organized school. But in the platoon school, we have a plan of caring for a large number of children without denying them any advantage that is rightfully theirs. The platoon system may, therefore, give financial relief to large cities that are now faced with financial disability. The experiences of Detroit seem to show that the platoon plan increases the capacity of the building; that it requires fewer teachers for a given number of pupils; that it entails a greater cost for equipment but this is more than offset by the increase in numbers that can be cared for; and finally that the per capita cost of instruction is significantly decreased.²

The vital question is not one of cost but rather of influence on the pupils. We have yet to show that the platoon school is a better place to mold the conduct of youth. Not a few experienced observers carry away disquieting impressions from some platoon schools. They discern in them, the spirit of the factory: they find too much noise and the attention of supervisors directed to the smooth working of the machine for mass production rather than to the happiness of children and teachers. Too often, the school does not seem a place of quiet and repose—a place that invites earnest thinking. But, in justice, it must be observed that these reputed weaknesses are sometimes found in many large schools of the traditional type of organization.

6. Unity and Correlation of Subject Matter.—Earlier in our study, we saw that the curriculum not only breaks down the unity of life, but also presents to the child different and unrelated aspects of what, in reality, is a single experience.

² Official Report, Department of Superintendence, N.E.A., Washington, D.C., Feb. 1926, pp. 131-142.

GROWTH OF THE MODERN ELEMENTARY CURRICULUM

GROUP OF STUDIES	STATUS ABOUT 1875		STATUS ABOUT 1925	
	The Subjects	The Objectives	The Subjects	The Objectives
The Tool Subjects and Sub-jects for Skills	Reading of difficult words Spelling of difficult words Penmanship Arithmetic (very "ruch") Grammar (technical) Drawing Music	Mastery of skills or techniques often studied for their own sake	Reading Spelling (of words selected from actual correspondence) Penmanship Arithmetic (limited to what is socially needed) Language Drills (non-technical) Manual and Vocational Activities	Development of skills or techniques which are most useful in everyday activities. Development of power to do independent work
Factual Sub-jects	Geography (locational) History Natural Science	To acquire facts as facts	Geography (limited number of locations) General Science (physics, chemistry, physiology, and botany)	To acquire the facts which explain common phenomena and experiences of life. Knowledge for social use
Social Studies	Civics, for structure of government Conduct and manners U. S. Constitution	To know facts imposed by social custom	Geography as home of man History as evolution of institutional life	To help child understand his social environment and thus render more effective

GROUP OF STUDIES		STATUS ABOUT 1875		STATUS ABOUT 1925	
	The Subjects	The Objectives	The Subjects	The Objectives	
Social Studies (continued)			Civics for community living Auditorium activities Literature	his socialization	
Health	Physiology and simple anatomy Physical Training	To improve posture and know facts of human body	Laws of Health Health Activities Physical Training Medical Examination Corrective Gymnastics	To acquire health habits through a hygienically approved regimen	
Aesthetic Subjects			Nature Study Literature The Arts: Music Study of Pictures	To develop love for the beautiful and to learn an intelligent use of leisure	
Self-Expression	Oral Language Drawing Music	A mastery of the technical facts of each art	Music Art Oral discussions Written composition Drawing Music Manual Arts	To develop means of self-expression and incidentally to learn the simple technique of these arts.	

The need for a highly integrated course of study is intensified by the recent growth of the curriculum. In the latter part of the eighteenth century, reading, spelling, penmanship, arithmetic, Bible, and catechism constituted the total preacademy studies. The list of subjects has grown incredibly long as the table on pages 164-165 shows.

While the number of subjects has increased so markedly, the time allotted to elementary education has not been extended proportionally. The stream of knowledge is, therefore, wider, and correspondingly more shallow. The remedy lies not in the elimination of new subjects, because each of them was added to meet the new demands of highly socialized living, but rather in the correlation of subjects, in the interrelations of the kindred topics of different subjects until each experience becomes once more a unified living thing.

Let us illustrate. A particular course of study assigns, among other things, the following work in the several subjects for 6B children (sixth grade, second half):

Geography: Chief countries of Europe

History: Important events, 1872 to the present

Arithmetic: Cases of percentage

English: Writing simple expositions like directions, specifications, etc.

What is the usual procedure? The various European countries are taken up in succession as the semester progresses. The history text is followed and the happenings of 1872-1929 are set forth in chronological sequence, but with only incidental or unavoidable reference to the geography of the grade. Since the arithmetic, as commonly taught, never bears any relation to the social studies, why expect it to show any correlation with other subjects in this class? The teacher will search assiduously for suitable themes for oral and written composition but will probably not think of the work of either arithmetic or of the social subjects. In any one week the children may be studying the facts of Italy in geography; the Spanish-American War in history; the method of finding the base or 100 per cent in arithmetic. For composition, the

same children may be writing an exposition on *How to make a doll's dress*, or, *How to lay out a handball court*.

What shall the teacher do who is eager to tie these subjects together? Let her present a real problem or suggest a large project, the solution of which requires much data that is geographic, arithmetic, historic, and linguistic. The pictorial supplement of a Sunday newspaper showed the dignitaries of Japan standing about the grave of a student who had committed suicide because of the affront which his country suffered when "the gentleman's immigration agreement" was set aside and Japanese immigration specifically prohibited. The children agreed that the action taken by the United States must have been a very serious one to lead a young man to make this form of protest. "What did the United States do?" they asked. The teacher explained. The children persisted: "Do we keep out people of all other countries? Do we admit all who want to come in? Then why do we treat Japan differently?"

The questions came thick and fast. The teacher told the children that the answers to their problems require much information and that it could be obtained by a systematic study of immigration. The necessity was clear and the following program was evolved under the guidance of the teacher.

IMMIGRATION

1. Who is admitted to the United States to-day?
2. How many are admitted from each country?
3. Why do so many more want to come?
 - (a) The chief European countries that send us immigrants
 - (b) The conditions in those countries that make their people eager to come here
4. Have we ever admitted larger numbers?
5. Why did we change our immigration policy?
6. Did we treat China and Japan like the other countries in the past? Why?
7. What have the immigrants done for the United States?
8. Why have we never had so many leaving us as seek to leave other countries?

9. What is meant by the expression in our history text: "America is called the great melting-pot"? Is America really a melting-pot?

To answer these questions, the class had to read much of the prescribed geography and history. Certain European countries were located on the map; a knowledge of their physical conditions led to inferences concerning their chief industries; ports of embarkation and lines of travel were traced on the map; inquiries into the previous immigration regulations led to much reading in history and civics; phases of the problem not found in geography or history text, but regarded as very vital, led to a search for facts in reference books. Notes were taken; groups reporting on their assignments spoke eagerly and to the satisfaction of the class. There was reason for speaking to one's classmates and as much reason for listening to them. The discussion of the last topic was especially spirited and showed the results of study. In arithmetic, the class solved examples based on newspaper statements: "With the admission this week of 1,250, the Italians have used up 5 per cent of their quota." What is the Italian quota? How many Italians arrived in 1890, the year on which quotas are based? If this is the average weekly admission of Italians, in how many weeks will they fill their quota?

Here, then, is an illustration of teaching that circumvents one of the weaknesses of a highly artificial curriculum. But why not organize the curriculum so that less skillful teachers can present a whole slice of life and not mere unrelated bits of it?

7. The Curriculum Must Be Adaptable to the Needs of Each Pupil.—Earlier in the discussion, we stressed the need of adapting the curriculum to the needs or the special character of the community. But the individual must be recognized. His personal needs must be served and his specific gifts must be utilized. Each district in a large city shows characteristic deficiencies in language, or in hygienic living, or in understanding of American ideas and ideals—shortcomings against which we must provide. No course of study must be so rigid in or-

ganization that it cannot be adapted, very readily, to the individual needs of the children it serves.

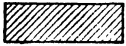


Minimal Courses of Study.—Many devices have been evolved for insuring adaptability. One of these requires the formulation of mere minimal assignments in each subject. Each school is then charged with the duty of planning additional matter according to the needs of its pupils. It is evident, for instance, that the topic, "Proper Selection of Foods," would be applied in different ways in different schools.

The Significance of Unassigned Time.—A second means of making a course of study adaptable is to allow a liberal margin of *unassigned time*. The prescribed course may provide for 240 of the 300 minutes that make up the school day. The local superintendent, the principal, and representative teachers of each school should decide on the disposition to be made of the unprovided sixty minutes. In one school, the unassigned time was given to English and hygiene the first year; to English and penmanship the second year; to English, penmanship, and Americanization the third year; and to English, history, and hygiene the fourth. The judgment of those who know a particular school is thus recognized and additional time is spent where they deem it necessary.

Avoiding an Overprescribed Course of Study.—A third way of securing adaptability is negative in its procedure. The makers of the course of study refrain, most assiduously, from being ultraspecific in their assignment. The teacher of a certain grade is told to teach about three hundred new spelling words but the choice of the spelling list is left entirely to the teacher or the school. Similarly, in composition, the writing of friendly letters, of invitations, and congratulations is one of the prescriptions but the teacher must decide on the specific themes of the letters. To assign, as some courses of study do, the exact subjects for oral and written discussion is repressive of best outcomes that may reasonably be expected. How can any one know what will be the most effective subject of a letter ten weeks hence? A class incident or a school achievement may supply the very occasion that will stimulate self-expression. Assignments like the following unduly restrict

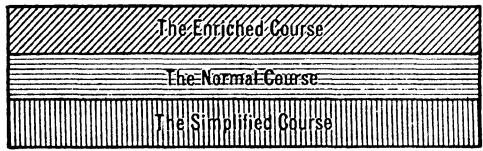
the freedom of choice which the teacher should exercise: "In the Civil War teach the following campaigns and require the learning of the battles and dates tabulated below." The practice of making minute assignments such as these is responsible for highly uncorrelated curricula. It encourages humdrum teaching and learning memoriter.

The Junior High-School Idea—An effective instrument for achieving a high degree of adaptability is afforded by the junior high school which challenges the worth of our traditional organization of an eight-year elementary-school course and the four-year high-school course. The junior high school seeks rather to establish a triple organization of 6—3—3, elementary school, six years; junior high school, three years; secondary school, three years. We must be ever mindful that a mere consolidation of the last two years of the elementary school with the freshman year of the high school does not constitute a junior high school. Such a grouping has administrative advantages: instructors teaching ninth-year pupils receive less pay than those in a regular four-year high school; congestion in the first year of high school is reduced; the pupil who is destined to drop out of school before long may be encouraged to continue his studies for another year. But, despite these values, this fusion of grades VII, VIII, and IX does not make a junior high school. There is something distinctive and more significant in a real junior high school.

The Organization of the 6—²—3 Plan.—In the chart the reorganized system of education that includes the junior high school is presented diagrammatically. We note first the common six-year course that is given to all children to develop the most necessary facts and skills. This course is planned for three types of children; the superior, the average, and the slow. The six-year course indicated thus,  is enriched so that the superior child digs deeper in the field of knowledge; the course indicated thus,  is for the average child and includes approximately what is taught in the first six grades of existing schools; the course designated thus,  is simplified for those whose learning rate is retarded and who must therefore be taught less.

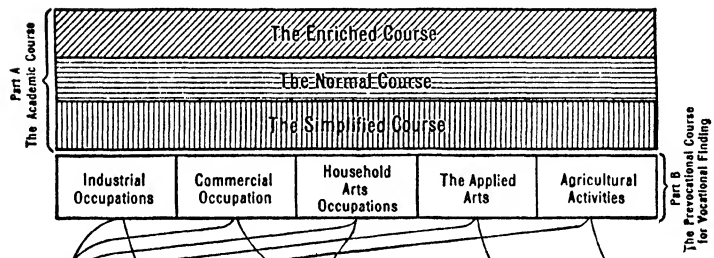
The junior high school, planned as a a three-year course, forms the next stage in education. Here the child is given the approved academic work of grades VII, VIII, and IX.

STAGE I. 6 YEARS
The Common Basis



STAGE II. THE JUNIOR HIGH SCHOOL. 3 YEARS

The Period of { Differentiation not Specialization
Vocational Finding not Vocational Preparation.



STAGE III. THE SECONDARY SCHOOL AND THE VOCATIONAL SCHOOL.
3 YEARS OR LESS (Open Sections Indicate Period Less Than 3 Years)
The Period of Vocational Training and Specialization.

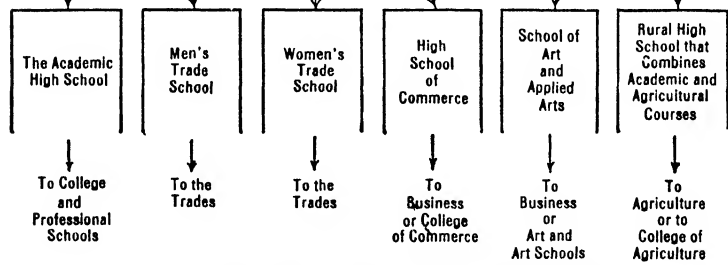


FIG. 2. THE REORGANIZED PLAN OF EDUCATION

While the content of the academic curriculum is not altered, the organization of the course is somewhat different. Foreign language is begun before the ninth year; the advanced

arithmetic of grades VII and VIII is integrated with the algebra or geometry of grade IX and the child receives a unified course in elementary mathematics that is rich in applications to industrial, commercial, or agricultural activities. In as many ways as possible the marked change in method and content of instruction between grades VIII and IX is reduced. As in the preceding stage, the course is graded to the varying abilities of three levels of pupils.

The distinctive function of the junior high school lies in its systematic attempt to discover the capacities and aptitudes of the pupils. To the academic work is added a variety of vocational experiences. The child is assigned, after conference with teachers and parents, to one of the prevocational courses: industrial, commercial, household arts, arts, or agricultural. The industrial prevocational course consists of four or more distinct lines of work—cabinet making, electric wiring, plumbing, tin-smithing, tool making, and the like. A pupil assigned to the industrial group takes the full academic work, and in lieu of his manual work and drawing, two periods a day in one of the shops. At the end of the semester or year, the pupil is sent to another shop, even though he may be loath to give up his initial trade experience. Specialization is not permitted. The object is to study the pupil in as many industrial activities as possible. At the end of a year's work, the school may decide that the child's manual powers show little promise and consequently transfers the pupil to the commercial course. Or, on the contrary, the child may show manual ability of a higher order and he is, therefore, sent to the drafting or tool-making class. The academic work of a pupil may be good and his manual work rather poor. Such a pupil would be given his try-out in the commercial group. After a year in the household arts course, it may seem wise to assign the pupil to the arts group and give work in applied art. At the end of every term or every year, the child's work is evaluated in the attempt to discover limitations and distinctive ability. The junior high school avoids specialization; it stresses differentiation of courses in the hope of accurately gauging human promise. The junior high school

carefully avoids vocational education; it gives only prevocational experiences—mere introductions to trades—in the firm belief that abilities are best disclosed in actual contacts with life and materials.

What shall be done with the child at the end of the junior high-school course? The question should never be answered solely in terms of the parents' wishes but with a full knowledge of the pupil's academic and prevocational achievement. A parent may ask that his child be sent to the academic high school. The school shows that this pupil has a bare passing grade in the major academic subjects; a grade no higher in the prevocational commercial activities, a better record in the household arts of low skill after failure in the more skilled manual work that is creative. Shall this child be sent to an academic high school where failure is almost certain? May not failure in the high school develop a permanent sense of inferiority with its attending lack of confidence that will prevent the child from ever carrying any undertaking to a successful termination? Under the plan outlined above, the school is in possession of records—real records of real performance—and can give advice that is sound and not based on the personal judgment of a teacher or a principal.

Another parent may be eager to send his daughter to the girls' trade school. The school may show a record of very successful academic work, of exceptional achievement in graphic art and may, therefore, urge upon the parent the wisdom of sending the girl to a high school which will permit her to specialize in drawing and, later, in costume designing. Again, the school is basing its recommendation on the child's actual achievement in a highly differentiated program, and not on mere personal opinion.

The academic senior high school is open to the graduates of any of the prevocational junior high-school courses, for these pupils have all had the required academic preparation. Those who are going into industry or business now enter the appropriate vocational schools, and pursue regular courses in sequence for a year or more depending on the degree of skill

required in the chosen field. These schools give specialized, not differentiated, training and seek to produce young people vocationally educated for their chosen work.

Advantages of the 6—3—3 Plan with a Genuine Junior High School.—The educational organization outlined in the accompanying diagram possesses a high degree of flexibility. Despite its rich prevocational training, it establishes adequate safeguards so that no child is sent into a definite occupation at too early an age, nor will the academically minded be retarded in their studies. On the contrary, the superior child, headed towards college, will find his preparatory work in the high school enriched by contact with tools and materials of four or six trades. The experiences gained in solving the difficulties in the tin shop, in the tool-making shop, and in the drafting room, give added meaning to high-school and college mathematics and physics and develop highly desirable manual skill which will be of good service, alike to the physician, to the dentist, to the engineer, and to the laboratory technician.

To these two gains, flexibility and enrichment, we may add others. Continuous secondary education is provided in place of the old system with its serious gap between elementary and secondary school. The small classes and individualized instruction resulting from the differentiated program is a fourth value. Fifth, we must urge that this plan forces school authorities to recognize individual differences and provides a practical plan of offering educational facilities that are in close harmony with natural gifts.

The school can, under such a system, hope to discharge its function of guiding each child vocationally according to ability. In a well planned junior high-school program, there should be four stages similar to those prescribed in the Pennsylvania program of 1922:

(a) Adjustment of the pupil to the new curriculum in the first half of the seventh year. Electives should be few.

(b) Exploration and preview. Short try-out courses are introduced in the second half of the seventh year and the first half of the eighth.

(c) Provisional electives beginning in the second half of the eighth year.

(d) Stimulation to further study and transition to the senior high school in the ninth year.

Seeming Limitations of the Junior High School.—It is urged that junior high schools are expensive because they make necessary a comparatively elaborate equipment and also a higher grade of teacher. That a junior high school is immediately more expensive than the old grades VII, VIII, and IX, no one can deny. But who can estimate the saving to society that is attributed to the discovery of individual aptitudes and to the successful vocational training that is in thorough keeping with individual ability? Who can compute the human cost and the financial waste of a system that perpetuates countless thousands of vocational misfits, shifting from trade to trade, always unhappy, and rarely performing their tasks with good will and competence? No other activity offers society a larger return on its money investment than a properly directed educational system.

Second, it is feared that specialization may begin too early. But specialization, in preparation for modern life, cannot be avoided. Under the plan as outlined, the child cannot begin his specialization before the end of the junior high school. Specialization at too young an age, is very effectively prevented under the proposed scheme.

A third objection is that seventh-grade children are too young to be subjected to departmentalized instruction. But here is a fear not based on fact. As a rule, the traditional eight-year school introduces departmentalized teaching in grade VII. Where the subjects are not over departmentalized, the possible disadvantage of having more than a single teacher is counteracted by the more thorough preparation which she can make and by the specialized equipment which the school can supply.

Two other reasons against the proposed plan seem more sound than those cited previously. We are told that adequately differentiated subject matter has not yet been devised for the junior high school. While all the children should

receive substantially the same academic training in mathematics and English, it is necessary to provide those in the industrial group with mathematical applications that are very different from those given to children in the commercial group. Similarly extensive adaptations must be made in English and in certain phases of hygiene and civics. While satisfactory subject matter is still to be worked out, intelligent application to the task will yield curriculum material decidedly superior to the material now taught in the undifferentiated grades VII, VIII, and IX.

The real retarding factor in the development of the junior high school is the inability to obtain a sufficient number of industrial art teachers who have adequate training and the right kind of experience. We can find artisans who are skillful and versed in the practices of their craft but they are strangers to the meaning of real teaching. They are ready to show children how to do things but not to educate them. We can find many teachers academically well trained and very effective in the classroom, but they do not know vocational needs and cannot make applications that are genuine. Here is a problem that requires social foresight and a generous public purse,—a problem that time and constructive planning will solve.

8. The Curriculum Must Be Made Flexible to Meet the Varying Degrees of Ability.—It was the custom to urge teachers to follow the rule of the navy, "The fleet must proceed at the rate of the slowest moving vessel." The practice may have naval value but it leads to gross injustice when applied to teaching. Usually a class contains children who differ markedly in native capacity. Some may have a degree of intelligence equaled by only one in every 1,000 unselected children; many are just average; others, though decidedly not feeble-minded, are mentally slow and cannot possibly learn, in a given time, what normal children acquire with moderate effort. To introduce a lockstep system which requires all to move at the rate of the normal child stupefies the superior children and discourages the slow ones. We must provide, then, for three levels of ability—the superior child, the normal child, and the slow child. How shall the

curriculum be made flexible for these three grades of intelligence?

Artificial Acceleration or "Skipping Grades."—The method of introducing flexibility into the school course by "skipping" the superior child has very little merit. If the course of study is well laid out, so that each grade introduces experiences that are new and more advanced but all equally vital for intelligent living, then "skipping" grades denies the superior child a very necessary part of the curriculum. True, "the child who is promoted from 5B to 6B, soon adjusts himself" but why should the school create for these children a situation in which they are, even temporarily, maladjusted? If the geography of South America is assigned for the 6A, where will the child make up his loss? Why bring about these serious gaps in knowledge? If the content can well be spared, why include it at all?

The Three Rates of Speed.—Some school systems allocate the constituent subject matter of the curriculum in such a way that superior children can complete the eight-year course in six or seven years; normal children in seven or eight years; slow children, in more than eight years. Diagrammatically,

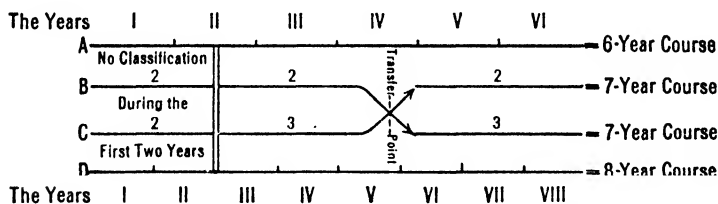


FIG. 3. THE ORIGINAL CRUDE DOUBLE-TRACK PLAN

the scheme may be represented as a four-track plan. Lines A and D are the main tracks. In the first two years, all children work at the same rate until the school has had full opportunity to ascertain the learning capacity of each pupil. At the beginning of the third year, the children are divided into A and D groups. The A group completes the remainder of the course in four years; the D group in six years. The A and D children who bear out the prediction made by the

school at the beginning of the third year, study the same content—the A's do so rapidly and the D's, slowly. The A child who fails to maintain himself is transferred after completing the fourth year to the slow group. He follows the path indicated by track B, 2 years + 2 years + 3 years; he completes the required course in seven years. The D pupil, on the other hand, who shows promise is transferred after his fifth year to the A group. He does the remaining work in two years. His progress is represented by track C, 2 years + 3 years + 2 years, total, 7 years.

The plan may be modified in many ways. More transfer stations from A to D and from D to A can easily be established. Nor is it necessary to wait until the end of the second year before differentiating the children; this may be done at the end of the first semester or the first year.

Another system which provides different rates of speed is known as *the large school plan*. Let us assume the following register:

4A (first half of fourth year)....	125 children
4B (second half of fourth year)....	120 children
5A (first half of fifth year)....	128 children
5B (second half of fifth year)....	127 children

There are enough children to make three classes for each half year. These are called $4A^1$, $4A^2$, $4A^3$, and $4B^1$, $4B^2$, $4B^3$. The $4A$ grade is then organized as follows:

$4A^1$	48 of the ablest children
$4A^2$	40 of the average children
$4A^3$	37 of the slowest children

The $4A^1$ are promoted to $4B^1$, then to $5A^1$, etc. These pupils are expected to complete the work of three terms in two. The $4A^2$ children are required to do a term's work in a term. But the $4A^3$ children are given a reduced and simplified curriculum in the hope that their retardation will be kept to an absolute minimum.

The significance of the grouping cannot be kept from the children. They soon learn that the school regards them as superior or inferior. Teachers and supervisors in offguard moments or in mistaken efforts at stimulation tell the children the basis of the classification. Children in the "one" class may develop exaggerated ideas of their ability; and their brothers and sisters in the "three" classes may suffer the discouragement which gives birth to a conviction of inferiority.

The plan cannot be applied easily in a small school that has only forty pupils in the 4A—enough to make one class. Shall the one teacher organize her class into three groups? The same objection arises—publicly differentiating the slow from those of average and superior ability. And how many teachers can administer a class of three groups effectively—teaching one group and keeping the other two occupied at worth-while tasks that can be checked and supervised?

By these time-saving plans for large schools, mentally superior children may complete the eight-year course before they are eleven years old and graduate from senior high schools at about the age of fourteen. A ten-year-old child in the seventh or eighth grade usually experiences great difficulty in finding friends. His classmates are often two or three years older. To play with them is difficult and even dangerous. Children of his own age are so far below him intellectually that no genuine companionship can be established. A college freshman, fourteen or fifteen years old, is frequently socially maladjusted. And the school has itself produced this problem in its haste to give him the uniform curriculum at an accelerated pace. It would seem, therefore, that under this plan, education is a thing to be rid of. If, on the contrary, the function of the school is to provide the child with new forms of living, then the abler child must be assured of a more enriched, not an accelerated, course of study.

The Enriched Curriculum.—What is meant by an enriched curriculum? How is a curriculum enriched? These are two questions that teachers persistently ask. To answer negatively, a curriculum is not enriched merely by adding more sub-

ject matter; nor by giving more arithmetic, assigning many difficult sentences for grammatical analysis, asking for the location of more places in geography, and for the memorization of more names and facts in history. Between a normal and an enriched curriculum there are many significant differences, and all of them are essentially liberalizing in their effect upon the pupil.

A curriculum is enriched in two ways: (a) by introducing new experiences rather than more of the old type; and (b) by introducing methods of teaching that require the exercise, in full measure, of the abilities of the superior child. Let us consider each in turn.

The child studying an enriched curriculum may be given an insight into the outstanding biographies of the great leaders in religious and social reform, in science, in art, in literature, and in military affairs. A survey of World History in close correlation with either the history in the usual curriculum, or the biographies suggested above, gives a useful background for much later reading. Greek, Roman, and Egyptian mythology, treated simply, forms an interesting and cultural addition that gives enriched meaning to literature and art. Another worthwhile activity that vitalizes history and geography, traces the milestones in human progress: discovery and development of tools and machinery; progress in transportation and communication; the discovery and application of nature's power, water, wind, steam, and electricity; the great secrets which man wrested from nature; the emancipation of the common man from ancient serfdom to modern sovereign citizenship. The study of a few carefully selected masterpieces in painting, sculpture, music, and literature makes an excellent addition to the curriculum. Elementary science and simple astronomy are unusually well received by the superior child. Nor must we fail to include a variety of creative activities, in clay, wood, iron, copper, brass, and leather. Children who give evidence of aptitude in fine arts or of capacity for sustained effort in any field of endeavor, should be permitted to carry as much advanced work as is in keeping with their distinctive ability. This applies not only to the arts but also

to the academic subjects. All of these suggestions need not be incorporated; a judicious selection of a few of these experiences will produce genuine enrichment and liberalization of existing curricula for superior children.

The method of teaching must be in harmony with the spirit of these suggested enrichments to the curriculum. Children must do much searching in the simpler reference books, must learn from seeking solutions of many problems and projects, rather than from material given by teachers, must come in close contact with museum materials, must visit many places of historic, industrial, and scientific interest, must have adequate laboratory facilities—learning must occur through living and the school must be made a place where the process of living is quickened and rendered more intelligent.

SUGGESTED READING

See Suggested Reading at the end of Chapter IX, p. 194.

QUESTIONS FOR DISCUSSION

1. Work out in general outlines a course of study in history, or in reading, or in manual arts which reproduces the culture epochs of the race. What are the advantages of this course over the course of study used in your community? Granting the merits of the course just formulated, have you proved the practicability of the Culture-Epoch Theory?

2. What facts of biology seem to give support to the theory of recapitulation?

3. Name three fundamental psychological facts that have shaped the curriculum. In each case, show how.

4. List the various educational opportunities, aside from mere schooling, which your community offers its citizens. To what extent are these utilized by the school system?

5. A school with a maximum classroom seating capacity of 1,800 must care for 2,900 children. Half a block from the school is a public library; across the street is a church with a large parish house that has a gymnasium and four club rooms; a block away, there is

a public park containing a playground. The school has two manual art shops and an auditorium seating 500. How would you organize your school so that all children are given full-time instruction?

6. What losses, if any, do the children suffer by your plan of organization? What advantages do they enjoy? Do the advantages overbalance the losses or vice versa? Give reasons.

7. Name six subjects that have been added to the curriculum since 1885. For each subject state the reasons which led to its inclusion.

8. "On purely psychological and disciplinary grounds, one may justify the prescription of almost any study." Do you favor the inclusion of a course in puzzle solving? Would such a course be popular? What reasons "psychological and disciplinary," may be given for the prescription of this course? Do these reasons justify the proposed course as a school prescription?

9. Read a course of study you know well and point out instances in which the curriculum violates the fundamental law of correlation. Suggest a project that interrelates these uncorrelated subjects. Analyze the project and point out the amount of formal subject matter that is included.

10. List the special needs of the children in the last class that you visited or taught. What disposition would you make of 200 minutes of unassigned time allowed each full school week?

11. With respect to each of the following subjects, indicate what would be included in a minimum course and suggest the limits for a regular course:

Arithmetic: decimals, areas, finding what part one quantity is of another

Spelling: useful rules, words used in business correspondence

Geography: the physiographic units of the United States, the exports and imports of England, chief harbors of Europe

History: colonial settlements, colonial wars, great inventions of the nineteenth century

Language Forms: the predicate adjective, noun or pronoun, complex and compound sentences

12. Distinguish the following plans of school organization through the high school: The 8-4 plan; the 6-6 plan; the 6-3-3 plan. Which plan is recommended by the advocate of the junior high school?

13. List the distinctive features of the junior high school organization.

14. Why is the junior high school, properly organized, regarded as a very effective aid in vocational guidance?

15. Give carefully planned evaluations of the following school practices:

(a) Presenting detailed prescriptions of subject matter in the course of study; for example, teach the following ten cities of England or the following twelve products; teach the following battles, dates, and names in the Civil War

(b) Permitting the five best pupils in each class to "skip a grade"

(c) Providing three rates of speed and a uniform course of study for all children

(d) Classifying children into rapid, average, and slow

16. Assume that you have a seventh grade of superior children. What would you include to enrich their course of study? What would be the prevailing methods of teaching? How would your methods of teaching differ from those you would employ with children of average ability?

CHAPTER IX

MODES OF EVOLVING CURRICULA

The preceding chapters studied in detail the principles that should guide in curriculum making and the means of applying them. Our present task is to survey the processes by which a curriculum may be formulated so that it embodies these fundamental principles.

1. Making a Curriculum by Following Tradition.—There are teachers who have abiding faith in the things that survive through the ages. Survival is attributed to no mere accident, but to inherent elements of strength. To survive, an idea, like a people, must enter into conflict with rival ideas. In the long run, the outcome is determined by superior merit. Hence, studies that have persisted through successive generations have, by their very survival, given proof of their value. The argument is not without merit but its strength is usually weakened by the excessive devotion of its sponsors. Carried to a severely logical conclusion, no new subject would ever find its place in the curriculum. There is a time when the old ceases to serve; then it must die. Neither sentiment nor misguided loyalty to the past must prolong useless life.

The force of tradition stubbornly retained Latin and Greek as the pivotal subjects of the college course; it was even more stubborn in keeping out the sciences. Many insist that high-school pupils be taught elementary and intermediate algebra and plane geometry and that solid geometry, advanced algebra and trigonometry be the minimum college prescription in mathematics. In vain, one urges the superiority of a single, highly interrelated course in high-school mathematics and another for the colleges. Tradition is an unyielding dictator. Why should children of New York City be asked to bound each of its five boroughs in their geography lesson? No

teacher who teaches this information knows it without committing to memory the various little streams, yet these facts persist and children in a foreign section of a Bronx school mouth and remouth, "Queens is washed on the west by the East River and on the south by the Atlantic Ocean." Small wonder that one little fourth-grade tot expressed her amazement at the prodigious dirt that requires washing by such mighty agents. How many intelligent citizens can secure passing grade in the geography test on South America given to sixth-grade pupils? Ask the teacher who has just taught American History from 1765 to 1820 for the first time what score she would have made six months ago in the test she gives the children at the close of the semester? In a group of twelve business men, most of whom were college graduates, not one could recall a single instance in which he divided by a mixed number or had to add fractions whose common denominators were not 2, 4, 6, 8 or 12. Why teach all children masses of facts that are rarely used in real life?

Certain fairy tales commonly included in courses of study in reading were analyzed by a group of over one hundred teachers. All admitted that the incidents were gruesome, that foul murder occurred too frequently, and that the obvious lessons which the children learned from these were sometimes actually harmful. Shall fairy tales be retained? The vote was overwhelmingly in favor of these stories and the common reason was that they had been handed down through many generations. These tales have high survival value, hence, the unwillingness to set them aside. Many nursery rhymes and folk tales are continued for no other reason than their repeated recurrence in the reading of each generation; they have been used so long that we are loath to discard them.

2. Making a Curriculum by Following Prevailing Practices.—Know what others are doing—this is the advice the superintendent often gives his curriculum committee. The implication here is clear: what most are doing is probably right. To close one's eyes to prevailing tendencies and practices is to refuse to profit by the experience of others. But to know what others are doing is no reason, *per se*, for doing

likewise. In planning a course in reading, one is confronted by the usual question of time allotment. It is well to know the common practice in this respect. Such data as is revealed in the following graph¹ is very helpful in many ways: it serves as a check on personal judgment and encourages the makers of curricula to strengthen their own position if it differs markedly from a plan that is generally accepted as adequate.

One of the significant retarding forces in the evolution of

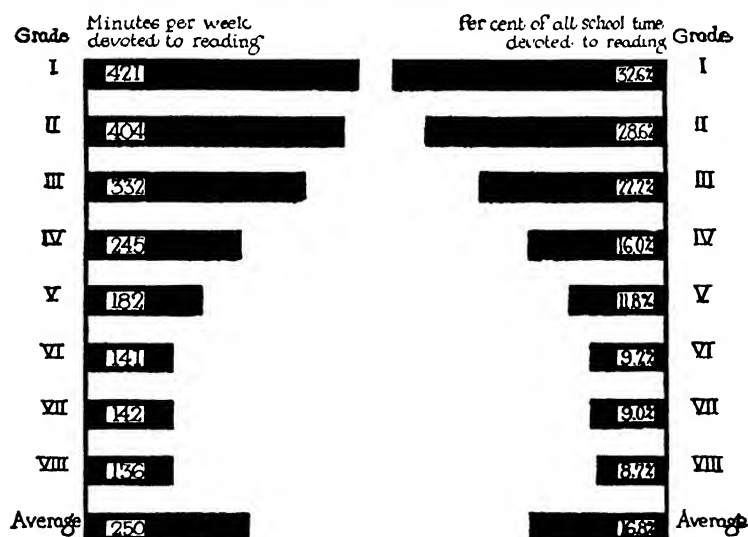


FIG. 4. GRAPH SHOWING AMOUNT OF SCHOOL TIME DEVOTED TO READING elementary and secondary-school curricula is the habit of uncritical conformity to prevailing practices in leading school systems. It paralyzes initiative and continues curricula long after they have ceased to serve the genuine needs of their time or place.

3. The Curriculum May Be Developed by an Analysis of Life's Needs.—Teachers of vocational subjects have evolved effective courses of study and a system of superior teaching by making painstaking job analyses. Every type of task that a practitioner of a particular craft is called upon to perform

¹ Research Bulletin of the National Education Association, Vol. 3, Nos. 3 and 4 (Sept.-Nov. 1925), p. 143.

is listed either in order of frequency or of difficulty. The first job on the list of the electric wiring trade is then analyzed by subjecting it to a series of questions: (a) When must this task be performed? (b) What should a craftsman know of physics, mechanics, or chemistry to understand this job? (c) What tools are needed? (d) What tool skills are necessary for the successful performance of this job? (e) What materials are needed and what characteristics of them must be known? (f) What related knowledge should the worker possess? He must make computations, write well enough to be able to fill out necessary forms required by a department of city government, or read well enough to understand city ordinances. When these and similar questions are answered fully for every job in the trade, the teacher of the craft has the makings of a course of study that is graded, complete, and enriched by all related experiences.

Spencer Applies This Method.—By a similar process of job analysis, academic courses can be evolved. The method is not new. Spencer applied it in formulating an answer to his question, "What knowledge is most worth?" To him the sole function of education is, "to prepare the individual for complete living." Granting that, he asks, "What are the activities of complete living?" These he sums up in five groups: (a) Activities governing self-preservation, which have reference to bodily health and correct food and clothing. Physiology, hygiene, biology, and chemistry—these are the subjects which are basic in this primary activity of life. *Science* is the guide. (b) Activities which indirectly minister to preservation. Housing, sanitation, avoidance of physical danger are illustrations. Here we need physics, mechanics, mathematics, chemistry,—again *science*. (c) Activities relating to proper care of offspring. Parents cannot perform their duties properly unless they know hygiene, physiology, chemistry of foods, psychology of the immature mind; once more *science* is the guiding star. (d) Duties and activities of citizenship. To understand our institutional life we need history; but not the history taught in the schools, the history of facts, battles, wars, men, and achievements of the dead past, but

rather a study of the laws of social conduct. Real history is, hence, *scientific sociology*. (e) Activities of leisure—these are the enjoyment of art, music, and literature. But, as these “occupy the leisure of life, so they should occupy the leisure of education.” After science has been mastered, the literary and æsthetic elements should be accorded a place in the curriculum. In the final analysis, Spencer argues, *science* is the key to all art. The sculptor must know scientific anatomy; the artist, the science of light and color; and the musician, the physical laws of sound. Without *science* there can be no art beyond the crudities of initial attempts. True appreciation of art is, therefore, intellectual rather than emotional.

Science, to Spencer, is the key to all activities of life. His is an education of the head, not of the heart. He often confuses “complete living” with “easy living.” To him “harmonious life” often means life with little friction, life of least effort. But moral fiber is strengthened through effort, and through the struggles that try men’s souls. Nor does Spencer realize that science, at best, teaches us “to know.” But “to know” is not necessarily “to do.” Most intelligent adults know the fundamentals of a proper regimen of life but many fail to carry it out. Spencer does not concern himself with the practicability of the task of teaching science and scientific sociology to young children nor the inability of mature scholars to draw from history the laws that should control all future conduct. He sees no power in the emotional appeal that so often insures correct action in people too young to understand. In Spencer, we find an illustration of a method of thinking preparatory to the making of a curriculum rather than an illustration of a practical program of school studies.

A Quantitative Study of Consumption to Discover Curriculum Material.—In recent years many studies have been made of the nature and quantity of goods and services demanded by society. In each case the investigator’s hope was to discover an objective standard which will determine the material that must make up the curriculum. The argument, reduced to crudest terms, runs somewhat as follows: What is needed most by society should be taught most through its

curriculum. Harap² investigated first, the *foods required*—quantity, kinds, costs, modes of purchase, extravagances in their use, relative values for human needs, and the like; second, *housing*—kinds, comparative costs and utilities, kinds of materials needed, sources, durability; third, the *household skills* like carpentry, painting, wiring, plumbing, and sewing—frequency of use, and cost to secure each form of service; fourth and fifth, *fuel consumption* and *clothing*.

At the end of this analysis, it is clear that one must know how to read, write, compute, and must have manual ability of a simple sort. Related knowledge of foods, people, life in other countries, origin of foods and common materials are also necessary. But such subjects as political and social history, literature, and the æsthetic arts are but vaguely suggested. Those who uphold existing curricula insist that we teach what is basically revealed in such a quantitative study; that we can profit by these statistical findings only in making more specialized applications; that it is more important to stress the fundamentals than the applications, for as life changes, only the child who has the primary skills of language, science, and arithmetic can make the new applications to new conditions.

4. Making a Curriculum by Trying to Produce a Desired Adult.—Curriculum making frequently starts with the question, "What kind of man or woman do we wish to develop?" School authorities then decide on the knowledge, skills, and attitudes which the desired product shall possess. The curriculum thus becomes the mold that will produce the approved form.

The curricula of secondary schools and colleges are frequently so evolved. Let us apply this method and formulate a high-school course of study. We begin by prescribing such courses as meet the common needs of educated men regardless of their particular interests or vocation. We then add a liberal group of subjects, too many for the limited time of any one student. Selection will be permitted, but it is hoped, not

² Henry Harap, *The Education of the Consumer* (The Macmillan Co., 1924).

without rational principle. In outline the course does not vary in many essentials from Bobbitt's proposal.

PREScribed COURSES

The Need of an Educated Person *The Courses Suggested to Meet This Need*

1. Ability to express oneself clearly and effectively.

2. Ability to make necessary computations of industry and commerce, to understand common statistical terms and principles, and to follow the mathematics involved in the explanations of simple scientific phenomena.

3. An understanding of the principles of simple tools and machines and the most significant inventions.

4. An understanding of the fundamental purposes of our social institutions and a knowledge of their origins and development.

5. A knowledge of the laws of health and the acquisition of hygienic habits that promote health.

6. An æsthetic sense well defined and capable of reacting to the appeal of the best in art. Emotions as well as intellect must be trained.

1. A two-year course in composition and word study which will give due emphasis to oral and written speech.

2. A two-year course in mathematics which integrates commercial and industrial arithmetic, plane geometry, elementary algebra, and simple trigonometry.

3. General science to be taught for at least one year. The fundamental principles of physics, chemistry, and biology should be included and presented through applications.

4. A two-year course in social studies comprising world history, United States history and government, comparative government and phases of modern social and economic life.

5. Four-year course in physical training and hygiene including general exercise, corrective exercise, games, and application of basic principles of physiology and hygiene.

6. One-year course in English literature and a half-year course in American literature. In addition, systematic presentation of outstanding masterpieces in painting, sculpture, architecture, and music—all appropriately and richly illustrated.

- | | |
|--|--|
| <p>7. Manual dexterity to meet the common demands of life.</p> | <p>7. In alternate semesters, courses designed to familiarize pupil with working drawings and to develop skill in the use of the most common tools and of most useful materials.</p> |
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The Elective Program.—Selections from the list below should be governed by the following principles: (a) no student should exceed a fixed maximum number of hours of class work per week; (b) rational concentration should be encouraged so that no student program shows too much diffusion or excessive specialization; (c) provision should be made for the academic needs of the professional career chosen by the student.

1. Three years of one foreign language
2. Advanced courses in mathematics
3. A full year course in one science with adequate laboratory work
4. A full year course in one period of history or the history of one nation
5. Advanced courses in English literature or composition
6. Further courses in the arts: music and drawing

Such a curriculum for secondary schools will provoke endless disagreement, not because the subjects included are not worth while, but rather because of the method by which the entire course was evolved. People differ in their conception of an educated or cultured person. Hence the difference in the molds they would create.

The colleges are often condemned for dictating high-school curricula through their entrance requirements. In theory, this may be true. But the new type of college entrance examinations shows clearly that the colleges are more concerned with the knowledge and the abilities of the students than with the allocation of a fixed number of hours to the several high-school subjects. At first glance, our proposal may seem at wide variance with college requirements but a closer analysis of it will dispel this suspicion.

5. Making a Curriculum by Scoring the Frequency of Reference to Certain Experiences in Life.—An argument that is defended by many insists that since the curriculum must prepare for life to-day, we must discover the specific knowledge which present-day living requires. But there is sharp disagreement about the actual factual needs of to-day. We have no objective method of ascertaining just what one should know. We rely on the judgment of the curriculum maker. But personal judgment is often mere opinion not free from capriciousness and prejudice. How shall we discover the knowledge that is really necessary? Study the newspapers and magazines and list the references to various phases of life. The advice continues: the more frequently an experience is mentioned, the more important it must be. Hence list the references to history, geography, science, linguistics, arithmetic, and art; tabulate the frequency of reference and you know the relative importance of each kind of information.

The system seems reasonable but few have had the courage to use the results. The interest of the moment often determines how frequently an experience is mentioned in contemporary publications. Study the newspaper of the day and the conclusion seems to be that in place of history we substitute the progress of baseball, pugilism, and the major sports; that we give the automobile and the radio a central place in the curriculum; that we may safely minimize the arts—music, literature, and painting; that we substitute for the geography with its old minutiae of capes, islands, and cities, a new minutiae of disputed boundary lines of small nations or the names of towns that serve as stopping places for aviators in their experimental flights.

The validity of the method of assigning a subject its place in the curriculum according to the frequency of reference in newspapers, magazines, and books of the day has not been established. The procedure is based on an assumption that is not without some logical sanction, but it is an assumption nevertheless. Too often, what is of the moment, is only of the moment, and may not reflect what is of permanent or vital significance. Thus far, the method has not given us either

a body of facts that we need know, nor has it indicated a set of skills that we need develop for use throughout life. If present curricula were refined through an evaluation of their contents, and if fundamental principles of the various subjects were applied to actual environmental conditions, we would probably evolve a more effective course of study than we could achieve through the method of "frequency of reference."

Evaluation of the Methods of Curriculum Making.—These methods for determining the content of courses of study are not mutually exclusive. Even though they overlap, they present different methods of approaching a vital task. A curriculum that is developed by one of these ways, should be checked by the others. The method of "frequency of reference" is thoroughly objective and therefore frees the course of study from such data as are included because of personal preference of the curriculum makers. On the other hand, a course of study that defies all the sanctions of tradition breaks completely with the past. Since the present is lived so largely in terms of the past, the curriculum must not be more ruthless to the past than life itself. These various methods are complementary and the process of curriculum making must, at present, continue to be eclectic.

Who Should Formulate the Curriculum?—Once the principles and methods of making a curriculum are accepted, the next question that causes no little acrimonious dispute concerns itself with the persons to be charged with its formulation. Some urge that the school superintendents, the policy-making officials, shall formulate the curriculum because it—the curriculum—is a concrete embodiment of fundamental faiths in education. Still others insist that the principals who supervise instruction, shall make the instrument that contains the subject matter of instruction.

In recent years, the educational specialist has found many to champion his cause. Surely, the university scholars who devote their best energies to a study of educational practices and of their relative values should be engaged to do the task that is highly technical. In all professions, we find parallel instances that call for the services of the specialist.

But what of the teachers? Shall we continue the old undemocratic practice that denied a place in the making of a curriculum to the only people who are professionally charged with its application in the classroom? The theory of the specialist, the policy of the superintendent, and the hobbies of the principals may present practical classroom difficulties not anticipated by their sponsors. The teacher is constantly testing the worth of the curriculum. Surely, the most progressive and effective teachers should have a voice and a vote in its formulation. What better means can we adopt for stimulating teachers to more intelligent effort and for quickening their professional spirit?

What a case can be made out for inviting carefully selected members of the community! Shall the course in hygiene and health be formulated without calling in the hygienist and the pediatricians? The course in local geography, without the leaders of the local food markets or without those who direct local transportation? The course in civics, without nonpartisan leaders in social reforms? The course in literature, without the makers of literature or the librarian in charge of children's branches in our leading library systems?

Curriculum making, in the final analysis, is a process of summarizing life and planning for living that is useful and happy. It is therefore a highly coöperative enterprise in which the best lay and professional minds of the community must pool their distinctive experiences and abilities.

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QUESTIONS FOR DISCUSSION

1. What is meant by the "sanction of tradition"? Name topics in arithmetic, geography, and history, commonly taught because tradition is followed. To what extent may one follow tradition with safety? What are the limits of reliability of tradition?

2. What school practices that have been changed or inaugurated in recent times are apparently without the sanction of tradition?

3. List the reasons for making a careful survey of current tendencies in curricular matters before formulating a curriculum for the schools of your community. Assume that you have accurate information of the curricular practices throughout the country; to what extent should you be guided by them in formulating the new curriculum?

4. By what method does Spencer arrive at an answer to his query, "What knowledge is most worth"? What answer would a religious person of extreme orthodoxy probably give to Spencer's question? By what process of thinking would this religious person probably come to his answer?

5. What do you consider the chief points of strength in Spencer's plan to educate for complete living? What are the telling weaknesses? What in modern education has been quickened or originated as a result of Spencer's advocacy of Science? Do the tendencies in contemporary art and music bear out Spencer's dictum, "Art cannot be truly appreciated without a knowledge of the appropriate underlying science"?

6. Select a simple process in the manual arts, say, putting hinges on a box that is to hold toys, or making a buttonhole in woolen material. Analyze this process, following the questions suggested in the text for making a job analysis. How can such an analysis aid the teacher of manual arts? How can the general principles of job analysis aid in curriculum making?

7. What is the aim of education as advocated by John Sturm, Milton, Montaigne, Rabelais, Rousseau, Locke, Pestalozzi, Herbart, Horace Mann, John Dewey? Which of these educators advocates a curriculum to fit his preconceived idea of a desired adult?

8. Analyze the course of study your school expects you, as a student, to complete. What subjects are prescribed? elective? Are your elections limited in any way to insure concentration or may you diffuse your elective courses? What, in your judgment, is the justification for each prescribed course? Do you agree with the judgment of the faculty or the curriculum-making body? What courses, not now included in your prescribed courses, would you make prescribed? Why?

9. What reasons are presented for giving students in schools of post high-school grade and in colleges a voice in curriculum making? Would you give students a vote as well as a voice in this matter? Why? Can the students in professional schools—law and medical schools—be given either voice or vote in the making of a curriculum? What reasons are advanced by those who insist that no student, however mature, is capable of formulating a course of study which must be taught to him?

10. Indicate, by citing specific examples, what each of the following may contribute to the task of formulating a curriculum: teacher, principal, superintendent, expert in education, selected laymen and women from the industries and the professions.

PART III
**EDUCATION AS SOCIAL
ADJUSTMENT**

**B. SOCIALIZING THE CHILD THROUGH
GROUP ACTIVITIES**

CHAPTER X

SOCIALIZING THE CHILD THROUGH GROUP ACTIVITIES

Earlier in our study we pointed out that the child is socialized through both his curricular studies and his participation in group activities. The curriculum teaches him to know. Without understanding, socially approved conduct may be a mere accident. The child may do the right to-day, and the wrong, to-morrow, without grasping the distinguishing principle of either. The curriculum is charged, therefore, with the task of leading the immature mind to a comprehension of the most vital social relations and their implications for individual conduct. Then, doing right is no mere chance.

But knowing does not insure doing. More than that—we may know the right and be unable to do it. Conduct results from training. The school must, therefore, create occasions which demand consistent and active pupil participation in group life. The curriculum makes the child institutionally minded; his group activities predispose him to conduct that has social sanction.

School Discipline a Means of Socializing the Child by Training in Social Conduct.—The school must, at all times, be considered a miniature society, governed by the same social laws as the large community of which it is a part. School discipline is bigger than the accumulation of all school regulations and all punitive school measures. Discipline is the total influence of the school which seeks, first, to rationalize, and second, to habituate social conduct.

The acquisition of a sense of social control is cumulative. It presupposes, (a) adequate understanding of social obligations and social advantages accruing to the individual from life in a modern society; (b) proper emotional attitude towards the social demands; (c) respect for the ideals of society

which may have their roots deep in older generations; and (d) habituation of certain primary forms of conduct. A social sense grows, day by day, as increasing maturity enables the child to understand the circle of ever widening social relationships. To discipline is, therefore, to develop independent social control.

Does School Discipline Develop Independent Social Control?—Judged by our definition of discipline, it becomes apparent that the school succeeds only to a very limited extent, for it does not seem to develop social control. The reasons are many; some point to necessary changes in school technique; others to the colossal problems which modern society has laid at the school door.

1. *Failure to Develop Proper School Spirit.*—No vital group response can be sustained without a proper group spirit. School spirit is really the personality of the group born of common attitudes. It exercises a subtle influence not only by preventing misconduct but also by stimulating the group to its best achievement.

School spirit is essentially a group attitude, and like all attitudes, is built up slowly through specific experiences. It results, therefore, from many favorable school activities and conditions: wholehearted team work among the faculty; genuine support of the school by the community; faith on the part of pupils and teachers in school purposes; many group activities like assemblies, pageants, athletic meets, public demonstrations of classroom work; identification of the individual with the group through school colors, songs, cheers, slogans; situations that arouse common loyalties like interschool contests in scholarship, athletics and community service; coöperation between home and school fostered by visiting teachers and parent-teacher associations. With the support of a proper institutional spirit, any group undertaking is assured of success; without it, failure is inevitable. The honor system in higher education breaks down completely without a supporting student attitude. Students can list as many reasons as the faculty to prove the moral wrong of academic cheating, but they go merrily on with their "crib-

bing" unless it is condemned by the attitude of the group. Even adult conduct is usually not a rational response but an expression of a desire for social sanction. He who would build up proper school morale must give his best energies for many years to the nurture of this delicate and slow growing spirit.

2. *School Regulations Do Not Always Have Their Origin in Social Need.*—A second reason that explains the shortcomings of school discipline was set forth, in full, in the introductory chapter of the book. It was pointed out that school regulations are enforced without assurance that the pupil sees their origin in social need. "Do not talk," "Come early," "Rule your spelling paper according to the model," "Use only that stairway which is assigned to your class"—these appear, to the minds of the children, arbitrary exactions of imperious teachers and principals. Pupils do not see that each regulation is another means of either safeguarding their lives or of securing for them, in greatest measure, the benefits which the school can bestow. Such obedience is impelled, not by understanding, but by fear. As long as school laws remain arbitrary demands, the school will fail to develop socially minded and socially acting individuals.

3. *Children Fail to See School Control as Social Control.*—Too often, the teacher does little more than set up a system of personal control; she interprets all misconduct as personal affront rather than as an offense against the class. The child feels that it is the teacher whom he hurt and he infers, not without reason, that he is being punished in the same spirit in which he himself would take vindictive measures if another child had offended him. The class, too, assumes that the teacher, in punishing a classmate, is checking up a personal score. Let us suppose that a child was sent out of the assembly by the presiding officer or was singled out because of some form of misconduct during a fire drill. After the return of the class to its regular room, teachers are wont to say, "You have disgraced me by your conduct in assembly or in the fire drill." Here, clearly, the teacher injects herself into the situation and presents her side of what seems a

personal quarrel. Suppose a child, in a class that has had perfect attendance for four days, comes late or stays away for a trivial reason on Friday. Why ask, "What do you mean by spoiling my attendance record?" The teacher must place herself in a highly immunized realm where she cannot be hurt by the actions of any child. But the class remains on earth. Its record of attendance or its reputation is lowered. Hence the class is called upon to resent the hurt it suffers. The teacher punishes merely to deter the wrongdoer from a repetition of his unsocial act. Fail to arouse this social displeasure and all in the class feel that there is an issue between the teacher and a pupil—an uneven fight at best. Sympathy naturally goes to the weaker side, the culprit.

4. *Order and Discipline Contrasted.*—The erroneous notion that the "fundamental aim of school discipline is the continuous control of the individual," is another condition that explains why the teacher fails to inculcate an institutional sense in her pupils. The final goal of all discipline is the development of self-control. In school circles, the teacher who is always controlling and always directing is known as the "strong disciplinarian." Strong, perhaps, but not, disciplinarian.

Teachers often use *order* and *discipline* as if these terms were synonymous, hence the fallacy of the "strong disciplinarian." *Order* refers to that condition of class management in which the children are absolutely quiet and the teacher is the master whose authority is never challenged. It is based on fear, and is maintained by unrelenting surveillance. Often, an innocent manifestation of individuality is construed as a sign of disorder and is at once suppressed. Both teaching and management are carried on with military spirit and precision. But *discipline* refers to a condition of class management in which children generally do right and require only an occasional direction. It is based on an understanding of simple group relations and is maintained by force of habit. Its outstanding characteristic is intelligent self-direction.

The distinguishing characteristics of *order* and *discipline* in a classroom are easily discerned. In a class that has *order*

no child would dare go to the basket to dispose of a bit of waste paper or leave the room without explicit permission from the teacher. In the midst of an explanation, children raise hands to ask permission to leave the room. In a class where *discipline* prevails, the child makes temporary disposition of his waste paper and, later, goes to the basket without telling his teacher. He chooses the time when he is waiting for his slower classmates to complete some written work. Nor does he break into the lesson to announce his desire to leave the room. He goes, when he must, and enters his name and time in a book kept conveniently near the door. The teacher inspects the book regularly to find those who abuse the privilege by leaving the room at every session. Watch the class as a visitor enters and engages the teacher in conversation. Where *order* and only *order* is maintained, each child sits in painfully erect position, idly waiting for the next command from the teacher. Where *discipline* is established, children take out books and, without direction, busy themselves at some incompleted task. Some read, some correct the mistakes they made in their arithmetic assignment, others do part of their home work for the next day—all make intelligent use of their time.

Where there is genuine discipline, there is a hubbub of busy workers, not the stilled oppressive silence accompanying order. Why do so many teachers seek that degree of quiet which enables them to hear "a pin drop"? Why hear a pin drop? The class that is disciplined is orderly, but the class that is orderly is not necessarily disciplined. The test lies in leaving the children alone.

Discipline and *order* are relative conditions. It is obvious that one must first secure *order*. Obedience is a primary social requisite. Hence *discipline* is hardly possible in classes not yet trained to *order*. Our quarrel is with teachers of the upper classes who have excellent *order*, but seldom change to *discipline* with its basis of self-government.

5. *Failure to Establish a Routine That Makes Social Conduct a Habit.*—School discipline may be ineffective because teachers fail to provide a routine which not only insures

proper conduct but makes misconduct almost impossible. Sometimes it seems as if the teacher waits for improper conduct and then pursues it relentlessly. Why not anticipate the conditions that give rise to misconduct and prevent their occurrence? Such activities as—distribution of supplies, disposal and distribution of clothing, dismissals, roll taking, physical inspection, and the like must be routinized so that they are carried out uniformly and consume an absolute minimum of time. A new or an unfinished task should always await a class upon its entry into the room. The teacher's day must be carefully laid out so that there is no gap between lessons when the teacher decides on the next activity.

A young man was thoroughly discouraged after his first month's experience as teacher of bookkeeping. "The incessant chatter throughout the lesson unnerved me," he complained; "I order them to stop talking but a moment later the condition is as bad as it was. I teach little and they learn less." A few questions as to routine brought out the following: "I wait until the bell rings, then I call the roll and mark lateness and absences. That takes a few minutes. After that I go to the blackboard and put on the form to be taught. This takes another five minutes." The experienced teacher knows, of course, that by that time, the class is lost. Will these young girls who have so much to say to one another sit quietly and watch the new business form as it evolves under the hand of the teacher whose back is turned toward them?

The remedial program suggested to this young man is obvious to the teacher who has served his novitiate. Draw the forms on large charts or on the blackboard before the class comes in. The moment the bell rings, begin work. Call on pupils to read the form, to name the old elements, to find new ones and to formulate the aim of the lesson. Immediately after the new business form is taught, assign the problems to be worked out by the pupils. While the class is busy at the assigned task, check attendance. Each pupil should take an assigned seat; an empty seat means an absent pupil. The novice returned, after a few weeks, thoroughly

heartened. "It works," he gleefully exclaimed. He had learned his lesson. He no longer waited for misconduct; he anticipated its causes and eliminated most of them.

6. *Negative Standard in Discipline.*—The measure of class discipline is too frequently negative. The child is rated high or low in conduct not for what he does but rather for what he does not do. He who does not speak out of turn, does not come late, does not absent himself, does not attend to matters other than those under discussion, does not delay his assignment—in a word, he who does not violate any regulations is considered a highly desirable citizen. But our worth should be measured by what we do, not by what we do not do. Teachers should be ever ready to reward the pupil for positive action. The child who busies himself at once when the teacher is engaged in conversation with a supervisor, is more praiseworthy than his classmate who waits quietly and idly for the resumption of the lesson. So, too, pupils who return on Friday after an illness of four days should be praised for not adding a fifth day to round out the week. Voluntarily sharing one's possession with a fellow pupil, praising a classmate for merit in his composition before pointing to faults, making a sacrifice in a game in the interest of better teamwork, offering to help a weaker pupil after school hours, taking the initiative in making a new pupil feel at home—these positive forms of action should weigh heavily in making up the conduct grade of a pupil. The class, if old enough, should be led to understand the superiority of positive over negative action.

7. *Training in Self-Control Through Assumption of Social Responsibilities.*—School discipline would gain in effectiveness if it were intimately associated with social responsibilities. In adults, the prompt and cheerful fulfillment of social obligations is indicative of character. Classroom duties should be borne by the class. The inspection of floor and desks, examination of textbooks to ascertain how well they are cared for by their temporary owners, keeping attendance records, distribution and collection of supplies and report cards, mimeographing, the care of plants and classroom pets, the cleaning of boards,

erasers, and inkwells, searching for data to clear up disputed points in a lesson, writing for various aids that are distributed by public and private agencies—these and other duties should be assigned to appropriate committees. It is a grave error to reserve these tasks exclusively for those who are most obedient and responsible. All should share in them, each according to his abilities. The least responsible pupils should learn the meaning of a trust by carrying their full burden of class responsibility. Should the pupil charged with the safe-keeping of the athletic paraphernalia misplace the basket ball, or the pupil charged with keeping court lines prominently marked, fail to have his task completed and well done by the time the game is scheduled to begin, he will learn soon enough that his group will not tolerate the shiftless and the shirks. If the school is a miniature society, then its round of social duties must be used as media for developing socialized conduct.

Pupil Self-Government.—Many principals regard a system of pupil self-government as the most effective means of developing the art of self-direction. To care for the routine of school management, the school is organized as a democracy. In the Gill System, school government reproduces the organization of city or state government; in the Ray System, the classes elect tribunes who form a governing council; in the Brownlee System, each class is a social unit, elaborate plans of nomination and electioneering are carried out, and the school is governed by a mayor and a small group of officers. These recognized plans need not be duplicated. Any sensible system of democratic organization will serve the purpose. Under it, each teacher is relieved of the responsibility of pupil conduct outside of the classroom. The duly elected officials take care of assemblies, yards, stairs, and school approaches; they arrest the offenders, bring them up on charges before the judge, who sentences them according to a definite code. Each child soon learns that an act of misconduct is an offense against the school.

Self-government when tried as a school plan under an enthusiastic principal and cooperating corps of teachers is usually successful. But when the plan is applied to a single

class, its values are dissipated. The reason is obvious. A weak "disciplinarian" cannot carry out such a scheme. The strong teacher feels that she can do very well without it. There seems to be no motive that would lead her to adopt it. In the final analysis she, more than the weaker teacher, needs the corrective influence of some form of self-government.

George Junior Republic.—For a long time, the principle of self-government found its most successful illustration in the George Junior Republic. The Republic is a colony situated in Freeville, N. Y., within an area apparently not under the jurisdiction of the laws of New York State, except in very serious offenses. To it, boys and girls between the ages of sixteen and twenty-one, are sent for acts which range from petty theft and mere unruliness to serious crime. Its organization is modeled after the United States, for it has a president, two houses, a judiciary, a constabulary, a jail, a health department, a mint—most of the socially necessary institutions. All the officers are elected by the inmates from their own members. It is a government of, by, and for these boys and girls, the citizen body.

The motto of the Republic is "Nothing without labor." To carry out this policy, the colony offers work to its citizens at almost any occupation. It has its own money, which has, within its own borders, the usual monetary value and function. To earn money to meet living expenses a boy or girl must work as farm hand, porter, chambermaid, cook, baker, carpenter, printer, plumber—any of the callings useful in a society. The workers are paid a *per diem* rate by the Republic or by a contractor, a citizen, himself committed to the colony, who has through thrift and foresight saved enough to rent land, build a store, and open a restaurant or sundry business of his own.

Lodging can be had for prices varying from, say, ten to twenty-five cents a night, depending on the style and comfort that is desired. Meals can be had at the same variety of prices, according to the Epicurean tastes of the citizen. A boy or girl, once admitted, is given employment, but he or she need not work. Food cannot be had without money.

Lodging must be paid for in advance. The person who refuses to work may loaf and enjoy himself, until he becomes hungry, then he begins to think. At night he has no bed and, before he realizes the full force of his predicament, the Republic policeman arrests him for vagrancy. He spends the night in jail and the next day the judge sentences him to forced labor in the jail yard until he has paid off his fine and can satisfy the authorities that he will keep fed and housed for a minimum time. Jail prices are low and jail work unpleasant. The vagrant learns to do half the work for double pay as a free man and to keep out of the policeman's path. If a boy or girl steals, the victim calls for the police at once. He worked for his money honestly, and he resents losing it because of the cunning or the dishonesty of another. Should a contractor or a foreman find workers who shirk on a job, he loses no time in discharging them; he can get better workers and make more; he is responsible for the economical conduct of his office.

The basic idea of the Republic is embodied in its social conception. Our own society is so large and unwieldy that an act against society is hardly felt by the individual citizen. Theoretically, an injury to one is the concern of all. The George Junior Republic is so small that social interdependence is felt immediately and directly. The Republic tries to counteract delinquency by making the wrongdoers live social lives and feel the consequences of unsocial conduct.

The skeptic and the interested student ask, "Has the scheme succeeded? Is it proving worth while?" The nature and the scope of the influence of the Junior Republic can only be suggested in the limited space that is available. A mere affirmative answer to these questions does not suffice. One must actually see the changed spirit, the new life, the reclaimed social wrecks, to appreciate the moral force of this self-government colony.

Values of Pupil Self-Government.—Many character gains are attributed to self-government in schools. (1) It helps to keep in the minds of teachers and pupils the ideal of human conduct, self-government. (2) It encourages simple and con-

crete instruction in civics. (3) Preparation is given for life in modern democratized society in which government derives its power from the consent of the majority of the governed. (4) Ideals of civic and individual conduct find in this scheme ample opportunities for translation into action. (5) The child's perception of the meaning and the need for law is sharpened. (6) The child's conception of school justice is liberalized because he is tried by his peers who derive their authority from him and his schoolmates. The child, like the adult, is apt to accept with resentment, the justice meted out by teachers and principal who bear down upon the culprit with all the power which the laws of society give them. The child, although a prisoner in the school court, is nevertheless part of the society that created the court. (7) Under any acceptable plan of self-government, pupils have added opportunities for training in self-expression and for thinking together in the endeavor to reach a common conclusion.

Self-government plans have their administrative values. (1) They relieve teachers and supervisors of no small burden of routine. (2) Better school spirit usually follows in their wake. (3) The relationship between pupils and teachers is rendered more helpful and more intimate. Children understand the school purpose better and are, therefore, more coöperative in every enterprise that is undertaken in their behalf.

Limitations Urged Against Self-Government.—Not a few school men regard a system of pupil self-government with more than passing skepticism. They argue that any system of government, to be effective, must come from the governed. A superimposed plan is bound to fail, for it is artificial and lacks motivating power that evokes the genuine coöperation of the governed. In the final analysis, any school system of self-government is an imposed plan, for it arises in the will of the teachers or supervisors and is continued by their grace and their authority. Furthermore, a system based on our political life may be well suited for adults but is, of necessity, ill-adapted to child life and child attitudes. The result is

a system of supervision so extensive that it makes mere puppets of the children and increases the burden of principals and teachers.

The opponents of pupil self-government believe firmly that the essential factor in the growth of children should be love and respect for a personality, a teacher or principal. No impersonal system can have for the young child the appeal of a real living person. Children should learn to respect authority rather than to exercise it. To put children in a position where they judge rather than are judged may make them arrogant and officious; they may become priggish in their "holier than thou" attitude. Power should be exercised only by those mature enough to avoid its abuses.

Evaluation of the Merits and Limitations of Self-Government.—We have no objective standard for measuring the worth of the results of such pupil activities as self-government. The final decision of its worth is still based on personal opinion and personal experience. It does seem that both advocates and opponents overstate their case, the one side being buoyed up by an optimistic faith, the other being rendered stubborn by skepticism towards any system so generous in its promises.

True, children should learn to respect authority rather than exercise it, but, will not the actual exercise of authority give a deeper insight into its need and thereby intensify the respect the pupil has for it? The child acquires a property sense by making something useful, by devoting energy to it and by giving it the time that he takes from his game. Those who pay for their property respect it. Shall we argue that the child should learn to respect property without acquiring it?

Undoubtedly few of the facts of actual civics are learned merely by participating in a system of self-government. But an attitude towards civic life is developed and this is the vital outcome we seek in most subjects.

Perry fears that pupils will be too busy governing others to have either time or inclination to govern themselves; hence, he argues, self-government is a misnomer. If the plan of self-government is inclusive and permits all old enough to

participate in the school elections, then government for the average child becomes indirect. Any system that vests authority in the few and permits the many to forget the principle of government by majority develops a governing class that may be more willing to govern others than themselves. Proper safeguards can readily be established in a school so that self-government is essentially what it purports to be.

Only under a principal with foresight and enthusiasm can self-government succeed. As the plan progresses, interest lags, as it does with most administrative devices. New stimulation is required; without a recharging of enthusiasm, the scheme becomes perfunctory.

We have little patience with the argument that the strong principal can get along without it. Can the pupils get along as well without the results that self-government promises? This is the vital question. Pupil self-government cannot carry the whole burden of the discipline of the school. It is a supplementary agent that is well worth trying after the pupils and teachers have been adequately prepared for it.

Religious Education as a Means of Socializing the Child.—

*In the Past, Education Was Controlled by the Church.—*Those of orthodox faith are doubtful of the ultimate success of all secular efforts of the school to socialize the child. Without religion, they insist, no permanent attitude towards social obligations can be inculcated. While they do not ask for the domination of secular education by the church, they do seek an intimate relationship between the two, and they urge the inclusion of religious instruction in the school curriculum. They hope to end the practice of our day, in which religious education is, for most children, an extracurricular experience.

In the past, education was the function of the church. Every school curriculum was first religious, then secular. Since the school was only a specialized agent of the church, its basic aim was to perpetuate the dogma of the parent institution, the church.

*Weakening the Grip of Religion upon Education.—*The history of elementary and secondary education is an interesting

story of a slow and persistent emancipation of education from church domination.

The beginning of the twentieth century found the church, in most countries, with only a vestige of its former power in education. The grip upon secular education was broken for many reasons—all deeply significant. The growing spirit of independence in politics clearly discernible in the latter part of the eighteenth century made itself felt in other relations in life. Religious control was bound to weaken, for its basis of faith implied the subordination of individuality to authority. With the separation of church from state, came a widespread belief that education, in the main, is a secular matter which must be under the control of the state. As the sovereignty was taken from the few and vested in the many, the control of education by religion became progressively weaker.

Keen disagreement with the church and disappointment in its policy led some to insist on the secularization of education. The church offered stubborn opposition to the development of science. In politics, it was too often on the side of the ruling classes and, at times, conveniently invoked divine will as an aid in keeping the mass of mankind in its accustomed subjugation. Its gospel was not infrequently misinterpreted and its inspiration was too often dissipated in extravagant fanaticism. Little by little, the power and the prestige of the church were transferred to secular and political institutions.

The Modern Plea for the Inclusion of Religious Education in the Lay Curriculum.—Loss of faith in the old dogmas unchurched the masses. They need, as much as ever in the past, the moral guidance of those who have dedicated themselves to make life useful, just, and happy. No mere intellectual appeal will suffice for the many. Few have been endowed with the intelligence implied in purely rationalized conduct. Most of mankind must be moved by an appeal that is emotional and derives its authority from a divine source.

The psychology of our day teaches clearly that our intellectual processes are mendacious. They lead us to formulate justifications for what we want to do as well as for what

we ought to do. The revolutionary leader in the saddle gives himself as many reasons for denying freedom of speech and press and for disenfranchising legions of citizens as he gave others for rising in revolt against his predecessors in office who practiced these repressions on a less generous scale. It always makes a difference whose ox is gored. Rationalized conduct is relative and selective because it is opportunistic. But, religious conduct, orthodoxy holds, is as absolute and immutable as the divine source from which it derives its sanction.

Plans for Making Religious Education Part of the Regular Curriculum.—Where religious instruction is incorporated in the general education of elementary pupils, one of two common practices is followed. The first system, popular in England and demanded for American communities, provides for special periods when secular school subjects are suspended and the children are assigned to religious teachers according to their grade and denomination. The instruction is regular, systematic, graded, and in close correlation with the geography, history, civics, and literature prescribed in the regular course.

This system makes unnecessary the Sunday School, a peculiarly American institution. Again and again, Sunday School instruction has been evaluated and found wanting. As a rule, the teachers in these schools are untrained pedagogically and give service voluntarily; many do not know what studies the pupils pursue in their secular school. To these limitations we must add a course that lacks gradation, and a student body very poorly classified. In some large communities, churches of allied denominations have organized a coöperative teacher-training school and have introduced school practices that approximate the methods of the better secular schools.

A second plan for insuring religious instruction is through a system of parochial schools initiated and maintained by various denominations. In some cities these schools receive subsidies from the public purse; in almost all countries, they are exempt from taxation. The state maintains indirect supervision by prescribing minimal courses of study in nonreligious subjects and by setting up requirements for teachers' licenses.

The money grants or other material advantages enjoyed by these schools are justified on the ground that the denomination supporting a parochial school relieves society of its obligation to give each child a secular education. In the end, the state is undoubtedly saved considerable financial outlay.

For generations many of the European countries gave their children an elementary education through a system of parochial schools. This was the prevailing system in France prior to 1902. Recent serious disturbances between the French government and the clericals were precipitated by the determination of the officials to end this direct church control of secular education. The crisis in Mexico during the summer of 1926 is, in many respects, a parallel instance. In the United States, the Roman Catholics maintained, in 1924, a total of 9,783 parochial schools and colleges having an aggregate faculty of 71,705 teachers who instructed over 2,300,000 pupils of all grades. In the City of New York alone, almost 150,000 children received their elementary and secondary education in parochial schools of all denominations.

In our country neither system seems to meet with more than local or denominational approval. It does not seem possible to devise a scheme that will prove satisfactory to so heterogeneous a population as ours. To sort children according to religious affiliations, is, indeed, dangerous for public schools in a democracy that has consistently fought clear of a state religion. The public school should be the last place where Protestants are set off from Catholics, and Christians, from Jews. Not a few orthodox believers feel that the full meaning of religion cannot be taught to immature pupils; all that we can do is to give them a mind-set, an emotional receptivity, for a fundamental philosophy of life to be developed later. But this is a task entirely too delicate to be entrusted to public institutions. The home and the church must carry their full responsibility.

Difficulties of Incorporating Religious Instruction in the Curriculum.—Those who advocate the incorporation of religious instruction in all secular education are confronted by many trying problems in addition to the task of overcoming

the force of American tradition. The basic difficulty is the inability of intelligent minds to agree on what constitutes religion. To certain thinkers religion is the worship of truth or a consistent attitude towards all of life. James believed,¹ "Religion is man's total reaction to life"; Schleiermacher,² "Religion is a sense of infinite dependence." Realist and idealist agree with Chesterton that the "most practical and the most important thing about a man is his view of the universe." So long as we accept this purely objective and thoroughly undenominational view of religion, there can be no two sides to the question of introducing religious instruction in public secular studies. In teaching science, literature, history, art appreciation, or cold and analytical mathematics, every real teacher is earnestly trying to give his pupils what he regards as a true view of the universe or a fundamental attitude towards life.

But there are others whose conception of religion is more restricted. They never forget the implications in the commonly accepted etymology of the word, *re*, back or again, and *ligare*, to bind—a force that binds us again and again to those who view the universe as we do. These students define religion as³ "An attitude of conduct and life directed towards a power without"; they agree with Jastrow⁴ that "Religion is the natural belief in a power or powers beyond our control and upon which we feel ourselves dependent." Do we believe in a power or in powers? Here the camp divides at once. What shall we call this power, God or Natural Force or Evolutionary Imperative? A veritable Tower of Babel is created as we seek the answer. No one has given us a universally accepted conception of religion. Without that we cannot agree on what to teach nor on the definite objectives.

What shall we do with those who have no denominational affiliations? What religious education shall we give them?

¹ William James, *Varieties of Religious Experience* (Longmans Green & Co., 1911), p. 35.

² *New International Cyclopedia*, Vol. 19 (Dodd, Mead & Co., 1922), p. 679.

³ *Ibid.*

⁴ Morris Jastrow, *A Study of Religion* (Charles Scribner's Sons, 1901).

Shall they be excused from school duties while their classmates are instructed in religion? Is it wise to segregate a group of children because of their parents' beliefs, and lay them open to the jibes of their classmates whose parents are denominationally minded?

How shall we guard against the overzealous teachers or principals who may hear the call to bring back all the wandering sheep to their respective denominational folds? They might exercise a mild but persistent coercion on the children of those who were brought up in the faith of the zealous principal but who are now beset by doubts, not about religion in the abstract, but about specific denominational tenets? Ardent teachers might exercise their influence in favor of one denomination and against another, quietly and subtly, but without even suspecting themselves of transcending the limits of their legal and professional authority.

How many religious denominations have an adequately trained body of teachers to give religious instruction if the opportunity demanded were granted by public education? Do these teachers understand the school and the child? Are they masters of the technique of teaching and class management? The solution suggested in many quarters is to employ the teachers of secular subjects to give instruction in religion to those of their own faith. Religious consciousness of this kind often makes for clannishness and religious loyalties are usually very intense. Are we to identify religiously both children and teachers in our public schools? Under such a plan, will the children whose religion differs from their teachers' still believe in the meticulous impartiality of their instructors and supervisors?

The memory of old failings of religious institutions causes not a few to oppose denominational religious instruction. They seek assurance that no static religion will be taught but rather a religion that grows as life grows. They fear lest their children be made intolerant of those who disagree with them. They express no small concern with the tendency of religions of the past to emphasize adherence to form, rather than to stress proper behavior. It is because the future is

judged by the past that so many misgivings beset the educator who must decide whether secular education shall incorporate religious instruction given in coöperation with denominational representatives. Left to the churches, moral education may become more theological than religious and the children may learn to follow the priests and the ministers rather than the prophets whose complaint of a bygone age may serve as an indictment of much that is practiced in religion of our day:

To what purpose is the multitude of your sacrifices unto me? saith the Lord: I am full of your burnt offerings of rams and the fat of fed beasts.

—ISAIAH, 1:11.

Ethics Without Divine Sanction the Religious Teaching for Public Schools.—How shall we resolve our problems and answer the doubts of honest teachers? No successful harmonizer has, as yet, arisen. The only practical program that we may apply in public education is to teach the principles of right and wrong by appeal to reason and innate humanness, but without reference to denominational canons or divine revelation. What is common to all denominations, fundamental principles of ethics, must be made an integral part of the course, so that children may learn how to live together and may develop an attitude of genuine respect for all beliefs.

Lamentable Ignorance of the Bible. Because of the separation of religion from secular education, young people frequently exhibit startling ignorance of the Bible. Its significance as literature and the frequency of biblical allusions in art, music, and literature make the study of it imperative. Few books are as helpful as the Bible in building up rich and lasting pictures of ancient civilizations. Much of our teaching of history is posited on the belief that he who does not know how mankind has lived can hardly know how it lives to-day.

Teachers in secondary schools and colleges are no strangers to the prevailing ignorance of the Bible. Many college seniors, only one semester removed from rendering service as teachers, when asked, could not explain the reference in the expression, "The patience of Job," and pronounced the

name as if it rhymed with Bob! Nor did they know the meaning of Daniel's judgment. Very few could name the Disciples. Not one student in a class of forty-five college seniors could give a mature characterization of the Prophets; few could give the names of five Prophets; none could convey an intelligent idea of the time, the message, or the influence of the Prophets. Almost all of these students knew the deities of classical mythology and many of them were alarmingly well versed in the lascivious tales of Zeus and his under gods. But no one really knew Isaiah, Jeremiah, Hosea, or Amos—Prophets whose religion Christ loved and whose inspiration he helped to perpetuate.

The Extracurricular Activities as Socializing Agents.—
Place of Nonacademic Activities in a School Program.—Extracurricular activities have made a permanent place for themselves in present-day school organization. Through them the pupil finds his friends, learns to make a variety of social adjustments, and develops school traditions that build up an abiding school spirit. Every teacher has seen children more potently influenced by their scout troop or their club than by the school and its corps of trained workers.

The outstanding value of extracurricular activities lies in their power to educate for leisure. They should, therefore, be removed from the side shows of education and made an integral part of the school program. The distinction between curricular and extracurricular activities, necessary perhaps in college, has nothing to justify it in elementary and secondary schools. Extracurricular activities should be supervised as carefully as any other school undertaking. They should be made part of the regular, not the voluntary work of the teaching staff.

The list of these activities is long, too long to be incorporated *in toto*, in the scope of any one school. Authorities must study their schools and decide which of the accepted extracurricular activities will serve their peculiar needs best. Among the activities from which they may select we must list the following: athletics, clubs, auditorium exercises, school papers, school banks, scout troops, big brothers and big

sisters, service leagues, and parent associations. The place of athletics in school life was considered at length in the study of physical education.

School Clubs.—The values. School clubs may exercise a far-reaching influence on their members for they cater to every legitimate human craving. A school may have an arts and crafts club, a camera club, an outing and nature club, a literary and debating club, a dramatic club, a walking club, a tennis club, a social club—clubs to satisfy the whole range of normal interests of youth. Through these clubs, children learn the art of self-government, taste the joys of intimate friendships, and develop worth-while hobbies and group loyalties. In the clubs, teachers come in closer and more informal relation to their pupils and thus really learn to know them.

Suggestions for supervising school clubs. Little that is good comes out of juvenile clubs that are not supervised by competent leaders or directors. A sympathetic older person must offer judicious guidance at every turn in the life of the group. Early in the school year, there should be adopted a definite program of work which carries out the distinctive objects of the club as expressed in its constitution. Without such a program, the meetings soon lose their attraction and the club drifts aimlessly until it disintegrates. Principals should visit these clubs at least once each semester, and should evince an interest in their activities; they should make club announcements during auditorium exercises, and should lose no occasion to commend meritorious club enterprises. It is perhaps needless to suggest that club money should be in the hands of the faculty advisor while financial records should be kept by the pupil secretary-treasurer.

The Auditorium Exercises.—School assemblies, carefully planned, do much to identify the pupil with his school and to arouse a sense of school loyalty. The principal's prestige helps him to make more effective patriotic or ethical appeals than are possible in the average classroom. In well planned auditorium programs, children learn to appreciate the masterpieces of music played for them. They also learn the patriotic songs and folk songs that have come to us down the ages.

Administrative routine is facilitated, for school regulations can be explained to the whole school or a large part of it. During the assemblies, school success is reported and school failures are announced in a manner carefully designed to stir pupils to greater effort.

Suggestions for enhancing the values of school assemblies. The color guard, school colors, and the salute to the flag—all help to make the assembly more impressive. As far as possible, pupils should take charge of the exercises and an individual class should be made responsible for the program of the day. The activities presented must bear a close relation to the work of the class that acts as host. Suitable for inclusion in auditorium activities are pageants, plays, group songs, folk dances, reading of original compositions, and exhibits of success in regular class subjects. Occasional meetings should be turned over to the school orchestra, to the glee club, or to a teacher who has a hobby. Inspirational speakers, accustomed to addressing juvenile audiences, should be invited occasionally. Illustrated talks on the work of the more vital departments of government—fire, health, police, water—by well chosen representatives are usually popular and worth while. Representatives of local business—a newspaper reporter or a railroad engineer—often make a refreshing change in the usual program. Exhibitions by local artists and readings by writers of merit who come from the local community are appreciated by teachers as well as pupils. The principal who appoints a faculty committee on assemblies and meets regularly with it, will usually formulate more inspiring programs than the one who assumes the whole burden.

An important principle in shaping a program is to formulate a central connecting theme or themes for the year or the semester. To fill the auditorium programs with every variety of activity may please for the occasion, but the impressions are soon forgotten and the effects sought are dissipated in the excessive variety.

Big Brother and Big Sister Organizations.—Much good can be done in large urban schools by enlisting the services of the

ablest and most responsible pupils in the service of their younger brothers and sisters. A junior high-school pupil who is especially proficient in mathematics or spelling or penmanship may be appointed big brother or big sister to a third-year boy or girl who needs special help. The older pupils receive directions from the teachers of the little brothers or sisters and report each week the number of times they met their charges and the progress they noted. This help may be given in school, after hours, or in the home of the younger child. Especially selected ninth-year children should be entrusted with the task of bringing to school those in lower grades who are most prone to hear the call of the street and to begin a career of truancy.

Big brothers and big sisters should be appointed only with the consent of their parents and should function only under faculty direction. Their positions must be publicly recognized by the wearing of the school colors and their services judiciously extolled in school assemblies. Every caution should be exercised to maintain as wide an age gap as possible between big brother and little brother, and to guard against an assumption of unwarranted authority by the older child. Big brothers and big sisters should be members of a special group that meets regularly for help and guidance so that they may learn to discharge their duties sympathetically as well as competently. Under proper administration big brothers and sisters receive a significant training in social service.

Service Leagues.—As early as capabilities permit children may be enrolled in various community service leagues. In a large school, some older children are needed to help those with physical disabilities at street crossings and up and down stairs. A home for the aged in the neighborhood may be calling for volunteers who will read to those inmates who can no longer see the print. Parks in the vicinity of the school may be littered with papers, and shrubs damaged by careless visitors. The school street may be visited at dismissals by peddlers with gambling devices. The sharpers, who encourage children to take chances on gambling machines, ply their

trade because they keep a watchful eye on the uniformed policeman. The new school building may have walls that are bare and window sills that would insure plants welcome warmth and sunshine. But the school is financially unable to make the necessary purchases. Thanksgiving baskets would be especially welcomed by the authorities of a neighboring nursery. There are children in the school whose homes would cheerfully contribute the makings of these baskets.

The school must regard these conditions as opportunities for training young self-centered people in service for others. A group is organized to help schoolmates who have physical disabilities; another, consisting of superior children who read aloud intelligently and in a pleasant voice, brings the joy of the printed page to those whose eyes no longer see. The *School Decorators* is an organization of pupils who make window boxes and fill them with good soil so that each class may grow its own plants. The *Park Protectors* assist the police in conserving the public parks of the neighborhood.

There is danger that the enthusiasm attending the inception of these service leagues may die young. It is important, therefore, to establish a limited number of these groups and to assign to each a member of the teaching body. It is even more important to open the membership to any pupil who feels impelled to render service regardless of his rating in classroom conduct. Too often, the "bad" boy is excluded from participation in such activities. Membership in a service league must never become a reward for the "good" child for there is no surer way of killing the spirit of unostentatious service and introducing a fatal priggishness. It is well to establish graded ranks, similar to those in the scout organizations, in recognition of the degree and quality of service rendered.

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QUESTIONS FOR DISCUSSION

1. Give instances, from the lives of lawyers, doctors, ministers, nurses, that illustrate the truth of the statement: knowing the right does not insure doing the right.

2. Recall instances from your own life, in chronological sequence, which substantiate the statement that power of social control is a cumulative product.

3. Show how the following devices and agencies tend to build up a school spirit:

- (a) whole-hearted teamwork among the faculty
- (b) group activities like assemblies, pageants, dramatics, athletic meets
- (c) school cheers, slogans, songs, colors, and flags
- (d) situations that arouse common loyalties

4. What devices, often used to arouse school spirit, should be condemned? Give a reason in each case.

5. "Make the pupil feel more than passing pride in his school; lead him to believe that his school is the best; his teacher, the best; his teams, the best. That is my formula for arousing effective school spirit." Do you approve of the method used by the principal who is quoted? Give your reasons in full.

6. "Only as we give athletics, interschool athletics, a very prominent place in the life of the school can we develop a school spirit that sweeps on to success." What practices in contemporary education seem to substantiate the position taken by the author of this citation? Is interscholastic athletics the most effective means of developing a wholesome school spirit? Why?

7. Give instances in which a pupil's offense is interpreted as a personal affront rather than as an injury to the class. What do you consider the most effective punishment for a pupil whose misconduct clearly lowers the reputation of a class?

8. Pupils in a given school exhibit a tendency to shake off all control during school meets.

- (a) What are the probable causes?
- (b) What remedial measures would you adopt?
- (c) Assuming that you secured order by having the entire teaching staff police the next meet, would you consider this problem successfully solved? Why? How long would you continue your efforts?

9. Name at least ten classroom activities that should be routinized. What are the justifications for establishing any routine at all? What cautions must be borne in mind in routinizing class procedure?

10. Distinguish positive from negative conduct. What forms of positive conduct, other than those mentioned in the text, may be held up to pupils for their imitation?

11. "He who obeys the ten commandments and all the laws of the land is not necessarily moral; the most that can be said for him is that he is not immoral." Do you agree with the standard of conduct implied in this quotation? Why?

12. In the average school, a child's conduct rating is determined by his ability to refrain from violating school regulations. What are the outstanding weaknesses in this method of rating conduct? What improving changes would you make for determining conduct ratings?

13. Assume that you are in charge of a Grade IV-IX school having 24 classes. Plan a self-government system and outline the main provisions of the governing charter.

14. The text suggests the need of preparing pupils and teachers before instituting a self-government scheme. Outline the preparatory work which the principal must undertake with (a) pupils and (b) teachers before establishing pupil self-government.

15. A principal encourages pupils of the junior high school to formulate a series of regulations for their own guidance and for the control of grades IV, V, and VI. Is this a wise practice? Why? Who should administer these regulations, a committee of junior high-school pupils, or representatives of Grades IV-IX, or a committee of teachers? Give reasons in full.

16. Consider carefully the gains attributed to a system of self-government. Which are psychological? Which civic? Which administrative? Which of these gains seem overstated?

17. What reasons are given in the text as explanations of the gradual secularization of education? Give specific illustrations, taken from history, of each of the so-called abuses of denominational religion.

18. Explain, with specific illustrations:

(a) Rationalized conduct is relative and selective because it is opportunistic.

(b) Our intellectual processes are mendacious. They lead us to formulate justifications for what we want to do, as well as for what we ought to do.

19. Which statements embody the true cause of continued divorce between secular public education and denominational religion :

- (a) There is a growing indifference to formal religion
- (b) Denominations have failed completely to agree on what should be taught
- (c) Many parents fear that their own dogmas will not be taught
- (d) The American people are intensely devoted to the principle of separation of church and state
- (e) Church attendance is persistently falling off

20. Explain, with reference to specific instances taken from biography and science, the reason for the belief that our increasing knowledge of science intensifies genuine religious convictions. Give instances which seem to establish in the minds of other people a distinct conflict between religion and science. Try to formulate your own position in this vital situation.

21. "Teach the lives of Buddha, Confucius, Mohammed, Moses, Isaiah, Amos, Jesus, and Luther, and you have taken the strongest means of combating the evils of narrow sectionalism." Do you agree with this advice? Why? Would you omit any of these religious teachers? Which? Why?

22. Assume that a plan has been formulated whereby religious instruction, by the leading denominations, can be given in close cooperation with the public schools of your community. What administrative and pedagogical problems would have to be solved before the plan should be permitted to get under way?

23. In a particular junior high school, students exhibit little interest in assembly exercises and are prone to create disorder. (a) What are the probable causes of this attitude by the pupils? (b) Submit a list of suggestions designed to evoke a more favorable reaction by the pupils.

24. Make a list of five clubs that are appropriate for a school that you know well. (a) How would you bring these clubs to the attention of those most likely to be interested? (b) Plan a program of work for each of these clubs.

PART IV
EDUCATION AS ECONOMIC
ADJUSTMENT

CHAPTER XI

THE MANUAL ARTS IN EDUCATION

The Tool in Civilization.—When ancestral man discovered tools and learned how to use them, he took a most significant step towards the realization of the ultimate civilization which humans may attain. How this momentous discovery was made we do not know. Some think it was mere accident. Others believe that man shaped implements in imitation of the parts of his body: the hand with the clenched fist suggested the hammer; his front teeth served as the first model of a chisel or wedge. Conjecture is rife and will be renewed with our increasing knowledge of the past.

With tools, man built himself a home that gave him better shelter and greater protection. With tools, he could modify his food so that it served his peculiar needs more effectively. With tools, he was enabled to make himself clothing and weapons for fight and defense. And not the least significant of his new accomplishments was the control of natural forces beyond his own strength. The hammer, the wedge, and the prying stick or bar enabled him to multiply manifold his own lifting and breaking power. The history of tools is an essential part of the history of civilization. Education that fails to include the story of tools and to develop techniques required for their use is indeed deficient.

Important Terms Defined.—Before we begin our discussion of the manual arts and vocational education we present the commonly accepted meanings of basic terms. *Vocational education* refers to the total experiences provided by the school to teach an individual how to participate in an occupation that is both gainful to himself and serviceable to society. This conception of vocational education is formal and restricted. One may learn much that is vocationally useful in the in-

formal experiences of everyday life. While the school is not the only institution that gives vocational preparation, it is the most economic agent that modern society has for guiding an individual to a realization of his inevitable vocational destiny.

Manual arts is a term that is synonymous with manual training and refers to those school experiences which give knowledge of the most useful tools and materials and which develop skill in their use without reference to ultimate occupations. In his manual arts the child learns to work with wood, iron, brass, leather, and textiles; to cook, to sew, to design, and to draft—to do useful things for himself.

The term *prevocational* is comparatively new and is used to designate courses designed for “try-out” or for “vocational finding.” Prevocational courses give not a full training for any single trade but rather an introduction to a number of different kinds of trades in the hope of discovering the distinctive abilities and interests of a pupil. While prevocational courses are intimately related to the practices in specific crafts, they avoid training for any one of them. In the discussion of the junior high school, the reader will find illustrations of prevocational courses and a more detailed analysis of their content and their objectives.

Cultural vs. Vocational Courses, the Old Dualism in Education.—The distinction between vocational and cultural subjects which formal education has so long sought to maintain has consistently failed to meet every practical test. The study of English literature in college is considered cultural. What if the student intends to teach English and will use this knowledge in earning his living? The study of the gasoline engine is considered vocational. What if the student is not intent on becoming an engineer or an automobile mechanic, but applies himself to his laboratory tasks because of his desire to understand the common applications of physics, mechanics, and chemistry? An ingenious instructor can give a very helpful course in physics by leading his class to understand the principles of the steam engine, the gasoline engine, the hydraulic pump, the radio, and the victrola. Every law

of physics that college students should understand and remember is well expounded and illustrated in this project course. Shall we call this a cultural or a vocational course in physics? Is it the content of the course, or the objective of the student, or the method of teaching that makes a course cultural or vocational?

The conflict between cultural and vocational functions is artificially stimulated. Culture and vocation are mutually supplementary activities in a well-balanced life. A daily routine that is excessively vocational leaves neither time nor inclination for living; a life that is given exclusively to cultural activities makes for the most part consumers who do not produce. Few are fit to be "idle singers of an empty day." The sooner we recognize that these two functions are not antagonistic nor discrete experiences, the sooner will we grasp the fundamental unity that must pervade all of education. Preparation for earning a living, surely, is not all there is to education, for life is bigger than making a living; but neither is preparation for passive understanding and appreciation of life the beginning and the end of education, for again life is essentially active and productive. In this section we shall concern ourselves with the problem of making education as vocational as life itself.

The Psychological Justification for Manual Activities.—
Sensory and Motor Centers.—The nature of our mental responses leads us to recognize two brain centers. The first is the *sensory-intellectual center*, that runs from the end organ, the retina of the eye, the inner ear, the cuticle, etc., along afferent nerves to the cortex or the surface of the brain. The sense organs thus become the gates to consciousness. At any one moment there are countless stimuli, sounds, lights and shades, colors, odors, vibrations, thermal and pressure changes—all knocking at these portals, seeking admission; but only those that are strongest succeed in gaining recognition. This *sensory-intellectual center* gives the individual his knowledge of the environment in which he lives. The vibrations and stimulations that impinge themselves upon us have meaning only as they are interpreted by this *sensory-intel-*

lectual center whose mental functions make us conscious and thinking beings.

But merely possessing the power of recognition and understanding is not enough. Action must follow. This is accomplished by a second center, the *motor center* of the brain. Through its direction, stimuli which are brought into the brain are changed into impulses and are sent from the cortex or surface of the brain along efferent nerves to their respective muscles and glands. Desired ends are thus achieved. This second center makes man an acting as well as a thinking being, and insures active judgment of his environment.

The Functions of the Two Centers Constitute the Function of Mind.—It is seen that one center receives all the sensations from without and interprets them; the second directs the responses that follow our ideas. A complete education must not rest content with training the sensory center, the interpreting functions, alone; it must strive to develop the will as well, for only then can the individual become self-directing. A mere thought is useless. Thinking that ends in thinking, and does not become action, is sterile. A thought that remains a thought has no social significance. Only when the thought leads to action, can it become social and have social significance.

Danger in the Traditional One-Sided Sensory Education.—Thought for thought's sake is a vanity as empty as it is pompous. Thought must pass over from the sensory-intellectual center to the motor-intellectual center, unless thought and deed are thoroughly interrelated, an individual cannot become thoroughly responsible. The person who thinks good thoughts, but never acts a good act, is a well-intentioned Hamlet. An idea without a motor side is useless. But those whose actions precede their ideas are the "fools who rush in where angels fear to tread." The well-balanced person maintains a nice equilibrium between thought and deed because his motor and sensory centers act in harmony.

The two centers, sensory and motor, must be so adjusted that the former harmonizes with the latter. When the action has no direct nor intimate connection with thought, irresponsibility

is developed to a degree that causes us to classify such individuals as defective in mental and moral adjustment. The most effective training for such children is through manual experiences; we must appeal to them through action until we establish such a coördination between their sensory and motor centers that control develops.

These two centers are so completely interrelated that they form mutually dependent elements of a complete thought. An idea seems to have two phases, an ideational phase and a motor phase; no idea is complete without either. Our likes, dislikes, surprises, disappointments, disagreements, resentments—all these express themselves in changes of facial expression, changes in rate of heartbeat and respiration, in changes in quantity of perspiration, and even occasionally in interference with digestive processes.

Genetically, conduct seems to develop through three stages. First, the child's action appears to be an expression of impulses mainly, but not wholly, physiological in origin. In the course of time, the child learns that its actions are not always successful, in fact, certain modes of response invariably fail to bring satisfaction. As success and failure are repeated, the developing mind learns to pause, if possible, at each impulse to action in order to select or reject—in a word, to think. Conduct is now in its second stage, the impulse-idea stage. But evaluating the possible outcomes of an impulse tends to produce conduct that is rational, hence the third stage, responsible action is attained. The sequence of the links in the chain of conduct seems to be: impulse—idea—action.

A young child first experiencing the impulse of locomotion makes various movements, some of which end in utter failure, others, in partial or complete success. For a little while, the original forms of response seem to be repeated. Then we observe unmistakable preference for certain movements like those of locomotion, and the avoidance of others. We have learned enough of conditioned action to understand that the child does not make a list of all his attempts to crawl and then consciously classify them into desirable and undesirable responses. The nervous system makes the selections and the

rejections. The result is a more successful outcome of an original impulse.

Let us turn to another illustration: the elementary-school child or the high-school student who enters the school shop or the laboratory. The impulse to touch and to handle tools and apparatus, and to do without planning, frequently leads to failure. In a little time, the pupil learns to check his impulses, to plan, and to try to forestall the conditions that militate against success. His thinking may not insure success, but it makes his line of conduct reasonable and deliberative.

By its practices, the school tends to cut off action from the impulse-idea-action series, thus depriving the learner of the very experiences that induce initial thinking and that are well designed to refine ideas. As a rule, examinations measure knowing even when we are most eager to ascertain an individual's capacity to perform specific functions. The best tests given to candidates for teachers' licenses measure what the applicants know rather than what they can do, and yet our chief concern is to ascertain the quality of their classroom performance.

Motor Education Must Initiate the Child into School Work.—It follows that at least early education should be physical, that the first two years of the school should be intensely manual and motor. One would, therefore, *a priori*, prescribe clay-modeling, weaving, pottery, woodwork, paper cutting, sewing, drawing, dramatization, much supervised play and singing and the like. But, in their stead, our educational systems place the child in a stationary seat and begin number work, reading, spelling, recognition of written words, letters, or figures—work which is primarily mental rather than motor. The child is not interested in the spelling of *tent*, *ox*, *arrow*; the creation of these fascinate him. To meet this natural instinctive love for activity, some educators have organized an early curriculum which leads the child to recapitulate the reputed stages through which society has developed. The first year, Indian social life is reconstructed in all its details from the story of Hiawatha. The tent, the fire made by friction, the cave, the pot, the crude pottery, the dress, the

weapon—all these are learned and studied, not in spelling or reading, but through actual creation. The sandhill affords an excellent opportunity to lay out a community of tents, a pond, a spring, a forest, a mountain, or a valley. The boys build the stakes of the tent with twigs, the girls cut the cloth to make a covering. In the clay-modeling class the children make pots and vessels used by the Indian; in their sewing class the girls reproduce the costumes. Training in color perception and design is afforded by having children select proper colored ribbons and imitate the original form of design. Weaving is taught as the children make crude rugs, baskets, and Indian carriages. Drawing is introduced very naturally. The children draw those things that they wish to create, and thus give free expressions to their ideas. All the work of the first year is designed to utilize the natural instinct for activity and to strengthen the motor areas that need development. Such school work which takes its cue from the inherent cravings of the growing mind interests children to the point of fascination.

Principles of Teaching the Manual Arts.—1. *Technique Must Not Be Exalted.*—How intelligent does this kind of manual training appear when compared with the prevailing formal lessons in which children make little articles, all too simple, and usually useless as far as the pupils are concerned. Children fold paper into chairs, tables, and boats, but they no more look like boats, chairs, and tables than like houses or birds. How stupid to find children in a first-year class in cord and raffia work engaged in exercises which illustrate one principle or another. The manual-training syllabus may prescribe for the first grade “exercises in knotting, single, double, and triple knots, and the chain stitch.” No child cares about the kind of knots or stitches; he wants to make an article that he needs. When the child is most interested in the result, we show him a principle. Thus a first-grade drawing course tells the teacher to pay attention to “mass, proportion, placing, and direction of line.” The first-year pupil takes keen delight in drawing a picture in which he expresses himself without regard to the rules of “mass, proportion, and

placing." Let him draw pictures of objects and of people that interest him most; the result, however crude, is an expression of his ideas. How absurd to find children in introductory classes, drawing a sheet full of lines, in their endeavor to get proper shade and direction. A sewing syllabus should not introduce the subject with exercises in elementary stitches. Why should the child most eager to achieve a product be required to sew together bits of cloth in order to learn the kinds of stitches that constitute elementary technique? And yet undue emphasis on technique is surprisingly common.

All these exercises are deadening for they extol technique and lose sight of the product which really motivates the whole process of creation. The curriculum must teach, first, the creation of objects, then the principles underlying them. Let the child draw something that he wishes to express, then show him that his proportions and his lines are bad. Let the little girl begin her sewing by making something she needs, then teach the necessary stitches in the course of actual creation. Let the child begin his cord and raffia work by making a napkin ring, or a picture frame; then, in the course of constructing the article, teach him the principles of knotting and weaving. It is the outcome that the child wants; the process, at best, is a thing to be endured.

2. *Maintain a High Standard of Technique.*—It must not be inferred that we counsel teachers to permit slovenly technique because the child is eager to achieve a product. The very focusing of attention on the thing to be created, serves to raise the quality of work. The child sees that careless workmanship produces an ill-fitting picture frame or a boat with a persistent list. Even very young children see clearly that their failure with its attending waste of material and time is due to their lack of skill. In making their next object, they are prone to be more attentive to matters dealing with technique, to exercise greater care at each step, and, not infrequently, to chisel down a bit of scrap wood in order to develop a little expertness before applying the chisel on the partly completed boat. In all the manual arts a high standard of skill must be maintained, so that children later bound for

industrial vocations will acquire a set of valuable preparatory habits of work. The attempt to separate, completely and severely, manual training from industrial training always proves a dismal failure, for it robs manual training of its vitality and fails to impress upon teachers that one purpose of the manual arts in the elementary grades is to discover those that have aptitude for mechanical pursuits. True, Germany of 1914 developed its industrial education without an adequate program of manual training but, this fact, though often quoted, does not indicate that we must follow that procedure.

Manual training has suffered from the old disciplinary conception of education implied in the very term, *manual training*. It was assumed that the muscles of the hand would be trained by exercises in the carpentry shop or in the sewing room and would thus produce a hand ready to perform any skilled act. While it is true that the hand can be trained to use a pen, a brush, a saw, a chisel, and a needle, we have no evidence that skill developed with any one of these tools makes us equally skillful in the use of very different tools. Will practice in straw-weaving or piano-playing make us more skillful in using a jig saw or in typewriting? The disciplinists assume a direct and unlimited transference of skill; the educational psychologists have found no proof to support this assumption of unrestricted transference. We must conclude, therefore, that the manual arts must be closely related to the common vocational activities for which the school can give preparation so that pupils' performance in the manual arts will be an invaluable aid in vocational guidance.

3. *In the Higher Grades, the Manual Arts Should Approximate the Standards of Industry.*—It is well, just as soon as children are mature enough, to introduce them to the practices and exactions in the actual manufacturing world. The tools should be real tools, not toys. The materials should be real, not imitation. If books are being bound, real book linen or leather should be used. The value of the finished product should be computed in terms of labor and material costs, overhead expenses and reasonable profit. The closer

we approximate the conditions of the business world, the more genuinely do we motivate the task for pupils.

4. *Repair Activities of the Most Common Forms May Be Included in the Manual Arts.*—The disciplinary values of manual training are intensified by making the specific tasks as utilitarian as circumstances permit. So long as a pupil is working on a mere exercise, he does not really understand the need of utmost care in all his measurements and the significance of exactness in every movement. But a very different attitude is automatically assumed while the pupil is working on a real job. The manual-arts courses should include simple furniture repairing; making of screens, and window boxes for flowers; repairing of windows, doors, and locks; minor plumbing and heating repairs like replacing a worn-out washer in a faucet or opening the trap beneath a kitchen sink; simple electric repairing and wiring, like fixing defective door-bells and buzzers, or worn electric cables of floor lamps, or electric irons; making very simple repairs in machines like a sewing machine, a phonograph, a radio, a bicycle, or an automobile. In tasks of this sort, the child learns more than manual processes. He acquires, informally to be sure, no mean stock of science facts which serve him well, later, in his course in physics.

The Educational Values of the Manual Arts.—Manual training is educative because it develops a higher degree of *coördination between mind and body*, not through play and gymnastics which strain the large muscles, but through the intelligent and purposeful use of the small muscles in the creation of socially useful objects. By insuring adequate motor activity, learning is quickened and made more effective.

In the manual arts the child develops *skill in the use of tools* and acquires helpful *knowledge of materials*. He can apply his manual dexterity and his information to advantage in various ways in his home and in his recreation. His stock of general information—geographical, arithmetical, and scientific, is slowly and informally but consistently increased. He is thus rendered less dependent on his elders.

The manual arts, properly taught, present many pressing

and interesting problems. These, the young worker must solve. Each problem requires the recognition of a basic difficulty, the search for causes, the determination of a line of action and finally, the test of successful solution. Truly, an effective training in *thinking in mechanical experiences* is assured by a well-planned course in the manual arts.

The school course that provides rich variety of manual arts gives youth a wider and more *intimate insight into the industrial world* and thus helps the child to make a more intelligent choice of his vocation. Each new manual art widens the child's experience and places him in a more understanding relationship to his fellowmen.

We must never permit ourselves to regard manual training as an activity which is in any way opposed to purely intellectual training. Its service in educating youth is genuine and invaluable. Manual training is truly "mental training through the hand."

Well conceived and properly supervised activities in the manual arts inculcate attitudes towards work and life that become vital character traits. *Habits of accuracy, neatness, and painstaking concern* with a manual task are soon developed. The child who is "almost right" in composition, history, or geography, has done commendable work. No such loose standard can be tolerated in the manual arts. The parts must fit absolutely and the measurements must be accurate to a fine degree, otherwise the results are imperfect and perhaps worthless. But it must be remembered that accuracy, neatness, and care will be exercised by children only when they create something useful. These qualities are evoked only when there is a motive for them. The child who is sewing on a bit of cloth making nothing, merely practicing different kinds of stitches, usually does not do neat and accurate work. What need is there for these qualities? The same child shows infinitely more pains in making a dress for her doll. A formal drill lesson in penmanship is usually not an exercise performed with care. Blots, erasures, unsymmetrical strokes, and other evidences bespeak the child's carelessness in the unmotivated drill. We adults are not always neat for the sake of

being neat. Children are actuated by the same motives in their own work as adults are in theirs.

Concentration and close application are other attitudes which manual training develops. Children spend long periods at their manual work, and give themselves completely to their tasks. They learn to concentrate until all obstacles are overcome and they triumph in actual execution.

Self-confidence is another character gain of this work. In manual arts children often resent any interference or even an offer of help. This attitude leads to greater accomplishments in the future.

Opportunity for free and ready mutual help is an absolute essential in manual work. In no other lesson is a classmate's aid so often sought. Children are constantly seeking their neighbors' opinions and help: "Is the line straight? Will you help hold the wood as I cut it? Will you allow me to use your chisel or scissors?"—these are a few of the necessary requests one hears. No good manual-training lesson can be given without permitting the children to talk; no school shop should have such discipline as will make the giving of mutual help and suggestions difficult or impossible.

It is the hope of many that manual and vocational activities will develop in young children a wholesome respect for labor. We may explain the importance of manual labor and in its praise cite its noble participants. Children listen as we tell them that Moses was a shepherd; that the Prophets each worked at a trade; that Jesus was the son of a carpenter; and that St. Paul was a tent maker. But they are not necessarily convinced. Talk is never as effective as having teacher and children spend a period or two a day in the shop, working together with sleeves rolled up and arms bared. Manual training may establish a bond between children of different classes and therefore of different outlooks, and thus teach simply, honestly, and convincingly the true *dignity* which must crown *manual toil*. But the hope, "The two classes of society, labor and capital, united at the root, will never, therefore, grow asunder"—though noble indeed, seems far too ambitious to be achieved by manual education.

Another desirable ethical gain is the acquisition of a *property sense*. The proprietary feeling, the right to property, the security of ownership of what is truly and honestly one's own—these are basic in our social organization; they have called into existence most of our laws and machinery of social control. The child who has produced something by giving to it his skill, his personality, his patience, and his time taken from play, feels that the object created is in every sense his own. Those who experience an honest sense of ownership have the necessary respect for the property of others. This property sense is an essential element of the moral equipment that we must give our children.

A Necessary Caution.—We must grant that these attitudes are fostered by the manual arts and that they constitute important character traits. But we may go too far. Enthusiasts of manual training insist that their specialty insures an education in truth. The argument runs about as follows: in the manual arts the child learns definitely and unmistakably the need for exactness in the physical world. This conception the child carries over to his relations in the social world. Truth becomes another form of accuracy, and falsehood, another form of inaccuracy. Let us quote from Felix Adler:

It is true, there are influences in manual training favorable to a virtuous disposition. Squareness in things is not without its relation to squareness in action and in thinking. A child that has learned to be exact, that is, truthful, in his work, will be predisposed to be scrupulous and truthful in his speech, in his thought, in his action.

Both psychology and experience refute such broad claims for any school subject. We know full well that truth and exactness vary with the nature of an experience, hence truth in manual work is not truth in social action. Accuracy in manual work is no guarantee of accuracy in social relations. It is the exaggeration of the importance of any one idea that has made the educator a popular source of humor and has tended to discredit his position in practical matters. Does

the very accurate automobile mechanic carry over his sense of "physical truth" when he makes out his customers' bills? Manual training is important and far-reaching in its educational influences, but it is not the center of the educational firmament nor will it usher in a new moral era.

SUGGESTED READING

See end of Chapter XIV, Page 317.

QUESTIONS FOR DISCUSSION

1. Trace, in a general way only, the development of tools from the earliest evidence of their existence to the dawn of the modern industrial age. Where will you find the necessary data? Show the influence of tools on the social and economic development of man.

2. What is the difference between vocational education and manual training? Between prevocational and vocational education? Give illustrations.

3. What is the usual distinction between a vocational and a cultural course in, say, science? Show that the attempt to distinguish cultural from vocational courses by the objectives of the students, or by the methods of teaching, or by the content, all fail to maintain the historic dualism.

4. Give instances from present classroom practices which support the indictment that present-day education is more sensory than motor. What changes would you make, to insure the teaching of the same content, but through motor rather than through mental experiences?

5. Give illustrations from your own school life to illustrate the following:

- (a) Manual training too often exalts technique
- (b) Manual training is too often satisfied with standards of technique distinctly lower than those permitted in industry
- (c) Manual training is too often taught by dictation of specific directions rather than by attacking a real problem

6. What is meant by the disciplinary conception of manual training? To what extent may the skills developed in one of the manual arts be transferred to other manual experiences? Will the child who has learned to be accurate and painstaking in sewing be ap-

proximately as accurate in clay work, in drawing, in cooking? What evidence can you present in support of your contention?

7. Give reasons to support the statement: "Manual training is essentially mental training."

8. What personality traits may be cultivated by a properly taught and properly administered program in the manual arts?

9. Are there conduct traits which distinguish working boys and girls from those who remain in school? If so, name them specifically.

10. We are often told that many who have been trained in trade and technical schools do not follow the calling for which they have been prepared. Granting the fact, does this training that is not actually used in earning a livelihood represent total loss of time and effort? Does either society or the individual realize anything on the investment?

CHAPTER XII

SOCIOLOGICAL AND ECONOMIC ASPECT OF VOCATIONAL EDUCATION

The preceding chapter, although devoted to the manual arts, outlined the psychological justification, not only of manual training, but also of vocational education of the manual type. In this chapter we shall concern ourselves with the sociological demands which our age makes for an extension of the manual arts into a rational program of vocationalized education.

Changes in Education Prompted by Modern Economic Life.—*Education Changes with Society.*—Progressive education constantly adjusts itself to new conditions lest it become static and worthless. Civilization has just entered upon a new epoch, industrialism. What does that mean for education? In the near past the seat of manufacture was in the home. Spinning, weaving, nail-making, candle-making and the like were domestic industries in which everybody in the household helped. The implements were few and the processes all simple and performed by hand. In one short decade there came a great influx of machinery, and with it, the application of water, and later steam power. Machinery had to be collected under one roof; the place of manufacture had to be located where water power was convenient, or where transportation facilities insured ready supply of coal and raw material and cheap shipment of finished products. Hence, those localities which were naturally favored with water power and which were readily accessible were made the centers for these new factories with their machinery. Industry left the home and was concentrated in the new centers, the towns. Those who wanted work had to leave their old rural homes and establish new ones in the industrial towns and cities.

The Social Significance of the Industrial Revolution.—

Under the old system of domestic manufacture there were distinct processes that required male strength. With the earliest machines, the output was greatly increased but male brawn was required to operate heavy iron levers and crudely geared wheels. But when the power of the steam engine was harnessed to the machine, mere human strength was no longer a decided asset in production. Even a child, by pulling a handle, could set countless machine wheels in motion. Hordes of men were sent out of factories and their places were taken by greater hordes of women and children. We need not stop here to review the exploitation of female and child labor, the heartless subjugation of labor, the tyranny of the machine, the rise of labor unions, and the beginnings of social legislation that slowly built up a system of laws to protect the weak and the young from the rapaciousness of early industrialism.

The Urbanization of Population.—One of the most important results for education which followed the inauguration of this period of industrialism is the world-wide city movement. It is estimated that at present about half the population of the United States is urbanized and that within a relatively short period, about sixty-five per cent of our population will be found in cities. Education must move with population. It must change its character, just as the character of our lives has changed in shifting from the natural center, the country, to the artificial center, the city. If the individual has suffered significant losses in the movement of population, education must offer compensating opportunities. A brief survey shows us that the present-day city life imposes at least three serious disabilities on its youth.

The Educational Loss of the Urban Child.—The city child has lost an opportunity for natural work and play in a healthy environment. Contrast the country and the city child in this respect. The country boy can ride a horse, harness a team, run a gasoline engine or drive an automobile; he can use a hammer and a saw, and is familiar with the use of various kinds of woods; he has seen the various vegetables grow from seed to ripening; has aided in plowing, harrowing, planting, hoeing; he can scale a fence, climb a tree, aim a rifle;

he knows the names of dozens of trees, birds, flowers; he knows the common animals, their habits, and their haunts. His whole life seems to be motor and outdoor. The city child is denied all these natural forms of motor training. Education must, hence, seek to make up this deficiency, to give back to the city child what industrialism has taken from him. It is for this reason that many kinds of industrial arts and nature study have been introduced into present elementary curricula. The girls are given such work as is suitable for them—cooking, housekeeping, sewing, weaving—the domestic arts. Manual training, in all its forms, was therefore added to our present course of study because the environment has changed; education, in its endeavor to be a dynamic and progressive force, has changed to meet life's new needs.

The second loss which the city child has sustained by the modern trend in the redistribution of population is the lack of knowledge of the *use* of materials. The city child may come into contact with more materials than the country child, but these are invariably in a finished product, rarely in their raw state. Because of the opportunities for motor work, the country boy knew the use and the qualities of wool, of cotton, of hemp, or flax; he knew the different kinds of earths and sands, the common kinds of rocks, the various kinds of wood; he knew which wood to select for a floor, which for a ceiling, what is durable, what is perishable; he knew the secrets of nature's gifts. City children are woefully ignorant of these things. Few fifth-grade pupils knew the difference between brick and rock and none knew the difference between sand and soil. "Dirt" is the generic term they use for both sand and soil.

To make up for the knowledge of things, city education of 1885-1910 introduced the now defunct *Object Lessons*. These were fortunately short-lived in America. The teacher taught all about coal in one lesson, about wood in another, and some other unrelated material in the following period. Children were told to observe and then tell what they saw; then the teacher pointed out what they did not see. Each grade usually repeated the work of the preceding one with a

depressing regularity. The curriculum sought to give the city child a knowledge of materials but those lessons were artificial and therefore proved useless. To know the uses and characteristics of materials we must use them; mere observation gives a superficial knowledge of sensory qualities. The untrained observer sees not only what is useful but also what is useless.

In *School and Society*, Dewey reports a lesson well designed to give children a knowledge of materials commonly used. A class of girls, about twelve years of age, was engaged in weaving some useful article with threads of wool. Before the work was begun the teacher pointed out that in a previous manual-arts lesson, threads of cotton were used. The two materials, cotton and wool, were compared. The observations were directed by a few questions, and the children noted that cotton grows in small threads, while wool comes in long ones; that cotton is smooth and therefore its threads do not adhere readily to one another, while wool is rough and its threads cling easily; that cotton is difficult to extract from the pod by hand, while wool is combed easily without mechanical contrivances. The pupils concluded that our ancestors wore wool rather than cotton, but that the inventions of the cotton gin and machinery for the manufacture of cotton goods overcame these natural difficulties. Here we have a manual-training lesson giving food for thought. The children had an intelligent idea of the relative merits of the two materials because they were using them. No object lesson can bring out these qualities so naturally and so vividly.

The third great loss which the city child must bear is lack of a variety of work after the elementary-school period. The country boy who must leave study at the end of the elementary school finds some form of employment that offers variety—farming, store-tending, lumbering, teaming, housebuilding, or automobile repairing. The organization of rural industry is not intricate, and its division of labor is not minute. The work offers opportunity for the expression of initiative. While all labor, except the most skilled, tends to become monotonous, rural industry is less mechanized. Farm life, with its lack

of recreational activities and limited social relations, not farm labor, makes rural life monotonous. The average city child, on the other hand, who leaves school must go either into an office, or a factory, or, worse, into a blind-end activity like running errands or wrapping parcels.

Educational Gains of the Urban Child.—We must not allow ourselves to believe that the shift of population from country to city brought the urban child no compensating gains. The city has the wealth that purchases opportunities. We find, as a rule, that city school children have a lower index of physical defects than their cousins in country schools. Medical examinations, clinical facilities, and follow-ups are more readily organized by the city. Standards of teaching, school equipment, and quality of school supervision are all usually better in urban than in rural communities. The city is vastly richer in the total opportunities it gives youth, in dramatics, in art, and in music. The number of charitable and ameliorative institutions usually found in a city, give no little aid to the physically and the financially handicapped. And finally, we must add the advantages which come from the variety of social contacts which the city makes possible. Not all people respond to nature and grow in her environs; many are stimulated by human conflicts and by competition and coöperation with their fellowmen.

Justifying Public Support of Vocational Education.—*The Vocational Predicament of the City Child.*—We pointed out that the highly organized industry and commerce of the city hold open, for most of those who leave school, immediately upon the fulfillment of the requirements of the educational laws, nothing better than office, factory, and blind-alley forms of employment. In the highly routinized office work, the child is assigned to a specialized semiclerical and semimessenger service at a fairly good wage. He soon becomes proficient in the simple task. After a few years he reaches the maximum compensation for this type of labor. As he becomes older, his wage, originally attractive, becomes inadequate for his needs. Unless he can enter the selling or managerial forces, he has no vocational growth. He leaves his job and sets out in

search of something else. What has he been prepared to do? He looks for anything promising and usually finds nothing. He has no trade and changes from job to job. Manual trades, he regards as beneath the false dignity which so frequently comes with clerical labor. What is he? What is he fit for? For what kind of living has education adjusted him?

Of blind-end or blind-alley labor in a city there seems no end. Messenger service, delivery boys, bill clerks, shipping clerks, switchboard operators, office boys and girls, parcel wrappers, addressing operatives—all these tempt the youth leaving school by fairly good initial wages and simple demands of skill and knowledge. But what do these forms of labor lead to? If the boy and girl enter any of these at the age of fourteen or fifteen and remain for four or five years, what will they be at nineteen or twenty? They learn, too late, that they entered a blind-alley that leads to an insurmountable wall.

Too often the vocationally untrained youth finds the factory calling him. Our whole modern factory organization is based on the principle of division of labor. The greater the number of processes in the manufacture of an article, the more economical does its production become. A shoe passes through 70 or even 130 separate processes, 70 or 130 pairs of hands are necessary, but in each case the individual merely brings the shoe to the machine. Popular magazines have familiarized us with the subdivision of labor in assembling a moderately priced automobile. The various parts are machine pressed. These parts pass before hundreds of men who perform one simple operation like turning a nut or inserting a wheel. The unfinished article then goes on to the next man for his highly specialized manipulation. The individual does not reason, nor use skill, nor impress his personality on the article. He feeds the machine and then permits the unfinished object to go on its way. His actions are constant duplications; they become lifeless and mechanical. This automatic machine-tending stultifies the body and stupefies the mind. This machine worker soon becomes as stupid as the machine which he is tending. Day in, day out, the same dead, dull, grinding

monotony drags the individual down to the level of the iron monster.

We may have overdrawn the picture. Highly routinized labor may be as satisfying to certain types of personality as it is soul-crushing to others. The phlegmatic person of mediocre mind, lacking especially in imagination, finds that the repetitions do not jar him out of his accustomed sluggishness. His work presents no problems; it never challenges his mind. Here clearly is the type that need not concern us. It is the superior youth whose mind is active and whose imagination creative, that we must save from the stupefying routine of machine-tending. A properly organized program of vocational education seeks to discover those who seem fit for little more than machine labor; to explain to the routine laborer the significance of his process for the final product, and to direct those with more aggressive minds to appropriate forms of skilled trades.

Our *vocationally untrained* boys and girls who are annually belched out by the school into society enter industrial life at "its most painful point, where the trades are already so overcrowded and subdivided that there remains in them very little education for the worker." Each craft is no longer a *mysterie*; learning its processes and secrets is no longer a means of acquiring craft skill, the artisan's greatest asset, which fosters the dignity and the independence of the true worker.

What is the bearing of all this on education? The reader may have already anticipated. The school must save the child of ability and promise from the predicament of the office, from blind-alley labor, and from the soul-crushing grasp of the modern highly specialized factory. The vast majority of the school children of our country never reach the high school. An elementary education is all they receive. It is evident that the manual arts must go one step further and give each of these children a training for a vocation by which he can earn his living. If most of our children must lead business or manual lives, is it not fair to demand that no small part of their education be devoted to vocational training?

It was shown that in the junior high school, the pupil should be introduced, through prevocational courses, to the work of the carpenter, the tinsmith, the machinist, the book-binder, the milliner, the cook, the seamstress, the typesetter, the typist—a few of the many forms of skilled occupation. In addition to the actual shop or office experiences, these children should be given a liberal view of the great vocational world. Talks by teachers and representatives of business, well illustrated by stereopticon views, and carefully planned individual, group, or class visits, will give the pupils a large stock of vocational information. Aside from its value as a necessary preliminary vocational training, this work has its educative worth in presenting a series of pictures of the various vocational pursuits. This is vitalized instruction in geography.

In the reorganized plan of education,¹ the stage following the junior high school affords opportunity for specialized training in a skilled trade according to the proved ability of the pupil. These crafts are all higher than mere machine-tending. They demand a mastery of a special technique, control of muscle, exercise of judgment, and ability to meet new problems. This specialized training is the just heritage of our abler children who are bound for industry and commerce.

Let us examine a typical instance which reveals our astonishing unwillingness to look a situation squarely in the face. A teacher in a large city school had in her eighth grade, forty-six girls. She knew that at least forty of them were bound for some remunerative occupation just as soon as the law permitted. Every girl in the class knew it and the parents, in their broken English, made this plain. No extensive survey of the neighborhood was necessary to understand the great economic pressure under which these girls lived. What was the teacher doing, in the face of these facts, to help the girls meet the situation which awaited them? Precisely, what any faithful public school teacher does—teaching as effectively as she knew how, and spending herself without stint,

¹ See Ch. viii, page 171.

but, at all times, following the course of study. In arithmetic, always the first subject of the day, these girls were learning mensuration and were becoming adepts at finding the areas of parallelograms as well as triangles. The teacher's plan book showed that stocks and bonds would be taught after the girls learned to find the area of a circle. In reading, these children were struggling heroically with *The Lady of the Lake*; in grammar, they were worried by the predicate noun and adjective; in geography, they were learning the products of India; in history, they were refighting the French and Indian War; in the cooking period, they were learning to prepare foods that very few, if any, would be permitted to prepare in their home kitchens, presided over by their mothers.

A canvass of the class showed that fourteen were going into shops after graduation to learn "how to work on men's clothes"; six hoped to get "cash-girl jobs in an apartment store"; eight were going to apply for "parcel wrapper in the five and ten"; nine were making application for admission to high school. An intelligence test and a few standardized achievement tests showed a wide range of distribution of ability among these girls. Yet we go on with the traditional pabulum fearful lest we do violence to culture. What a genuine guide to life can the school become to this group! Why should the system permit superior children to go promiscuously into parcel wrapping and selling in the "five and ten"? Why should not the education given these girls bear a direct and vital relation to their ability and their inevitable occupations? Small wonder that certain critics of our schools insist that what education needs is not more time and more money, but a reapportioning of its time, a reorganization of its curriculum, and a wiser use of the financial support it now enjoys.

Economic Conditions Make Vocational Education Especially Necessary To-day.—Rarely has any type of education evoked as much popular interest as vocational training. Labor unions, employers' associations, and officials of the army and the navy have given earnest consideration to it. The federal government grants no mean subsidy to the several

states for the promotion of vocational education. The causes of this popular interest in, and public support of vocational education, are many and vitally interrelated with our whole economic organization.

1. *The Home Is No Longer the Seat of Industry.*—The industrial function of the home under the domestic stage of manufacture is now almost completely transferred to shop and store. Another agent, better qualified than the home, is now necessary to give each individual the vocational experiences which his parents provided in a simpler social and economic organization.

2. *True Apprenticeship Is an Institution of the Past.*—The old guild system, with its long and famed apprenticeship, is now dead. No longer is the youthful aspirant to a trade compelled to pass a long period of training in his master's home. The journeyman period which followed, required travel from one industrial center to another. The years when the worker plied his trade as an itinerant craftsman brought rich and varied experience. The journeyman looked forward to the creation of his masterpiece, which when approved by the master craftsmen, was followed by election to the guild and the assumption of the status of master workman. Despite the caste system inherent in such an organization, industrial training was insured by the guild system.

Apprenticeship is a thing of the past. A study of trades in Ohio revealed the startling fact that out of 400 establishments only 60 had an apprenticeship system and only 3 sought to give thorough training. In many industries, division of labor and the introduction of machinery have so simplified the manufacturing processes as to render an apprenticeship unnecessary. In other industries, the growth of technical processes has been so rapid and extensive as to require more graded, systematic, and protracted training than an apprenticeship can achieve. Not infrequently, one finds an apprenticeship system maintained by labor unions because they are thus insured a grip on the future labor market of their respective crafts. Their concern is naturally centered in maintaining a safe ratio between journeymen and appren-

tices and not in securing for the new entrants thorough trade education.

Many who are ready to grant the need of vocational training insist that those who really need trade knowledge or technique will secure them through trade contacts. Industry has grown too technical and preparation for it cannot be left to chance or unorganized apprenticeship. An analysis of the following table² shows the changes that have occurred in industry, and thus reënforces this conclusion.

CONTRAST IN INDUSTRY, PAST AND PRESENT

<i>Industry of the Past</i>	<i>Factor in Contrast</i>	<i>Industry of the Present</i>
1. Relatively few	1. The number of trades	1. Markedly increased
2. Simple and usually handed down by family and tradition	2. Knowledge necessary for the higher forms of labor	2. Diversified knowledge gained from many sources, especially from the sciences
3. Few and usually simple	3. Tools used	3. Many and often highly specialized
4. Relatively little	4. Change in the processes	4. Very frequent to keep pace with growth of science
5. Comparatively few	5. Number of skilled workers	5. Increased many-fold
6. Little	6. Specialization	6. Very much
7. Rare	7. Coöperation of school and industry	7. In many communities very extensive
8. None	8. Part-time trade education	8. Steadily increasing

² For amplification of these and related facts, see Prosser and Allen, *Vocational Education in a Democracy* (The Macmillan Co., 1925).

CONTRAST IN INDUSTRY, PAST AND PRESENT—*Continued*

<i>Industry of the Past</i>	<i>Factor in Contrast</i>	<i>Industry of the Present</i>
9. Usually provided in skilled trades	9. Adequate apprenticeship	9. Relatively fewer apprenticeship systems and few of these concerned with giving thorough trade preparation
10. Usually the trade training of youth proved adequate for the needs of life because craft processes remained unchanged	10. Does the training in youth suffice for all of life?	10. As a rule, skilled workers need supplementary education because of the continuous growth of industry
11. Little	11. What is the greatest help the school gives those going into the trades?	11. In teaching related technical knowledge, mechanical drawing, trade arithmetic, applications of science to industry
12. Apprentice taught by master	12. Mode of learning a trade	12. Can be achieved by special schools and through well organized systems of apprenticeship

The conclusion seems inescapable: the technique for modern industry can no longer be acquired by chance. Some agency must give youth the trade training that was assured him by the guild system of old and by the apprenticeship system of more recent days. What better institution than the public school system charged with the duty of making men and women out of our boys and girls?

3. *Preparation to Meet the Keen Competition in Congested Cities.*—The growth of urban centers intensifies the social and economic competition, already bitter. City life

demands a variety of service. But there are usually many who offer to serve. Hence only the industrially fit will survive in the struggle for existence. Education that prepares for life must, hence, be as vocationalized as life itself.

4. *The Frequent Shortage in the Ranks of Skilled Workers.*—Few leading countries have a sufficient number of skilled workers. The unskilled are always with us. Many of them, capable of more intelligent endeavor, seem doomed to a life of drudgery. Inquiries have revealed the startling facts that 50 per cent of the mechanics of this country were foreign trained and that 98 per cent of the foremen in the factories of New York were trained abroad. Surely, the intelligence of America is normally distributed; proportionally, we have as many capable of becoming skilled artisans as other nations. The conclusion is certain: we have failed to train those who give promise of mechanical capacity.

5. *Conservation Through Intelligent Coöperation.*—Vocational education is not concerned solely with the matter of improving the skill of workers. It is identified with every intelligent enterprise designed to make a nation economically efficient. Vocational education must combat the colossal waste in our economic life.

It is the opinion of technically competent investigators that production in the United States can be doubled without inventing a single new machine or without devising a single improved process. Waste in production is caused by the following conditions: ³

(a) Faulty control of materials. It is estimated that "For every ton of coal produced, our methods of mining have placed a second ton beyond recovery; for every 1,000 feet of natural gas turned out, a similar quantity has escaped (into the air); for every barrel of petroleum that has seen useful service, nine barrels have been wasted . . . our best and most convenient coals will be depleted in a few decades, half our petroleum is already used up, and over half our natural gas is gone." ⁴

³ A rearrangement of the fourteen sources of waste listed in the report, "Waste in Industry," by the Federated American Engineering Societies.

⁴ Stuart Chase, *Work and Waste* (The Macmillan Co., 1925).

(b) Research in the processes of production not stimulated adequately

(c) Extensive labor turnover

(d) Seasonal unemployment

(e) Conflicts and misunderstanding between labor and capital

(f) Voluntary restriction of output imposed by labor organizations

(g) Involuntary restriction of output due to illness and accident caused by ignorance or carelessness

(h) Limited skill of the workers. We have generally assumed that lack of skill is the sole cause of waste in production

(i) Errors in judging the demands of the community

Developing the skill inherent in all workers does not wipe out the other causes of waste. The loss produced by enforced labor stoppage through ill-advised strikes and lockouts and by the absence of conciliatory machinery is perhaps greater than the loss caused by limited skill. Production has unfortunately been regarded as a private enterprise. We have still to learn that labor, capital, and society are the three constituent agents that must cooperate to insure economic production.

Perfect economic production may not insure increased well-being. The total product must be distributed without waste and with justice. In spite of unprecedented production, we find no small portion of the laboring and professional classes earning incomes below the minimum required for the maintenance of decent standards of living. In old society, each worker controlled the raw materials, the labor and skill of his craft, and the capital in the form of tools and machinery. Labor felt that its residual profit bore a just relation to its effort and investment. But, conditions to-day are very different. Labor has neither raw materials nor capital. If immigration were unrestricted, the labor market would probably become surfeited and the share to each worker would be determined by bitter competition. Hence labor clamors for almost complete restriction of immigration and through its unions seeks to control the number of workers who may enter its field.

We see, once more, the need of teaching that production is a social process, and although to-day in private hands, it must be undertaken for the social weal; that the state

may step in to insure justice to any agent in the process of production; that it is as wrong for society to permit the exploitation of labor through merciless competition as it is to permit any group to retain absolute control of any essential service or product.

We are no less wasteful in our consumption than in our production. Human consumption motivates the whole process of production and determines its results both in quantity and kind. The tendency is to stimulate consumption by fair means and foul. Breaking down sales resistance increases sales but ultimately does little good to society. Extravagance runs riot because we fail to distinguish essentials from luxuries. We may form some idea of the colossal waste in consumption by analyzing Stuart Chase's estimate in terms of the labor of individuals.

WASTES IN CONSUMPTION ⁵

<i>Items of Waste</i>	<i>Estimated Man Power</i>	
	Total	Wasted
1. The military establishment—at least	1,500,000	1,000,000
2. The opium and cocaine traffic.....	unknown	.....
3. The patent medicine traffic.....	400,000	200,000
4. Distilled spirits.....	unknown	.....
5. Crime—criminals	320,000	.....
6. Watchers of criminals.....	400,000	200,000
7. Adulteration	unknown	.....
8. Speculation and gambling.....	unknown	.....
9. Quackery	unknown	.....
10. Super-luxuries and fashions .....	.....	6,000,000
11. Commercialized recreation.....	unknown	.....
12. The overhead services.....	unknown	.....
13. Advertising	600,000	250,000
Total minimum wasted....	.....	7,650,000

It is the hope, perhaps a vain one, that those who are trained in production will oppose waste, for in the last analysis all waste reveals reckless disregard of human energy.

⁵ Chase, *op. cit.*

6. *The Character of Modern Agriculture.*—It is estimated that about one-third of the people live on their earnings obtained, directly or indirectly, from the soil. The prevailing opinion, that agricultural activities are not as economically efficient as the mechanical industries, results in congested city industries. Because hordes leave the farms, rural resources remain undeveloped. In the last analysis we are sprung from the soil and live on its produce; the farmer is our keeper and the more competently he fulfills this trust, the happier is his lot as well as that of society.

Schools of agriculture lift the farmer from the ranks of the unskilled to those of skilled and technical workers. Science and mechanical inventions have concerned themselves with activities of the soil as well as those of the factory. The farmer must know something of the nature and composition of soils; the chemical and physical needs of each of the important crops; the care of seeds and their special treatment at the time of planting; the scientific principles governing rotation of crops; the various mechanical aids now available, how to operate them and how to keep them in proper repair; parasites that destroy crops and how to exterminate them without injury to the plants; care and treatment of cattle and the principles of scientific dairying; and, not of least importance, the business of farm management and proper marketing of the produce. Billions of dollars are lost to farmers through spoilage of fruit, vegetables, cattle feeds, and other products of the soil. New insecticides, new fungicides, more effective preserving agents, and more reliable dehydration systems will reclaim a large part of this loss. New uses must be found for surplus crops. No small fortune is saved, for example, by utilizing unmarketable lemons of very inferior quality, in the manufacture of marmalades, cattle feed, citric acid, and lemon oil.

Farming, in its best form, is a technical occupation, yet far less than ten per cent of our farmers ever received any schooling in their work. Governmental bulletins and agricultural experimental stations offer invaluable aid to the man who seeks from the soil its maximum yield, yet few take advantage

of their opportunities. The reason is not difficult to discern: too few have been taught that science has a practical message for the farmer.

Agricultural education has made advances in all civilized countries. France and Belgium maintain experimental agricultural centers and schools in each province. Switzerland has been called "the country that is synonymous with agricultural education." Students of agriculture have said that while an American remains poor on a five-acre farm, a German makes himself independent on a farm of this size by his superior use of his resources. The Prussian agricultural schools have long earned the praise of competent visitors. Canada prescribes regular courses in agriculture in its rural schools and sets up experimental farms in various parts of the Dominion. England is a very recent convert to education for rural pursuits.

In our own country we can show excellent results of agricultural education given in specialized schools or divisions of western colleges and universities. Scientific farming, cattle raising, agricultural chemistry, scientific dairy methods are studied in special agricultural schools. Research is often supported on a fairly generous scale. The farms are producing more, the people are more prosperous, actual living conditions are easier and more comfortable, the income from cattle-raising is much higher, and the temptation to go to the city and intensify the strife and competition is lessened considerably. Country dwellers who till the soil by the old back-breaking methods, often look upon themselves as part of the soil. They go to roost intellectually. The new means of communication—the improved mail, the telephone, and the radio—are arousing them to the possibilities of the calling and are bringing to them lessons in improved methods of working and living. Agricultural education will not lead its pupils away from the farm but will bring them, rather, to a greater realization of the promise which the soil holds for those who work it intelligently. Here is another illustration of the service that science must render society, for aside from its use, knowledge has little reason to justify itself.

Economic Gains from Vocational Education.—1. *Increased National Economic Efficiency.*—In various ways our study has shown that vocational education, by reclaiming the human skills that have been neglected, eliminates an important source of economic waste. The old days, when perseverance, honesty, and industry were the sole ingredients of the compound known as business success, are gone. To-day, these traits alone would render their possessor virtuous but not necessarily commercially successful. Much special and technical knowledge and manual skill must be added to desirable qualities of character. In previous days, United States governmental reports showed that in certain fundamental industries, the German trained worker added \$3.50 of value to every dollar's worth of raw material, whereas the American worker added only \$1.50; that the German farmer by proper cultivation produced, per acre, 28 bushels of wheat, 50 of oats, 35 of barley, 25 of rye, and 200 of potatoes, whereas the American farmer could get no more, per acre, than 14 bushels of wheat, 29 of oats, 25 of barley, 16 of rye, and 92 of potatoes. The report on *Elimination of Waste in Industry* by the committee representing the Federated American Engineering Societies, already referred to, leads to the conclusion that there is a wide margin between actual and possible economic well-being. Without trained workers, we cannot maintain successfully our position in international competition for, "No tariff, however high, can protect us against products superior in quality and cheaper in price."

2. *Higher Wage Rate.*—The greater the skill of the worker, the greater his productivity and the larger his share of the product. We take no sides in the question whether labor, at present or under increased productivity, receives a full measure of its share of the net produce. We simply posit the simple fact that his compensation, his capacity to purchase the necessary goods and services, will be increased as he produces more. Statistical studies made by Person show that, in the first two years, untrained boys in factories earn more than those in training but that in the course of a few years, the latter earn about 300 per cent more than the former

and, in addition, have every reasonable expectation of occupying supervisory and managerial positions. Similar studies made by the Massachusetts Commission on Industrial and Technical Education and other responsible public bodies give added statistical proof that those who are skilled earn two and three times the amount of the unskilled in the same industry. What is true in industry is just as true in commerce and agriculture.

Increased wages cannot, of course, be set down to the sole credit of training. Native intelligence of the worker is a significant factor; in all vocations, the skilled are, as a group, more intelligent than the unskilled. But vocational training is frequently a matter of chance. In a short-sighted community without facilities for technical education, even the intelligent are doomed to enter industry at its low levels of skill. A well-rounded program of trade training enables the mediocre, as well as the superior, to take a place commensurate with ability.

3. *Relief Is Afforded to Overcrowded Clerical Fields.*—A weekly salary of thirty dollars will hire a competent and experienced bookkeeper or stenographer but not an equally capable carpenter or dressmaker. One reason is that there are enough of the former and not enough of the latter. In most urban communities, we find an oversupply of clerical workers. Manual occupations that enjoy increased wage rates and the dignity that comes from training may attract intelligent labor from overcrowded clerical fields and thus secure for the white collars and the uncalloused hands salary scales in closer keeping with those paid the skilled men and women in the crafts.

4. *Higher Standards of Living.*—Low standards of living can be traced to ignorance, to traditional modes of life, and to low wages. Innumerable public and private social betterment agencies are combating the first two but their efforts are often rendered futile by the financial inability of labor to maintain many of the standards taught. Higher wages, based on greater production of the worker, is an important factor in raising standards of living. In so far as vocational training leads

to greater earnings, it contributes to healthier and fuller living. More than that—the trained worker is an educated worker who realizes that his future rests in his own hands. He feels a dignity in his craft and the bigness of his independent manhood. The educated worker demands better homes, better schools, better recreational facilities, and better safeguards of life and health. He thus lays the foundation of enduring social reform because the demand for that reform comes from within, not from without the community itself.

The Scope of a Progressive Program of Vocational Training.—*Industrial and Vocational Education Differentiated.*—Before proceeding with our discussion, it is necessary to observe that industrial and vocational education are not identical forms of training. *Industrial training* is limited to preparation for the mechanical occupations. *Vocational training* is the general term and includes preparation for every gainful occupation that serves society as well as the individual. Since only a limited portion of the population is industrial, education must be vocationalized, not industrialized.

Types of Vocational Training.—Vocations are commonly classed under one or more of five divisions:

1. Professional pursuits
2. Commercial pursuits—trained salesmen, advertising agents, buyers, managers, accountants, bookkeepers, stenographers, and typists
3. Agricultural pursuits—general farming, specialized farming such as fruit growing, cattle raising, and kindred activities
4. Industrial pursuits—mechanical occupations
5. Household arts—sewing, cooking, nursing, and the like

This classification does not proceed on an occupational basis. It systematizes in the least helpful way, for each group is too generic to indicate the nature of the work and therefore the type of vocational preparation it requires. A more useful and truer classification is the following:

1. Unskilled labor: (a) clerical; (b) manual but without machinery; (c) machine tending
2. Skilled labor: (a) clerical, like the bookkeeper or the stenogra-

pher; (b) manual, like the cabinet-maker or the bricklayer; (c) machine worker, like the linotyper or engineer

3. Technical occupations

4. Buyers and sellers—salesmen, advertising agents, and buyers

5. Managerial occupations

6. Professional pursuits

Principles of Selection.—The United States Census lists thousands of activities that are the gainful occupations of our citizens. How can a school system, however generously financed, hope to train for all of these? The answer is obviously that it cannot and should make no attempt to perform the impossible. Education that trains for vocational life is highly selective and proceeds on one or more of the following principles:

(a) A community should train its young workers for the trades that hold a commanding position in its locality. The controlling industries in City A are locomotive making, repairing, and garment making; in City B, printing and the manufacture of furniture. After a careful survey by competent investigators, the various skilled trades open to beginners in a given locality are listed in order of their difficulty so that the community may decide on the program of vocational education it will undertake.

(b) The generic trades and those that give fundamental skills should hold a preferential place in the vocational training that is provided. The building trades and the needle trades are illustrations of generic trades that develop skill in using their respective tools. Giving very specific trade training which develops trade technique that does not permit the worker to shift, with little trouble, to related trades is a costly and often an unwise business. The large corporations that employ many electrical engineers are urging the engineering schools not to give specialized training in such technical phases as motor designing. The standards of the school may not be the standards of industry. The technical schools are therefore advised by those who employ their graduates to give thorough foundational courses and leave to industrial organizations the training in highly specialized branches.

The basic principle is sound and should control in trade education that is supported by local communities.

(c) Those trades only for which normal intelligence suffices may be included in the school program. Such callings as require exceptional and highly specialized gifts are relatively few. Public education should further those trades which require types and degrees of ability that are common among the citizens. Only after adequate provision has been made for these trades need a community concern itself with professional preparation.

The Objectives of a Program of Vocational Education.—Vocational education has much to contribute to the economic progress of our nation. Its main objectives that have concerned us throughout this section may be summed up as follows:

1. To insure greater human happiness by developing latent abilities so that each individual earns his bread by doing what nature meant him to do rather than what circumstances forced him to do.

2. To quicken industrial, agricultural, and commercial life through the agency of skilled and understanding workers.

3. To eliminate waste in production and consumption and to conserve natural resources, through temperate use.

4. To infuse into our whole economic organization the spirit of service rather than of exploitation for profit.

Progress in Vocational Education.—The Federal Board of Vocational Education makes a strong plea to the schools of the nation that they help maintain our economic supremacy. It says: ⁶

“The Congressional Commission of 1914 had found a condition of vocational unpreparedness for maintaining our agricultural, industrial, and commercial prosperity. . . . If we were to compete . . . in the world’s markets and even in our own market, which is open to the products of foreign labor, our labor must be made vocationally as efficient and skilled as the labor of other nations.”

⁶ “Fifth Annual Report,” Federal Board of Vocational Education, Bulletin No. 28, U. S. Bureau of Education, Washington, D. C. (1923), pp. 18-19.

The World War interrupted in most of the warring nations an unprecedented development in vocational education. Germany held the well-merited position of leader in vocational education. Various peoples studied her trade schools and, too often, played the sedulous ape. Such system of vocational education as Germany evolved was the result of intelligent preview of future needs. Prewar Germany was about the size of Texas. Her resources of iron, coal and copper were decidedly limited; her fields, though fertile, had been cultivated intensively for many centuries; her transportational system, although competently managed, was not extensive; her home markets having similar climatic conditions because of the limited area of her territory, demanded no great variety of products. In contrast, the United States presents an overwhelming picture. Our resources are almost beyond estimation: an enviable supply of coal, iron, copper, and oil; our vast fields under cultivation have an acreage many times the area of all prewar Germany; much of our soil is only a few years removed from virgin fertility; our network of railroads, rivers, and canals exceeds the total mileage of transportational facilities of all of Europe; our markets are not only numerous but varied; they differ markedly in climate, and, in addition, cater to almost two and a half times as many people as prewar Germany. Verily, the pigmy and the giant.

Yet German-trained chemists became leaders in the manufacture of dyes and in the mixture of steel; German textile workers successfully rivaled the time-honored English weavers; German mechanics were invited everywhere and were encouraged to come to the United States to hold responsible supervisory positions in American foundries. Germany trained her commercial workers so effectively that they gave her a place in every important market of the world. The United States reported officially,⁷ "It would be difficult to estimate how many young Germans are managing the correspondence in our large houses."

⁷ "Report of the Commissioner," U. S. Bureau of Education (1903), p. 654.

During the St. Louis Exposition, a German commission was busily engaged studying the industrial status of the United States in order to determine our full economic strength. The commission reported that while America is progressive and enjoys untold bounties of nature, Germany need not fear us as a permanent effective competitor "because of a complacent feeling with everything American." The United States did little to develop the skill of her workers or to conserve her wealth but relied rather on her vast resources to keep her on the front line of the nations.

In the first three years of the World War, Germany resisted successfully the combined powers of almost all of civilized Europe. She seemed like the immovable wall of the old puzzle. Students who searched for the secret of her strength concluded that it lay in the superior vocational preparation of her citizenry. In the last analysis the most valuable asset of a nation is not its raw materials hidden in the soil but undeveloped human skill and intelligence dormant in its citizens. Germany could not increase her tillable lands, nor the mining areas, nor her boundaries. She set herself to developing the most skilled workers in every branch of industry and commerce so that each citizen would become "most useful and usable." Her trade schools became her first line of economic defense. It stood up well in the stress of a long and devastating war.

England awoke to the need of educating her workers in the hope of assuring her threatened industrial prestige. Civic Universities were established in the cities of Birmingham, Manchester, Liverpool, Sheffield, and Leeds. These large technical schools aimed to teach the application of science to industry. Leeds, the textile center of England, has its Civic University, with a School of Textile Industries and a School of Dyeing and Coloring Chemistry. Only after Germany succeeded in wresting from England the supremacy in the dyeing of fabrics were these two schools organized. Sheffield, the cutlery center of the Empire, has a School of Metallurgy in its Civic University. Each of these cities tries to give the best possible technical training in its specialty in order

to withstand the telling competition of the efficiently trained foreign worker.

Other nations entered upon programs of vocational education with vigor and intelligence. France inaugurated a system of trade schools to supplement apprenticeships. Switzerland extended her educational supervision of youth up to the age of nineteen through a system of technical education in each canton. The Swiss list of occupations for which training is given is liberal and includes even hotel management. In many instances, no workers enjoy the full rights of industrial and political citizenship who have not passed their final trade examinations, usually given at the age of about nineteen. The United States has been called the "caldron where the American trade school is brewing."

The Opposition to Vocational Education.—1. *Is Vocationalized Education Undemocratic?*—Opposition to public vocational education is often based on the conviction that training for a definite vocation is out of keeping with the basic principles of democracy. Vocational training, it is said, is training for membership in a definite class, the workers' class; education in a democracy should never set off those who are academically bound from those who are less fortunate and are destined for life in industry or commerce.

There is no escape from the fact that society is a highly stratified structure. Individuals should ultimately attain lower or higher strata depending solely upon their native abilities and their personality traits. Some are destined for low levels primarily because of physical disabilities and limited capacity for the acquisition of skills demanded by society; others, favored by nature, are bound for higher planes of life. The democratic ideals of a society are essentially political and do not save it from an inevitable economic stratification. Differentiation in the real abilities of individuals demands differentiation in training. Are we serving the needs of our citizens by insisting that in a democracy all be given the *same* opportunity, regardless of the promise they reveal for growth in socially useful skills? Are we serving democracy by casting the least and the most gifted in the same mold?

Democracy owes to each, not the same, but *relatively equal* opportunity for education so that he may attain that destiny which is altogether in harmony with his gifts. Education is truly democratic when it helps each individual to the fullest realization of his real abilities.

2. *Will Vocational Education Train a Permanent Working Class?*—A second reason for opposing vocational education is the danger of training a permanent working class. True, it is proposed to train for appropriate gainful occupation those who cannot maintain themselves in an education that is generally academic. But why assume that education is condemning them to permanent membership in the ranks of the employed? Workers of alert and aggressive minds do not stay put; they strive to attain supervisory positions or to direct their own establishments. Why assume that intelligent men and women will cease every effort to rise above their introductory ranks in industry or commerce merely because they are vocationally trained? No amount of circumlocution can blind us to the fact that in a democracy there are classes, working classes, managerial classes, employing classes, professional classes—economic classes of all sorts. The sooner the school recognizes that most of its boys and girls are destined to lead lives that are manual and commercial, the sooner will its education make them happier and more useful men and women.

3. *Will the Ranks of Skilled Labor Become Congested?*—What the ultimate result of a long period of vocational education will be, no one can predict with certainty. In the years preceding the labor maladjustments created by the World War, the problem of unemployment was the disposition of the unskilled and those without vocations. Labor agencies know that our acutest shortage is in the ranks of the skilled, not in the unskilled.

We must bear in mind that among one hundred unselected individuals bound for the trades we find a wide range of intelligence and mechanical aptitude. Some are perhaps fit for the most skilled work, some for the moderately skilled trades, and not a few can perform only simple routine labor. Let

us assume five grades of skilled work; the number that would probably be suited for each grade of service is given below:

<i>Approximate Number Out of 100 Unselected Workers</i>	<i>Type of Work for Which They Can Qualify</i>
Group A	10 Grade A—The very skilled occupations
Group B	20 Grade B—The skilled occupations
Group C	40 Grade C—The moderately skilled occupations
Group D	20 Grade D—The occupations that border on the unskilled
Group E	10 Grade E—The least skilled, or wholly unskilled, occupations

It is apparent that no system of vocational education would attempt to train Groups D and E for skilled work and Group C for anything that requires more than moderate skill. Nature always provides those who will tend the machines, those who will hew wood and draw water. But any school system that neglects to develop the skill that lies dormant in those of Groups A and B and allows them to draw water, is indeed, impoverishing the community that supports it. The vital problem is to distinguish those born to hew wood from those destined to care for monster engines or to assemble the delicate parts of important laboratory instruments. But more of that in our discussion of vocational guidance.

4. *Trade Education Must Be a Trade Obligation.*—Why not leave trade training in the hands of those who control industry? Factory owners purchase new machinery and improved equipment as the trades progress to higher stages of efficiency. If skilled labor is needed for the efficient conduct of industry, then industry should provide the training. Why tax the community to relieve those who reap the profits of industry? This argument is capped by pointing to corporation owned schools that give effective trade education.

There are many reasons for rejecting this plea that vocational training be left to the initiative of capital. While

specific industries may be directly helped by an adequate supply of skilled labor, society is, in the long run, the real benefactor. If industry finds it necessary to invest large sums in educational enterprises, it will add the cost of this trade training, as it should, to the final product. Society, the consumer, pays in the end. Why not, therefore, attack the problem directly and regard vocational training as a charge against social income? The community that pays the cost of vocational preparation should maintain direct supervision of this form of education as well as of the others.

There is an implied analogy in the argument that industry will pay for trade training as well as for equipment if it finds the former as necessary as the latter. But the analogy does not stand on all fours. The fundamental difference is the obvious difference between dead machines and living workers. A large foundry, internationally known, turns out excellent machinery. To insure itself a supply of well trained mechanics, it maintains its own trade school. Each year, two or three hundred boys apply for admission to this school. The competent principal chooses well. He selects the most promising fifty or sixty for his tentative student body. The others, he dismisses unceremoniously with no concern for their future. Where shall they go? How can the best of those rejected be prepared for suitable occupation? These are no worries of his. What if he find among the sixty he selected, ten or twelve who are fit to be trained for trades more skillful and more remunerative than any his foundry can offer? Does he dismiss these exceptionally capable boys and advise them to seek the training that should be theirs? Does he not ease his conscience by rationalizing—"True, these ten are fit for better than we can offer; but this is good training and excellent preparation for the work they will ultimately do; if these young people are as capable as I think they are, they will rise above the limitations of their environments; if they do not, then I over-evaluated them." Of course, this is either sophistry or a defensive mechanism at work. But the principal is honest. He serves his master as faithfully as we do ours. Hence, it is best to make society the master of every

teacher and every school supervisor. For innumerable generations elementary education was maintained by private philanthropy or by the bounty of the church. Throughout all the centuries of private control of elementary and secondary schools, education failed to make the strides it has achieved during this short span in which it was publicly supported and supervised. It seems reasonable to conclude that in education, socialism has shown itself far superior to private ownership and control.

The query is often raised: Why not include professional education at public cost? Most state universities have answered this question by providing such training for its superior young citizens. The state-supported teacher-training schools give evidence that the public purse has long paid for preparation for at least one profession. Many a capable student gives up the struggle for a medical training because of economic disability. Society loses more than does the individual whose ambition is thus thwarted. Who knows the significance of this loss to medical science? Occasionally one encounters irritating complacency which expresses itself in the smug conviction that real ability will find a way to express itself in its appropriate field and thus rise above a temporary handicap. There is no answer to such blind faith and baseless hope. Each year sees impecunious young physicians quenching, with no little heartache, their zeal for medical research in the effort to build up a remunerative practice. The state is blind indeed that stands by idly and loses the services of those who are eminently qualified to become its future engineers, teachers, and doctors. The community should set high standards for these professions and then either give the requisite training itself or bestow a substantial subsidy upon those who meet every test of ability so that they may go to approved private institutions for their professional education. Those of a later day will never understand why we of this day were so utterly wasteful of our most precious heritage, intelligence and human skills.

5. *Is Not Trade Skill Superfluous in an Age of Machine Production?*—Opposition to the support of vocational edu-

cation by the public purse is often based on the ground that no small part of our production is accomplished by machinery which calls for machine tenders and not for skilled artisans. Why develop craft skill only to see the inventive genius create machines that cast it upon the scrap heap? Modern specialization and subdivision of labor have added the finishing touches in rendering manual skill obsolete. There is truth in the argument but it overstates its case. Much still remains in industry to make necessary the development of trade skills.

Many of the old crafts still require manual skill. Brick-laying, masonry, carpentry, tinsmithing, printing, and painting are only a few of the old crafts that still demand no mean degree of skill. Often new and better tools and mechanically driven tools are devised but the required trade skill is not diminished one whit. New mechanical appliances often make the human hand more productive. But in the last analysis they supplement rather than supplant the skilled hand of man.

The extent of specialization and of division of labor in the country as a whole is often exaggerated because we are accustomed to think of the organization of a large shoe or automobile factory whose outstanding aim is quantity production. Unwittingly, we assume that all factories are very large and produce on an inordinate scale. But the United States Census for 1920 shows that one out of four factories has an annual product of less than \$5,000; one out of two factories, less than \$20,000; two out of three, less than \$100,000. Here is ample evidence that small scale production persists and is carried on in shops employing no army of workers but a staff of five to twenty. Add to these shop workers the veritable host in the building trades and there results a total of twenty million men and women—no small part of the total industrials in the United States.⁸ Despite the tendency to divide and subdivide manufacturing processes, twenty million workers are still in need of their knowl-

⁸ Figures quoted from Prosser and Allen, *Vocational Education in a Democracy* (The Century Co., 1925), pp. 75-77.

edge of their respective trades as a whole and are thoroughly identified with the product of their skill.

The very presence of the machine creates a demand for skilled mechanics who make machine parts that require minute and painstaking adjustments. In many a highly mechanized factory the number of assembly men, bench men, tool makers, designers, die makers, and cutters constitutes a large part of the whole staff.

Modern industry and commerce require a high degree of vocational adjustment that can be acquired most satisfactorily through competent training. All the intelligence that the worker possesses must be developed so that he can, in a minimum of time, drop one technique for another and use a new and improved tool with the same skill that he used the old. Revolutionary changes in industry occur, but they are relatively few; technical changes, on the contrary, are relatively numerous. To adjust one's self with a minimum of friction to changes in industrial technique calls for a high degree of job intelligence.

In many fields we find an increasing demand for the hand-made product. There is an unmistakable aversion for the sameness that is characteristic of the machine-made product. We want clothes, rugs, furniture, hangings, china, glassware, table silver, jewelry, lamp shades, table linen, gift books, and what not, that show the personal touch of a craftsman. The durability of the hand-made article may be no greater than that of the machine product, but the demand is not for utility but for æsthetic quality. The more we popularize education, the more general will good taste become, and the greater will be the demand for the product of the skillful hand-worker.

The Modern Family.—Enough has been said of the new economic order to show that it has gripped every relationship in life. We have yet to prove that the industrial revolution was more economic than social and spiritual. When woman took her place in the ranks of the wage earners, a new status had to be evolved for her.

In the older and orthodox conception of the family, man

was the outside partner, to use an anachronism, and woman, the inside manager. Their paths were distinct and, too often, far apart. New conditions of employment erase such differentiation of function. Forms of labor, reserved in the past exclusively for men, are now open to women. Sex lines are not very clearly marked in matters of employment. Wages and quality of service, rather than sex, determine the admission of women to vocations heretofore preëmpted by men.

The family to-day is a coöperative enterprise designed to make life as rich and purposeful for woman as for man. Family relations would be happier to-day, if there were a general recognition that woman refuses to permit wifehood to consign her to the humdrum of the kitchen.

Woman's housework has been greatly simplified in various ways. Improved methods of preparing and marketing of food make unnecessary much of the old-time bread baking and food preserving. The change from private house to apartment dwelling reduces very materially the chores that usually fall to woman's lot. Mechanical appliances like steam heat, gas cooking, electric lighting, vacuum cleaning—take some of the back-breaking drudgery out of housecleaning. The general increase in the number of years of compulsory school attendance, together with the decrease in the size of the family, contribute further to the liberation of the housekeeper of to-day.

The Protest of the Intelligent Woman.—But we cannot circumvent nature's design to make woman carry the burden of continuing the race. There comes a time in the life of every trained married woman when she must choose either to give up, for a number of years, the career she has carefully planned in order that she may care for her family or to forego maternity so that she may be free to pursue her vocation. Under present modes of living, a woman of limited means cannot achieve both motherhood and a career with satisfaction to herself and justice to those whom she has brought into life.

The intelligent woman has no enviable lot. She cannot carry out the humdrum and exacting duties of homemaker

without giving up most of her intellectual pursuits. Certain foods may be bought to-day from baker and food preserver but there is a new tyrant, dietetics, that demands special balancing of foods, special modes of preparation, and differentiation for young and middle age. Child care is an arduous task that is almost professional in its exactions. Child hygiene insists that most disciplinary problems and acute emotional disturbances are due either to laxness in parental care or to improper modes of discipline. The intelligent parent is beset by nerve-wearing doubt in the physical and spiritual nurture of offspring. Homemaking has taken the place of housekeeping, but homemaking is a skillful occupation that requires specialized training that is rarely given the prospective wife and mother. And the cost of homemaking is usually in excess of most middle class incomes; the homemaker must, willy-nilly, assume many of the menial burdens of housekeeper.

The unintelligent and untaught young woman usually has a less trying adjustment to make if she becomes wife and mother. Her low-grade intelligence kept her, before her marriage, in an occupation of little skill and less ultimate promise. Marriage to her is an escape, a pleasant and thrilling escape from humdrum. She accepts the rôle of housekeeper and her lack of imagination keeps her content.

The intelligent young woman of education, in a skilled occupation or in the professions is, at least, as much interested in her work as her future husband is in his. Immediately after marriage, she is expected to give up what she has so laboriously acquired, and assume a new rôle. The biologic imperative operates; with the passing months she is mother as well as wife. Housekeeping and homebuilding, the routine of the baby's care and the kitchen, the balancing of petty expenses and limited income—these take all of each day and every day of every week. Month in and month out the same relentless routine leaves neither time nor inclination for intellectual and spiritual life. What a tragedy frequently awaits this woman after two or three children have been nurtured through adolescence. Her work is, in the main, done. She

now has time and some measure of financial assurance that come with middle age. What shall she do? Go back to her trade or profession after an absence of twenty years? She finds herself a stranger in a land she once knew well. What shall be done for her? She has served her family and society well. The traditional romance spun about woman and the family have helped to keep her satisfied within the walls of the home. But modern life is disturbing the mid-Victorian complacency and is opening up a new vision to the woman of intelligence and culture.

The Vocational Education of Woman.—Education must assume that every woman will pass through three successive stages: the breadwinning stage before marriage, the stage of homemaking and housekeeping, and “the autumn of life.” Definite educational provisions can be made for the first two but no one has yet evolved a happy solution for the third stage in the life of the intelligent woman.

Education for the breadwinning stage of man and woman should be shaped by the same principles. Both should receive a vocational training commensurate with their general intelligence and special aptitudes and interests. Sex is a biologic not an economic fact. Woman usually lacks man’s physical stamina, sheer strength, and endurance. Nothing revealed in psychologic research justifies the higher pedestal man occupies in a distinctly man-made world. Only those occupations that require marked native physical strength should be closed to woman.

Preparation for homemaking should be included in the general education planned for women. In addition, adequate intensive training in all phases of housekeeping and home-making should be offered by every public institution planned for adults. This specialized education can best be taken in the months preceding marriage and childbirth for the realization of impending need arouses intense motivation that insures maximum benefit to these young women.

The Nursery School.—It is possible that as the married woman who has attained position in her chosen work makes her adjustments, she will give impetus to the development

of a type of school known in England but relatively new in America. Under the Fisher Act (1916) the infant or nursery school for children of two to five years old was made part of the national educational system in England, not to help mothers solve their problems of career but rather to insure these tots a regimen of living that would inculcate the proper habits of health and emotional reaction in this most important habit-forming period in life. To-day the state supervises education from the sixth to the eighteenth year. Numerous publicly and privately maintained agencies concern themselves with conservation of life in the first biennium. But public education leaves the next four years, except for orphaned and deserted children, entirely without supervision. Much that has been learned in recent years of children of preschool age gives this period, of two to five or six, increasing importance. Attitudes of mind and habits of emotional and physical action—fear, likes, dislikes, antagonisms and attractions—these experiences of preschool age sink deep into the nervous system and determine, in no small way, the behavior mechanism for the entire life of an individual. Universities and colleges, among which are included Yale, Columbia, Smith, and Iowa, and research centers like the Bureau of Educational Experiments in New York City, are developing nursery schools as experimental centers, or “preschool laboratories” that are fraught with significance socially as well as psychologically.

SUGGESTED READING

See end of Chapter XIV, Page 317.

QUESTIONS FOR DISCUSSION

1. “What the best and wisest parent wants for his own child, that must the community want for all its children.” Do you think this is a practical standard to apply to public education? Give reasons. What may be said by those who oppose the position you take? Answer them.

2. “Child labor is only a means of bonding the future to redeem the past.” Why?

3. In what sense were the first colleges (Harvard, 1636) vocational?

4. "If the child can produce, through the agency of a machine, products which are qualitatively and quantitatively the equal of those produced by an adult, it is an economic waste to employ his father at higher compensation than is paid the youth." Does modern economic theory uphold this view? What fallacies can you point out in this argument?

5. What constitutes dead-end jobs? If all children are vocationally educated, who will do the blind-alley work? Will vocational education, properly interpreted and effectively administered, help those in dead-end jobs?

6. Compare urban and rural education with respect to the following:

- (a) Opportunities for health supervision
- (b) Opportunities for health-building recreational activities
- (c) Facilities for training an undoubted aptitude
- (d) Facilities for discovering an aptitude
- (e) Opportunities for the development of an æsthetic sense

7. Recall at least ten people of your acquaintance who are engaged in highly routinized work. Identify them by the first ten letters of the alphabet. Which, in your judgment, are fit for more intelligent work than has fallen to their lot? What has the community done to educate them for the place they ought to hold? Are there agencies, other than the school, which you would hold responsible? Are these superior people happy in their work? Are the less intelligent of the ten people satisfied with their humdrum labors?

8. Select an industry that holds a preëminent place in your community. What are its various forms of occupation? Which require skill? For which can your local schools give training?

9. "In the United States, where mass production is the aim of industry, vocational training is unnecessary. Willing machine operatives, not skilled hand-workers, are needed." Outline, as for a well rounded discussion, your answer to this contention.

10. Trace the changes in the family and in the life of woman that have had their origin in the Industrial Revolution. What is meant by "we have yet to prove that the Industrial Revolution was more economic than social and spiritual"?

11. Do you agree with the text in its exposition of vocational

education of women? With every phase of the discussion? Give reasons in full.

12. What social and psychological gains may be attributed to nursery schools? On what grounds are nursery schools usually opposed as part of a public school system?

13. What evidence of unprecedented strength did Germany give in the first three years of the World War? Compare the geographic and economic resources of prewar England with those of prewar Germany. In the light of this comparison, what would you have expected Germany's resistance to be in the face of combined power? What were her special elements of strength?

14. Tell what three leading European nations have done to develop vocational education since the end of the World War. Where will you find your data?

15. Would you expect the home to become a more effective social institution with the change of the seat of manufacture from the home to the factory? Give reasons for your position.

16. What trades still maintain an apprenticeship system? What provision is made by labor unions or employers' associations in these trades to give youth a thorough trade preparation?

17. Mere employment in a shop no longer trains the skilled craftsman. Is this true of all trades? Of most trades? Give reasons and examples.

18. Assume that regular and extended employment in a certain trade would, of itself, give the young worker, informally to be sure, a fairly good mastery of the trade. Why is it not wise to leave trade training to this form of shop experience?

19. Give instances of marked changes in the processes of production; take illustrations from agriculture, industry and commerce. What conclusions for education may be drawn from the instances you cite?

20. In governmental affairs, we urge business-like administration; in school circles, business-like methods of supervision and control. The implication is always flattering to business methods of production and distribution. What facts seem to cast doubt on the reputed efficiency of business? Illustrate these by personal experiences.

21. Obtain a few catalogues of agricultural schools and colleges which are part of the outstanding state universities of the United States, for example, Universities of Wisconsin, Michigan, Minnesota, Ohio, Indiana, and Illinois. List the variety of training fo:

rural occupations offered. What gains, economic and social, are likely to follow from such training?

22. List the economic gains that may reasonably be expected to follow the inauguration of a well-balanced program of vocational education. Which are purely economic in nature; which are also social in their consequences?

23. State the objections commonly urged against the inclusion of vocational education in a system of public education. Evaluate each of these objections. With which do you agree? With which do you differ? Do you agree consistently with the position taken in the text? Where do you differ? Justify your position.

24. Explain fully and with suitably devised figures representing probable costs: Vocational education, whether given by the public-school system or by private industry, is, in the last analysis, a charge against social income.

25. Which of the following motives arouse the best efforts of the worker: monetary compensation, desire for ultimate freedom from labor, security in old age, desire for greater leisure in the present, desire for welfare of family? To what extent does each control? What other motives may be added to the above list?

26. "The economic history of Germany teaches that the more generously a country is endowed with natural resources, the less effort does it make to develop a system of vocational training." To what extent is this true in the United States? In England? In Germany?

27. List the new and improved agricultural machinery now available for agricultural pursuits. Has the introduction of this machinery increased or decreased the demand for experienced and trained industrial and agricultural workers? Give reasons and illustrations.

CHAPTER XIII

THE ADMINISTRATION OF VOCATIONAL EDUCATION

The study of vocational education has concerned itself, thus far, with three distinct phases: the psychological, the sociological, and the economic. We pass now to a consideration of those administrative problems that play a major rôle in determining the success of a community program of vocational education.

The School and the Problems of Social Pathology.—Education has become the convenient scapegoat. When large cities are beset by criminals whose daring and success are unparalleled, then the educational system is at once condemned. When hordes of unassimilated foreigners lead us to suspect that the melting pot is more figurative than literal, then the school has failed. When we are shamed by our rate of adult illiteracy, then again, the school has not lived up to its trust. When medical examinations revealed that no small percentage of our young men of military age had physical defects that disqualified them even for non-combatant service, then education was blind to its duty. When radical groups challenge our long established institutions and traditions, then education is indicted on another count. When too many of our people are caught in a stream of ultraconservatism, given to complacent satisfaction with things as they are, then the school turns out an unimaginative populace. The critics are abroad in the land and they know only one cause of social ills. In their smugness they forget that the economic status of the family, that the ideals of parents, that the repressions of the city, and that the inherited impulse of mankind are some of the determining factors in molding a people.

That the school has not done its full duty by its youth is undoubtedly true. Neither has the state, nor the church, nor any of our other social institutions. Perhaps we have been

too niggardly in our support of the school. It is our purpose to show that the influence of the school can be widened and quickened through the inauguration of a progressive system of vocational education.

The School and Social Pathology.—Pathology studies the conditions that explain improper physiological functioning of the body; its concern is with sick people. The social body, like the individual, is heir to its own peculiar ills and aches that gnaw at its vitals and sap its life. We have our problems of social as well as of individual pathology.

Antisocial individuals—the paupers, the delinquents, and the criminals—are produced by many causes, which, for purposes of convenience, we may class under three heads: adverse heredity; serious physical defects; vicious environment and inadequate education. The biologically trained student prefers a twofold classification of causes: those of heredity and those of environment or those of nature and those of nurture. The latter grouping seems more scientific because serious physical defects are inherited or produced by the environment. The relative part which nature and nurture play in the shaping of the behavior of mature individuals is a matter of conjecture. Varying values may be ascribed to each depending upon the individuals studied and the predilections of the speculator. Since the environment is a significant causative factor in social pathology, we turn, naturally, to the school for correction. The incorporation of vocational training in the educational curriculum will do much to strengthen the influence of the school by combating elimination and offsetting, in a measure, undoubted causes of delinquency.

Elimination from the School.—*Extent of Elimination.*—The degree of intelligence that an individual possesses ought to determine the extent of the training that he may profitably receive. The child of thirteen whose mental age is sixteen, obviously ought to continue his formal education; his brother of fifteen whose mental age is thirteen, may well discontinue scholastic studies and prepare himself for an occupation within his mental range. Elimination refers to cessation of formal education by those who have failed either to receive the fullest

development of which they are capable or to complete the requirements of the educational law.

The extent of elimination is difficult to gauge mainly because the standards of measuring it vary with locality and circumstances. The withdrawal of the retarded pupil, who is on the border line between "dull normal" and feeble-minded, is given as much weight in elimination statistics as the withdrawal of the gifted child. Despite the obvious indefiniteness of the term, elimination, such figures as are given us by school authorities are significant. Typical of the findings we may list the following:

(a) Only 10 per cent of the elementary-school population will survive through the twelfth grade.

(b) Only 25 per cent of the pupils who enter the high school stay to complete their course.

(c) It is quite probable that less than one-half of the children of the country complete the first six grades; only one-quarter of them ever enter the high school; less than 8 per cent are graduated from the high school.

(d) Elimination in rural districts is more extensive than in cities. The reason is the obvious one—comparative difficulty of enforcing the compulsory attendance laws in sparsely settled sections.

(e) As many as 30,000 pupils drop out annually from high schools of New York City.¹ This staggering number of pupils must be registered, provided with teachers, supplied with necessary books and paraphernalia and followed up carefully before their discharge is finally consummated. The needless expense, not yet computed, is undoubtedly large. The hounding sense of failure which so many of these 30,000 carry away must be included in the social cost of elimination.²

¹ The regular high schools of New York City during the school year ending June 30, 1927, discharged 46,996 pupils. Of this number, 19,099 were graduated, leaving a total of 27,400 who withdrew before completing the course. The number eliminated from the ninth year of the junior high schools is not included.

² These figures show contradictions because they give the extent of elimination in various communities differing markedly in size and character. Taken as a whole, these figures represent elimination in progressive rather than in backward sections.

In these statistics of elimination are included all those who, for reasons good or bad, failed to complete a course which they began. Assuming that the half of the children who were eliminated by the end of the sixth grade had reached the age of fourteen, then almost half of our first voters seven years hence will consist of people who have had only six years of elementary schooling. To complete the dismal picture, include the many whose school year is limited to less than 120 days, and the hundreds of thousands whose elementary education is given by teachers who have never completed the equivalent of a high-school course or who have never taken systematic professional training. The extent of our educational mortality is thoroughly alarming.

Causes of Elimination.—Many conditions operate to produce elimination. Chief among them, we must consider five:

(a) Retardation. The common observation is that a retarded child is soon eliminated. Retardation may be judged chronologically or mentally. The school expects all six-year-old children to begin the work of the first grade; all twelve-year-old pupils to complete the sixth grade; all fourteen years old, the eighth; all fifteen years old, the ninth or the junior high-school course. A child of thirteen in the sixth grade, is, by this table of expectancy, retarded, and an eleven-year-old child in the sixth grade is accelerated.

A more rational computation of retardation is based on the mental age of the child. A pupil eleven years old chronologically, but thirteen years old mentally, who is in the sixth grade is retarded; his abilities indicate that his normal grade is the seventh. For similar reasons, a thirteen-year-old pupil who is mentally only twelve is not retarded if he is in the sixth grade. Failure to devise a commonly accepted measure of mental age leads most school systems to compute retardation on a basis of chronological age.

For the retarded pupil, the differences between himself and those making normal or accelerated progress, are genuinely distressing. He leaves school just as soon as he possibly can, even though his retardation may be caused by late school

entrance, illness, frequent change of domicile, or one of a dozen other reasons that do not reflect on the ability of the child.

Other important causes of elimination are (b) lack of interest, though not necessarily of ability, in school work; (c) failure to maintain the required standards of scholarship; (d) failure to recognize a vocational end in the education prescribed during the years of compulsory attendance; (e) the pressure of poverty which forces youth to turn to wage earning as soon as society permits.

It has generally been assumed that the overwhelming cause of elimination is grinding poverty. But investigations fail to support this assumption. Retardation and lack of ability cause most elimination. Next in order, come lack of interest in book study, and failure to perceive a vocational end, or, in the language of certain parents, "What is it all for?" Another estimate gives the causes in the following order of importance: leaving because of dissatisfaction with the school, 35 per cent; because of necessity, 30 per cent; because of preference for work, 25 per cent; because of desire for profit, 10 per cent.

*How Can Vocational Education Reduce Elimination?—*Many of those who yearn for freedom from classroom studies take a very different attitude towards vocational training. Here deft hands, not mastery of the printed page, help them to maintain themselves. They hold materials; they wield tools; they are challenged by real problems of real life. School work is now not general and indefinite learning, but pointed and systematic training to develop expertness in the very vocation the youth wishes to enter. He has now as many reasons for staying as he had for leaving: the work interests him; his inability in bookish learning is not so manifest; he sees purpose which motivates his every effort. Not infrequently, he urges upon his impecunious family that a larger income is bound to follow his delayed entrance into the ranks of wage earners. Vocational education does not end elimination; it does produce significant reductions in needless withdrawals from school influence.

Delinquency and Vocation.—Students who seek causes, other than innate wickedness, for delinquency, especially among juveniles, have frequently made studies of the distribution of vocations among those whose behavior has led to their incarceration. The findings are interesting and show a common tendency. Let us note a few of the results, typical of almost all similar inquiries:

Of all the boys between the ages of seventeen and twenty committed to a local prison in New York City, 82 per cent had no definite trade or occupation. Any form of work that gives an individual steady occupation and enrolls him in a fraternity of fellow workers was regarded as a trade or occupation. So liberal were the investigators in their classification that they listed truck driving as a trade because the truckster identified himself vocationally by membership in a labor union. Yet, only 18 per cent of the culprits had a definite occupation and very few indeed had an occupation that required skill that comes from training.³

Of 4,300 convicts in Massachusetts at the time of the inquiry, 2,991 or 68 per cent had no recognized occupation. Of 220 adults sentenced to hard labor in the same year, 147 or 62 per cent had no trade. Eighty-eight per cent of the penitentiary convicts in Pennsylvania in one year belonged to the class of the tradeless.

Investigations of the prison inmates in England reveal similar conditions with respect to trades distribution; 77 per cent of the juvenile offenders and 75 per cent of the adult prisoners were without specific vocations before their apprehension by the police.

Booker T. Washington estimated, that for a particular year, 90 per cent of the Negroes in southern prisons had no knowledge of a trade.

Up to a given year there were 6,641 boys sent to Elmira Reformatory on indeterminate sentences. Of these, 4,369 were paroled after they had acquired a trade by which they could earn a living. Over 83 per cent of the paroled were reported, after the parole period, as leading honest and useful lives.

³ Results of an inquiry by students of the author.

Street walkers and female sex offenders of every type frequently come from the ranks of the unskilled and from those of low mentality. No trade means no obvious mode of earning a livelihood and therefore no factor to deter these unfortunates from selling themselves when they are overwhelmed by the consequences of indiscretion or by craving for what seems a life of ease with handsome compensation.

Vocational training is no patent medicine for all our social ills nor is lack of a calling the sole cause of delinquency. Low levels of intelligence, lack of home training, constitutional weakness, overpowering sense of inferiority, influences of the street—these and many other factors may operate to their fullest capacities in the lives of unfortunate youth. Such facts as are listed above do lead us to the inference that he who has a definite craft, and has given of his time and energy to acquire trade skill, feels the seriousness of life and the dignity of taking his place with the other productive members of society. But the lad who shifts from one form of labor to another, who has nothing to distinguish him vocationally or nothing with which to identify himself with any fixed vocational group, lacks a very important stabilizing force. Membership in a trade, especially a skilled trade, gives one a grip upon life and helps him resist those forces that drag to ruin. If a skilled trade helped to reclaim so many of the paroled from Elmira, then why should not society do as much for her normal youths before they enter her reformatories as she does for their thieving friends and indolent cousins after their commitment?

The Negro, under the guidance of schools like Tuskegee and Hampton, is doing much to popularize the idea that social adjustment may come through vocational training. Of the total number of graduates from Negro technical schools, less than 10 per cent are failures in their trades. Farming among the Negroes is never so remunerative as when the technical school graduate returns to the farm or goes about giving his fellow-men the benefits of his scientific acquirements. What these schools have meant for the social amelioration of the Negro time will show. The Negro is

beginning to realize that in an age of industrialism, social salvation may be attained only through economic progress and independence.

We can prove no inherent cause and effect relationship by the statistics we cited; we have drawn an inference, and nothing more, supported by the logical contention that a significant part of the delinquency that society is combating might have been averted by education that is manual and that develops specialized skill in a craft.

TYPES OF TRADE SCHOOLS

Vocational schools have developed along many patterns to meet the needs of industry or the convenience of the prospective or actual trade workers. Each type of technical school is distinctive in aim and therefore differs from others in organization and curriculum. The increasing number of these schools and their growing demand for public support make necessary an acquaintanceship with them.

The Full-Time Day School.—Trade schools are planned to teach skilled crafts in as short a time as is consistent with the laws of learning and the technical demands of the trade. Elementary-school graduates from fourteen to eighteen years of age are admitted. They attend school for a full working day of eight hours and give exclusive attention to their studies and shop projects. The curricula of full-time day trade schools show at least four main divisions:

1. Training for citizenship: health, civics, history and organization of industry, business ethics
2. Training in trade skill through graded shop activities
3. Learning related technical knowledge: elementary arithmetic, drawing, applied science, trade hygiene and sanitation
4. Preparing for intelligent use of leisure: physical training and recreational activities, library work designed to teach what to read that is of general and technical interest

Day trade schools are not growing very rapidly, mainly because full-time attendance does not permit their pupils to earn while they learn.

The Coöperative Trade School.—The trade school that maintains very intimate relation with the industrial world was popularized in America by Dean Schneider of the University of Cincinnati. The student's program is so planned that a week or two of school studies is followed by work for a period of equal length, in a shop of his trade. The alternation of shop work and school studies permits close correlation between trade experiences and class activities. At all times, whether in shop or school, the trainee is regarded as a pupil.

The shop experiences are carefully directed and supervised by a school coördinator so that there is neither exploitation by the owner nor overambitious undertakings by the young workers. The coördinator is an important liaison officer who studies the pupil carefully, suggests to the school curriculum material as determined by actual shop practices, and safeguards the young learners. Usually two pupils are assigned to the same shop in alternation, so that the factory manager may plan to keep a permanent student place. The Haaren High School of New York City and the E. Hampton School, Massachusetts, coöperating with the American Optical Company, are illustrations of this type of school.

The noncoöperative trade school maintains its own shops and plans a program whereby its pupils alternate, each day, between study in class and work in shops. The proper maintenance of shop equipment that is in keeping with the best trade traditions is very costly. Nor is it a simple matter to establish in the school shop the spirit of the real shop. The relationship between pupils and teacher is very different from that which must exist between workers and their foreman. The Manhattan Trade School for Girls in New York City and the Dunwoody Industrial Institute of Minneapolis are illustrations of the noncoöperative trade schools.

Problems That Arise in Coöperative Trade Teaching.—The coöperative school has no easy task. The most effective system of factory production may not be the best system of trade teaching. The Ford plant, by general agreement, represents the most efficient plan for production. Granting the

economic worth of this factory system, is the plant a suitable place where young people may acquire the knowledge and the experience that will make them competent automobile mechanics? The illustration presents an extreme case but it serves to make our point concrete.

In coöperative training, the shop must provide a variety of trade experiences. The school coördinator insists that the trainees should not be kept at a process that they have already mastered. To rotate these students may cause factory disorganization, for workers may be needed at the very task that these students have already learned.

No little ingenuity is required to correlate class work with shop needs when twenty young workers come, in pairs, from ten different shops where they do very different types of work. In a small city that has a few outstanding large industrial plants, this task can be solved with comparative ease, for a group of operatives go to the same establishment and are given an agreed sequence of tasks. In large cities, with diversified industries, the problem is not so simple. The students come from many shops where they follow different sequences of tasks and, therefore, have a variety of needs of industrial and related knowledge.

In the plan established at Antioch College all candidates for a liberal degree alternate weeks of study with weeks of work in factory or store. The object is not to give vocational training but rather to enrich the experience of the students, to help them in the process of orientation, to relate college study with life, and to encourage young people to think seriously about their life work.

Evening and Seasonal Part-Time Vocational Schools.—

We are familiar with the short unit trade course given in the evening to workers in the trades. A skilled trade is analyzed according to its most important processes of production. Each process is made the subject of study, usually in a course of about sixty hours. Thus, machine shop work may be offered in three units: Course 1, the engine lathe; Course 2, the drill press; Course 3, bench work. Those who work during the day come to the evening school in the hope of preparing for work

more skilled and more promising than that which they are at present performing.

Certain cities that have outstanding industries of a seasonal character establish short unit trade courses in the dull months. In the northern cities where the severe winters invariably cause suspension of building, short unit courses in the building trades are taught during the weeks of enforced unemployment.

Other Uses of the Short Unit Courses.—Some vocational schools use short unit courses as the successive steps in an entire curriculum. Each trade is taught in a number of well-graded, sixty-hour, short unit courses taken in prescribed sequence. The completion of each unit marks a significant step in the progress of mastering the trade as a whole. Late entrants are given the first unit while those who began at the opening of the school semester are working at Unit II or Unit III. Nor is it necessary for an entire group to work together on one unit. Carried still further, each course is broken up into a number of job units. A student proceeds with the successive job units as rapidly as a preceding job unit is approved by the teacher. Here we have the Dalton Plan applied to trade teaching.

Private or Corporation Schools.—The assumption, throughout the discussion of types of trade schools, has been that the community owns and operates its vocational schools. It is obvious that private industry may find itself so much in need of specially trained workers that it is compelled to set up its own schools and to admit those of its own choice. In the preceding chapter we discussed with a measure of fullness the reasons that should prompt a community to recognize its obligations to give vocational education, as keenly as it recognizes its responsibility to provide general or cultural education.

Correspondence Trade Teaching.—Teaching by correspondence is often held in low repute because of the activities of correspondence schools operated solely for profit and without conscience. But there is correspondence teaching that is honest and competent and overcomes with skill the difficulties

inherent in teaching by mail. If all correspondence teaching is destined to fail, then no student who has left school can learn from the printed page. Assume that an adjustment has been made whereby a student is taking a well organized correspondence course for which he has both adequate preparation and a definite need. He begins his work with a real drive. He learns his well-graded lessons, reads his assignments, and then recites, in writing, on the whole of each lesson. His performance is returned to him by a competent reader, who points out his errors, directs restudy of very specific expositions, and makes specialized assignments that insure adequate drill. True, the instructor does not actually see his pupil but neither do many professors lecturing to their classes. In proper correspondence teaching there is real contact of mind and mind. Grant the conditions we assumed, for they can be realized, and teaching by correspondence can be very effective indeed.

Most correspondence courses are vocational. To help students decide what to take, and the school to gauge the extent of a pupil's preparation for a given course, the best correspondence schools have worked out a very skillful questionnaire. One of these schools inaugurated a special department which establishes coöperation between its students and their employers and seeks, thereby, to correlate home study with trade tasks. There is no way of measuring accurately the influence of properly organized and supervised correspondence teaching. With the radio in general use and modes of travel facilitated, correspondence teaching will probably develop supplementary forms of instruction which will add materially to its present worth.

Continuation Schools.—*The Schools Described.*—The continuation school, still in the experimental stage, is one of the most interesting of the recent educational undertakings in America. It is not, primarily, a trade school, but a specialized school for those youths who are already in trades and who are inadequately trained for life in general and for their jobs in particular. Attendance is compulsory for adolescents between the ages of fourteen and seventeen or eighteen who have

not completed a regular high-school course. Pupils must attend four to eight hours a week, that is, one or two half days of the normal working day. They may supplement this schooling by study in evening schools, but they may not, as a rule, substitute evening school for continuation school attendance.

Extent of Development in the United States.—The continuation school is spreading rapidly throughout the United States. In 1923 there were forty-three states that maintained part-time schools of various sorts and twenty-one states that had mandatory or permissive part-time laws. It is generally held that vocational education of our day and of the near future must concern itself, to a great extent, with those who are now in gainful occupations rather than with the younger people still in school. We have shown heartless indifference to the vast number of youths who have been forced into competitive business with limited schooling and inadequate supervision after they met the requirements of the compulsory education laws. As we awaken to our responsibility, the continuation school, or a similar institution, will assume increasing importance.

Conditions Which Lead to the Development of the Continuation School.—Many serious social maladjustments of youth brought about the organization of continuation schools. The extensive elimination from the schools threatens the nation with an ill-equipped citizenry. Something must be done to supplement the meager preparation given to most of those who do not complete the ninth grade of the elementary school.

The labor turnover among untrained adolescents is surprisingly great. They shift from job to job with frequency and without reason. The slightest provocation leads the irresponsible boy or girl of sixteen to take up a new type of work. A record of nine to twelve changes in one year is not unusual. These young workers lose even the little training that comes from continuous experience in one vocation and acquire a set of bad habits that tend to make them undesirables in a business organization.

The seeming increase in delinquency leads school authori-

ties to seek an effective counteracting agent. Delinquency is a juvenile social disease. The peak of the age curve of apprehended criminals is between eighteen and nineteen. The child of fourteen who leaves school for industry finds school supervision removed and home ties naturally weakened by an absence of ten to twelve hours a day. The gap between the loss of the old job and the finding of the new one brings precarious experiences that are not always spiritually steady. The more one studies the dangers of the unsupervised years of young adolescents, the more one must realize the need of a socially controlled institution whose concern it must be to maintain an accurate census of young workers and to retain active and helpful relations with them. In New York, employers must notify the proper school official every time they engage or discharge an employee of continuation school age. The continuation school expects its pupils out of work to report daily until new employment is secured and vouched for by notification from the new employer.

The Curriculum of the Continuation School.—The four or eight hours spent in school are devoted to prescribed and elective work. The former includes health activities, civics, English, and fundamental knowledge; the latter, trade studies as closely related to the pupils' occupations as possible. One must grant that little can be taught to pupils who come one-half day each week for about forty weeks each year. But the primary function of the continuation school is not academic, nor even vocational, but rather social and spiritual. The school hopes to awaken an interest in self, to lead each pupil to take stock of his limitations and to formulate his ambitions. It can then direct him to day and evening public or private agencies that will aid him to prepare himself more fully for the vocation he has deliberately chosen. The youth who has once experienced a self-awakening is rarely lost.

Two types of continuation school are being developed—the general and the central. In the former, pupils from every occupation are cared for; in the latter, only those who come from one general type of occupation. Hence there may be

a central commercial or a central printing trades continuation school. The general school usually has comparatively meager equipment for any one trade, since it provides for so many trades. It is a local school. The central school, although richer in trade equipment, may entail long and tedious travel for it is the only one of its kind in a large area. Opponents of the central school argue that elaborate trade equipment is not necessary, because the continuation school is not a real trade school but a vestibule through which pupils should pass to the real trade or technical schools that give thorough preparation for an occupation. The question is an open one and awaits the lessons of experience for final decision.

The duties of the continuation school transcend, by far, its meager curriculum. We may visualize them more readily by the aid of the following summary:

1. The continuation school must arouse an interest in one's future so that the adolescent will ask: "What am I? What will I become if I continue my present mode of living? What do I want to be? Who will help me realize my ambition?"

2. It must give youth definite guidance to insure health.

3. It must analyze each pupil and reveal to him his weakest personality traits.

4. It must strive to teach its pupils of limited literacy the fundamentals of reading, writing, and number facts.

5. It must help each to secure the most promising kind of employment through its placement bureau.

6. It must start each pupil in his vocational education.

7. It must encourage those of superior intelligence to pursue an academic career by taking advantage of an evening high school and, later, extension work of collegiate grade.

8. It must inculcate a reading habit.

9. It must teach activities for leisure hours.

10. It must strive to inculcate a fundamental attitude towards the problems that inevitably arise in economic and social life.

In a word, the continuation school has three basic functions: guidance, instruction, and placement.

The Problems That Beset the Continuation School.—We have drawn up our specifications for the continuation school

but these can hardly be carried out by all schools because of the number and the seriousness of the problems that face them. Consider the variety of needs of the thousands who are forced into these schools. These pupils come from every kind of home, represent every type of occupation, are beset by all the emotional disturbances of adolescence, are distributed throughout the whole scale of intelligence from moronity to exceptional mentality, and bring academic preparation that varies from the sixth grade to the twelfth. Was ever a school confronted by such a motley crowd with needs more pressing and more immediate? Was a principal ever challenged by a greater set of problems of gradation, classification, and curriculum making?

Where shall the continuation school find an adequate number of teachers of suitable personality and training? The usual grade teacher cannot succeed in the continuation school without serious change in point of view and methods of procedure. Without this reorientation, she proceeds to impose upon the pupils now brought back to school by law, the language drills, the arithmetic, and the rules of conduct that played a large part in hastening their departure from the elementary school.

The continuation school is still in the propaganda stage. Many employers resent the regular enforced absence of their young employees for one-half day each week. Many citizens are not ready to spend public money to educate these young workers while evening schools are open and maintained at a lower cost.

The numbers who are included in the provisions of the continuation school law are so large that they make a serious problem. In 1918 there were 53,000 in continuation schools in the United States; in 1922, there were 222,800. The census of 1920 shows us that about 2,225,000 are of continuation school age. New York City alone, may soon have 100,000 or more to care for in these schools.

The number of pupils, whether that number be large or small, produces its peculiar problem. Large numbers usually produce many administrative cares, but large numbers permit

easier classification and thus help solve one set of difficult problems. In small cities, there may be a total of 1,000 continuation school pupils who come to school on one of the ten half days in each school week. Each continuation school really consists of ten schools for each morning and each afternoon an entirely new student body presents itself. If the total registration is 1,000, the average attendance at one of the ten sessions is less than one hundred. To organize a school with so small a registration and give due attention to differences of ability, differences in preparation, differences in character, and differences in vocational needs are often more difficult than to make proper provision for a clientele five or even seven times one hundred.

Poor housing and inadequate equipment add their share to the burden of the continuation school. The least desirable elementary-school building, is, too often, turned into a continuation school. Yet the continuation school is as much in need of an especially planned and equipped plant as any high school or trade school.

"Will the continuation school succeed?" interested observers ask. Time alone will tell. Its problems, colossal to be sure, are capable of solution. The vital task is to acquaint intelligent citizens with its mission and to secure a well trained and sympathetic body of teachers.

What Should Elementary Education Do for Vocational Education?—In the analysis of education as social adjustment we outlined the organization of the first twelve grades according to the 6—3—3 plan, the common six-year course, the junior high school, and the senior high school or technical school. The reader will recall that the proposed vocational program was not to be introduced at the expense of general or cultural education. Although elementary education must be given free scope and must not take its color from vocational training that follows it, it can, nevertheless, do much to further the later work in vocational preparation without impoverishing itself. The education of the first nine grades should render the following service to vocational training:

1. It should give a thorough grounding in fundamental processes and facts that are required in all walks of life.

2. It should ascertain, as far as possible, the interests and capacities of young children through a differentiated program of studies in the junior high-school grades.

3. It should offer a shortened course so that pupils of mediocre ability who are bent on entering the simpler occupations may have a year of preparatory vocational work before the requirements of the compulsory education law are met.

4. It should give each child, through its literature, music, art, and nature study, an insight into life that is æsthetic and spiritual.

5. It should make each pupil who will not receive the full advantages of education, aware of the seriousness of choosing a vocation.

6. Finally, it should not permit a pupil to leave until it has acquainted him with all the opportunities offered to him by public and private agencies for continued cultural and vocational education.

These are the modest services the technical schools ask elementary education to render. The work of the first nine years is quickened and enriched in direct proportion to their capacity to approximate these expectations.

SOME ADMINISTRATIVE PROBLEMS

Dire prophecies are not infrequently heard with respect to vocational education. We are told that the administrative problems alone will destroy the plan to give vocational preparation. Some of these besetting difficulties must be analyzed.

Adjustment of Labor Supply.—How can vocational schools supply the proper number of workers for each major industry, is asked. Will not the school graduate a surplus of workers in certain industries and leave other occupations undermanned? The machinery for estimating the probable number of employees in an important industry is not difficult to imagine nor impossible to devise. Proper field agents can ascertain the present status of labor supply and after conference with labor

and employer organizations make intelligent prediction concerning the probable labor needs for the succeeding two or three years. The technical schools will then have information on the basis of which they can advise students to begin training for particular trades or related ones.

Selection of Trainees.—How will pupils be admitted to training for specific trades, is another query. What if a parent insists that his request, coming from a sovereign citizen, be honored and his daughter be admitted to a costume-designing course? It is difficult to understand why intelligent critics should foresee such anarchy in our educational system, merely because it is administered by a democracy. We have state universities and city colleges maintained wholly at public expense. Have educational authorities any difficulty in barring unqualified students from their professional schools or from liberal colleges? Students who meet announced standards are admitted to trade schools. The less the need for workers in a given craft, the higher are the requirements for admission to training for it; the greater the labor need, the lower the standards.

Elaborate and Costly Machinery in School Shops Is Prohibitive.—Suppose the processes of industry change and the existing equipment is rendered obsolete almost overnight, will the school scrap its costly machinery and install the new? What if the industries in a region change, will the school continue to train for old occupations or rebuild shops and laboratories? If the school equipment is to be kept up to the standard of the best in industry, small cities of 100,000 will require dozens of trade shops, and the large cities like New York and Chicago, literally hundreds of buildings to house the machinery. How can we expect such a costly system of education to be borne on the shoulders of the taxpayers? These questions, asked again and again by serious students, reflect honest doubt but a doubt that is born of ignorance. It is not the intention of trade education to duplicate the costly machinery of industry, but rather to utilize that equipment through the establishment of coöperative plans of trade education. A comprehensive program of trade training cannot

be carried out without the aid of industry and without the use of the factory itself as a supplementary school. Industry is not slow in realizing that it must either give trade training itself or cooperate with the public school authorities in giving trade preparation. The former is very expensive and carries no small responsibility; the latter entails administrative inconvenience which is offset by the assurance that properly qualified workers, familiar with actual shop conditions, are available as industry needs them.

The Supply of Teachers.—A serious shortage of adequately prepared teachers confronts the trade schools. Skilled craftsmen, who want to become teachers, can be found in sufficient number; skilled teachers, in perhaps smaller number. But skilled artisans who have mastered the teaching technique and can formulate curricula that are pedagogically sound are few. Vocational education cannot rise above the level of its teachers. Here we have a real problem in vocational education that cannot, under the most auspicious circumstances, be solved in a year or two. Encouraged by a liberal subsidy from the federal government, the several states are bending their best energies to filling the ranks of teachers of vocational schools with men and women rich in trade experience, skilled in trade technique, and intelligent enough to profit by carefully planned teacher training.

Unified or Separate Administrative Control.—There is decided difference of opinion concerning the control of vocational education. Some favor its administration by the very officials who are charged with the conduct of nonvocational education. They argue that such a plan avoids class distinctions and affiliations; that vocational training and general education are thus better coordinated; that economy is achieved in the use of buildings and equipment; and, finally, that better control of the entire school population is thus assured.

No small group of experienced administrators favor the control of vocational education by a separate board on which are represented, among others, labor and capital. They contend that school men are already overburdened and cannot carry an added duty that is so important; that vocational

education should be kept vocational and freed from academic domination; that under a separate board, vocational schools are assured better financial support; that vocational education cannot be carried on successfully unless labor and capital cooperate in the enterprise; and that the problems in vocational education are so technical that no school man can solve them without a background of rich trade experience.

The general practice is to maintain single control of all education and to delegate the supervision of vocational education to a special committee and a special director who is no stranger to the peculiar problems of trade education. But dual control is not necessarily ineffective as is evidenced by the development of vocational education in Wisconsin.

FEDERAL SUBSIDIES FOR STATE VOCATIONAL EDUCATION

The Nature of the Subsidy.—The era of development of vocational education in the United States began with substantial subsidies to the several states by the federal government. It was felt that material aid was needed to encourage local effort and to enable the poorer communities to raise educational standards and to establish new educational activities. The federal subsidy was also designed to maintain a helpful cooperation between the central government and the state governments in a matter whose influence transcended local boundaries.

The Federal Board for Vocational Education administers the funds which were made available through legislation in 1917. The federal government now gives the following sums annually to the states: three million dollars to help pay salaries of teachers and supervisors of agricultural studies; three million dollars to help pay salaries of teachers and supervisors of industrial and commercial subjects; one million dollars to help pay for the training of vocational teachers. The fundamental condition governing the grants is that the local government spend as much for the purposes just enumerated as the federal government grants. The first three million is allotted to the states according to their respective rural popu-

lations; the second three million, according to their respective urban populations; the last sum, according to their respective general population. Each state, in its turn, makes grants to cities, towns, or counties on similar conditions, namely, that they spend as much in specified salaries as the subsidies that are granted them.

Results of the Federal Subsidies.—That the plan of the government brought results is revealed by the following brief summary:

1. After 1918 there is a marked annual increase in local expenditures for vocational education. Cities pay out of their own treasuries more than they agreed to spend in order to receive the subsidy.

2. The number of schools receiving grants which originated in federal subsidies increased from approximately 1,700 in 1918 to 5,700 in 1923.

3. The number of teachers federally aided increased from about 5,000 in 1918 to 14,500 in 1923.

4. The number of trainees in federally aided institutions, preparing to teach vocational subjects, increased from 6,500 in 1918 to 18,800 in 1923.

5. All states established permanent systems of vocational education and committed themselves to the policy of state, city, or county institutions. There is also a marked trend towards the establishment of voluntary rather than prescribed standards.

But like all new enterprises of large scale and rapid growth, the whole system shows serious weaknesses: vocational schools are often made the repository of the mentally weak and morally delinquent; ill-advised programs are undertaken; poorly prepared teachers are appointed; workers already in industrial and commercial occupations are frequently neglected and training is given exclusively to those not yet in gainful occupations. These faults may be attributed to the newness of the undertaking and will in all likelihood be corrected by experience.

Opposition to the Subsidy.—Federal aid to state education has aroused strong opposition. The argument that such grants are unconstitutional has been laid low by judicial

opinion. The eternal specter, undue interference by federal authorities in a state function, is revived with new-born zeal. The same objection may be raised to the aid given the land-grant colleges, and to the aid assured by the Morrill Act, the Smith-Lever Act, and similar legislation. The standards set up as the minima by the Federal Board for Vocational Education have usually been exceeded by the state receiving the grants. In such legislation as the Maternity Act and the Good Roads Act, the degree of federal prescription upon the states is far greater than those in the Vocational Education Act of 1917. Each state is at all times free to accept or reject federal aid in developing its program of vocational education.

SUGGESTED READING

See list at end of Chapter XIV, Page 317.

QUESTIONS FOR DISCUSSION

1. List at least four specific causes for each of the following social problems:

- (a) Juvenile delinquency
- (b) Inability of most people to use leisure time intelligently
- (c) High rate of physical defects among young men and women between the ages of seventeen and twenty-one
- (d) Improper sex life

Classify these causes under the headings of (a) heredity and (b) environment. Which causes, those of heredity or those of environment, seem more predominant?

2. Which of the following children are really retarded? Why?

<i>Child</i>	<i>Chronological Age</i>	<i>Mental Age</i>	<i>Grade</i>
1.	10	12	V
2.	9	9	IV
3.	13	10	V
4.	15	13	VI
5.	12	15	VI

3. Recall as many of your classmates who dropped out of school as you can. What was the cause of the elimination of each?

Classify these causes. Does the text mention all the causes in your classification? Point out the differences.

4. What are causes of elimination that reflect on the character or ability of a pupil; that do not reflect on the pupil?

5. Can you recall instances in which elimination would have been thwarted had the school offered opportunity to prepare for a definite calling?

6. From the columns of a newspaper published in a large city, select the names of people charged with the commission of serious crimes as well as of those found guilty after trial and sentenced to prison. What was the occupation of each of these people before they were apprehended by the police? Do you find what the text leads you to expect with regard to trade affiliations of delinquents and criminals?

7. "Trade schools prepare for trades and not for living." Refer to the curricula of full-time trade schools and show to what extent this characterization is true.

8. Plan a month's work for an adolescent in a coöperative trade school. What is the plan of alternation? For what trade or occupation is the young person being trained? List suitable subjects for class study and appropriate job assignments in shop or office.

9. Compare coöperative and non-coöperative trade training with respect to costs, correlation of shop work and school studies, and effective supervision by the school.

10. Which of the following statements are true of correspondence teaching conducted by a qualified staff and supported in whole or in part by the public?

(a) This form of teaching is limited to instruction in theoretical subjects

(b) The teacher never knows the pupil

(c) Teaching one pupil at a time is excessively costly

(d) There can be no check-up of an individual's real knowledge in correspondence study

(e) In correspondence teaching, mind is not stimulated by mind, as in class teaching. Teaching must be a process of group as well as of individual stimulation

11. What social considerations make necessary the continuation school or a similar publicly supported institution?

12. Which of these reasons, if any, justify the discontinuance of continuation schools:

(a) Not much can be taught in one half-day each week.

(b) Children who have completed the requirements of the compulsory education law should not be compelled to continue their schooling. It is as unwise and wasteful to impose education after adolescence as to neglect it during preadolescence.

(c) Employers find that the enforced absence of younger workers for half-day each week creates a management problem. They should not be compelled to permit such lapses in employment.

(d) To maintain proper census of employed adolescents and proper educational supervision imposes a heavy financial burden on the community.

(e) The basic functions of the continuation school should reside in the home or in industry. It is wrong for public education to take over the duties, even in part, of these two institutions.

13. List administrative and pedagogical problems that confront the continuation school. Which are peculiar to the continuation school? Which are common to all schools but are especially difficult of solution in continuation schools?

14. What characteristics of an effective teacher make for especially superior service in continuation schools?

15. "Progressive and sound education in the first nine grades, although free from definite vocational function, gives a rich basis for future vocational training." Explain and illustrate fully.

16. What are the administrative problems that critics of vocational education foresee as the fatal handicaps which doom vocational preparation? Are they real or imaginary problems? How can they be met? Do similar problems face schools other than vocational schools? Cite instances. •

17. What type of person would you select from the crafts for training to teach a trade, say, printing, or costume designing, in a technical or trade school?

18. On what basis does the federal government grant subsidies to the states for vocational education? Do you think this is a just basis for allotting funds? Why? What does the federal government hope to achieve through these subsidies?

19. On what principles do the opponents of federal aid to state educational enterprises base their contention? Formulate your position in this controversy and make reference to similar issues that have arisen in American history.

20. What is the relation between increased opportunities for vocational education and an increase in the compulsory school age?

21. What agencies, other than organized private and public schools, give vocational preparation?

22. Would it be wise to raise the compulsory school-attendance age for all adolescents to sixteen and discontinue the continuation school? Consider the range of mental ability of pupils, their interests and economic needs. Give reasons for your answer.

23. Opponents of the continuation school insist that young workers under eighteen who have not completed a high-school course, be permitted to attend evening schools in lieu of continuation schools. Do you approve this alternative for all young people? Why? For some? Which? Why?

24. List all the schools and courses which your community offers its citizens for trade education. Classify these schools according to the types discussed in the text.

25. If possible, interview persons taking vocational courses by correspondence and inspect their lesson sheets and the comments on their corrected assignments. What is your judgment of this type of trade teaching? Consider among other things: correlation between lessons and daily vocational duties of the students; the use of the students' academic and trade experiences of the past; methods of judging students' work; the corrective measures suggested after each assignment is corrected or criticized; the individualization of the instruction.

CHAPTER XIV

VOCATIONAL GUIDANCE

The Need for Vocational Guidance.—The most significant selections in life are made by most people, apparently, with the least forethought. The choice of occupation is not infrequently a mere matter of chance. No thought is given to the nature of the work, the opportunities for advancement, or the drain it makes on health. The immediate desire, occupation that leads to large earnings, overshadows all vital considerations. Left to themselves, most untrained adolescents will accept almost any form of employment.

A survey was made of the type of work accepted by 10,000 boys and girls between the ages of fourteen and eighteen. The statistics show clearly that those fields that require little skill, that offer little opportunity for growth, and that hold out no promise of ultimate worth-while remuneration attracted most of these adolescents.

The results are precisely what one would expect. Modern industry and commerce are so complex that the young worker knows only those occupations in which the members of his family and his friends happen to be engaged. In these, he seeks employment. A friend or a relative brings news of a vacancy in his place of employment and the youth makes post haste to apply for it before it is filled. No inquiry is made to ascertain the nature and the worth of the work. These are secondary matters. Untaught and untrained workers seek a buyer of their time and their strength, not of their skill.

Small wonder that we find the tragedy of the misfit. The vocationally miscast find too late that chance has betrayed them. They may be too old to change or have assumed too many obligations to risk a change. Caught in the grip

of circumstance, they continue, the proverbial square pegs in round holes, spinning out their lives in activities which afford no outlet for such ability as they may have. No mean price is paid for this realization, since only the intelligent can really take stock of their abilities and evaluate their jobs in terms of the demands made upon them.

Of what avail are all our vocational and technical schools, if the worker is not being trained for the task he was meant to perform? Proper guidance is perhaps more important than proper training because the individual who is put into his proper sphere is bound, sooner or later, to find himself and to express his abilities. The waste engendered in misplacing skill is perhaps no less than the waste in neglecting it.

Meaning of Vocational Guidance.—It must not be assumed that vocational guidance implies the determination of the particular trade which an individual must enter. No such vocational determinism is contemplated; no such positive and specific direction is possible. Vocational guidance is achieved when the following conditions are attained:

1. The aptitudes, that is, the inherent capacities, of an individual are ascertained.
2. The wide range of occupations are shown him.
3. Necessary principles of vocational selection are impressed upon him.
4. Suitable occupations are suggested to him.
5. The opportunities for training for these occupations are clearly pointed out to him.

The process of guidance should begin as early in the child's career as possible, certainly long before youth enters upon his trade training.

Before the school can undertake to give vocational direction, it must make sure that it has acquired two sets of facts, both accurate and extensive: one concerns itself with the child and the other with all the important forms of occupation.

Knowledge Required for Guidance.—The vocational counselor must know all that can be found out about the pupil

whom he is directing. This in itself is no small task. He must possess, in addition, an employment coefficient for each important occupation, calculated in terms of the answers to such questions as the following:

1. What is the present status of the labor supply in this occupation?
2. What is the present status of this occupation with respect to growth?
3. What changes in the productive processes are threatening? Is the industry about to be mechanized? Will the machinery probably reduce labor to the ranks of the unskilled? Will it probably require a new type of skill?
4. What training must one possess for entrance into the trade?
5. What are the opportunities for personal growth in the trade? Is it a blind-alley? Does it lead through a series of occupations, each requiring greater skill and thus opening up successive avenues of promotions?
6. What drain upon health does the industry make? What physical type of worker does it require?
7. Is the occupation educative in itself and is it free from demoralizing effects upon young workers?
8. Does the trade pay a living wage?
9. Are there any legal restrictions upon entering the trade?
10. Must the labor organization in this industry be consulted before admission can be assured?

The vocational counselor is a specialist with accurate employment data and a large outlook on the whole field of industry and commerce acquired through first-hand experience. An efficient teacher of mathematics or an inspiring teacher of English, however well intentioned, is not necessarily qualified to guide adolescents vocationally.

Securing Information of the Pupils' Abilities.—1. *Personality Record.*—It is important that we know the outstanding personality traits of our pupils before giving vocational advice. One occupation requires an abundance of confidence, another, slow, critical examination of every step before proceeding to the next. Painstaking accuracy in dealing with minutiae may be necessary in one vocation and quick reaction

of large muscles in another. Some engineers can do well in outdoor work, others fail there, but succeed in indoor work. The vocational counselor must know the habits and interests of those whom he guides. He must look to carefully recorded observations on pupils' school records for these data.

2. *School Achievement and the Differentiated Course of the Junior High Schools.*—In our discussion of the junior high-school program we stressed the differentiated prevocational work for discovering pupils' aptitudes and vocational interests. It is important that those trade experiences be incorporated in the junior high-school curriculum and that they be presented in school shops and offices that resemble closely the actual working conditions in business. In this way responses are elicited under genuine vocational conditions and pupils can be judged more accurately.

The school record will remain an important factor in forming an estimate of a child's general ability and specific interests and gifts. The school record summarizes, first, a pupil's actual performance during a consecutive number of years; second, the personal judgments of many teachers, often as many as twenty for the first nine grades; third, his reactions to different types of tasks and to different kinds of people. The use of standard achievement tests will give more accurate estimates of a pupil's performance in fundamental school subjects, and reveal his standing in relation to others of like age, grade, or mentality. If we add to this summary, the record of a pupil's achievement in his "try-out" courses of the junior high school, we realize how invaluable is the service of the school record.

3. *The Psychological Tests—The Measure of Intelligence.*—Much reliance is placed by many on psychological tests designed to measure intelligence. It is pointed out that each trade requires a minimum of intelligence, the more skilled the trade, the greater the intelligence necessary for successful craftsmanship. Granting the contention that an intelligence test measures intelligence, we can list all the occupations and indicate for each the minimum intelligence that a prospective worker must have if he is to maintain himself in it. The

implication is that those possessing decidedly more intelligence than a particular vocation requires will, by virtue of their greater intelligence, strive for something higher.¹

But the mere coefficient or index of intelligence is an inadequate predictive agent in matters vocational. Individuals with lower intelligence but with capacity for work, and burning desire to succeed often do better in a given occupation than those of decidedly higher intelligence. Conversely, a young person of high intelligence but of a restless, roving disposition, unable or unwilling to apply himself to the grind of training, fails in those activities in which we may predict success on the basis of mere mental power. Intelligence quotients without a full record of personality traits are not very helpful in guiding pupils.

What if one believes that intelligence may consist of specialized abilities rather than a centralized capacity for adjustment to every variety of experience in life? In that case, the intelligence quotient fails to reveal a pupil's social intelligence or mechanical intelligence.

McCall² believes that there is an "objectively measurable something which constitutes the core of most aptitudes. . . . This something is general intelligence." But belief is here more closely related to conjecture than to actual fact. McCall makes three very helpful observations: First, to guide pupils to highly skilled work, such as laboratory technician or statistician, highly specialized tests are necessary. Second, the lower the skill of a trade, the less significant is the measure of intelligence. People of limited intelligence are likely to perform unskilled work better because they experience less emotional irritation in routinized activity. Third, disabilities are more frequent than special aptitudes, hence special supplementary aptitude tests are necessary.

4. *Performance on the Job.*—The oldest and most reliable test of vocational aptitude is to gauge the quality of the work in the actual performance of trade tasks. But, applied as a

¹ These tests are discussed in greater detail and evaluated more critically in another section. See Ch. xxi.

² W. A. McCall, *How to Measure* (The Macmillan Co., 1922), Ch. viii.

sole test, it has all the limitations of any method of successive trials and errors. It is very costly in time and materials and retards all the processes of our economic organization. Repeated failures may rob an individual of self-confidence and leave him a victim of a sense of inferiority.

This test works well when used in coöperative trade schools. The pupil is observed carefully during shop assignments and the reasons that make his performance highly creditable, or just acceptable, or a flat failure, are carefully noted. These are then analyzed and interesting data for guidance may result. * The factors that make for success may indicate that the trainee should be cast for more advanced occupations. The reasons that explain the failure of a student worker engaged in small-scale mechanical problems of instrument making, may show clearly, not lack of mechanical ability but rather the need of assigning him to large-scale, outdoor mechanical work like erecting derricks and bridging spaces.

5. *Occupational Ability Tests.*—Some vocations have evolved specialized tests appropriate for specific occupations. The method of developing those tests is usually the same for all trades. A job is analyzed in terms of abilities or traits requisite for success. Thus, it is decided by experienced supervisors that a successful salesman must have among other qualities—prepossessing appearance, forceful speech, tact in meeting an unexpected turn in a transaction, knowledge of the article he sells, and personality that inspires confidence. These traits are evaluated to determine their relative importance. The test is then applied by having the superintendent rate his salesman according to the agreed table of values of these traits. Where appropriate, a written and a practical test are actually administered. If the test results and the workers' proved worth show a high degree of agreement, the trade test is considered satisfactory; if the agreement is low, unsatisfactory.

It is often difficult to measure the most important job requirements like personality, honesty, tact, or ability to inspire confidence. These are often nonratable. Not infrequently, a single nonratable trait may be more important than all the

ratable traits put together. Occupational ability tests can be worked out for simple callings—typist, bookkeeper, telephone operator, and the like. Questions on tools, materials, related trade facts and the performance of a few specimen trade tasks will tell the story. These occupational ability tests, or trade tests, are most helpful when applied to those applicants for positions who have already had a measure of trade experience.

Vocational Warning vs. Vocational Guidance.—At the very outset, it was suggested that because of the absence of objective and thoroughly reliable aptitude tests, vocational guidance is more negative than positive. It is more effective in telling adolescents what not to do than what to do. Throughout the whole educational system, there must persist a consistent attempt to help the pupil find himself. By means of appropriate lessons, introduced in geography, civics, ethics, and hygiene, the school must attempt to achieve the following:

1. Children must have an insight into the wide and varied range of occupations. Geography is humanized that stresses occupational activities.

2. The vital importance of selecting a calling must be impressed on all appropriate occasions, so that intelligent selection may supplant the present method of chance.

3. The dangers of blind-alley or blind-end employment must be explained to those of average and superior intelligence.

4. Those occupations that make excessive drains on health must be designated very carefully, so that the least robust will be on their guard in seeking suitable occupation.

5. By every device of the teaching art, teachers should lead pupils to understand why they should shun those occupations that require little skill and make few demands throughout the lives of the workers. Young workers must learn to look for ultimate rather than present income and for opportunities for personal growth.

6. By every art of propaganda, children about to leave school and their parents should be acquainted with the facilities for trade education in their communities.

These functions the school can undertake with confidence because they are in the nature of vocational warnings rather

than positive direction to specific trades. It is necessary to point out that every parent as well as the teacher must exercise the duty of vocational counselor. The assumption of a new obligation by the school does not relieve the home of its responsibility. The problem of vocational guidance is not new. Plato saw it in all its implications and devised his system of successive stages of training and elimination to discover the mission which each member of society was destined to fulfill.

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- "Report on Continuation Schools." By special committee to City Superintendent of Schools of New York City, January, 1924. Especially critical reports by Supt. John E. Wade and Assistant Director George H. Chatfield.
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QUESTIONS FOR DISCUSSION

1. It has been said that vocational selection is determined by force of tradition, that is, children of a given social and economic status tend to follow the occupations of their station. Is this true in the light of your own experience? If true, would this be desirable for the individual, for society, and for industry?

2. Recall ten or twelve of your old schoolmates who dropped out of school as soon as the law permitted. What are their occupations to-day? What were their original occupations? What changes in

employment did they make? What, in general terms, prompted these changes?

3. Explain with illustrations: vocational guidance is more negative than positive; more general than specific.

4. Assume that you are guardian for an adolescent who has chosen tentatively to prepare himself for trade A. He comes to you for confirmation of his choice. What inquiry would you make concerning trade A, before approving the tentative choice?

5. Evaluate each of the following sources of information concerning the abilities of pupils:

- (a) A well kept record of school achievement
- (b) Psychological tests
- (c) General information tests
- (d) Record of performance on the job
- (e) Occupational aptitude tests
- (f) Trade tests

State what aid you may reasonably expect from each and the limitations of each for guidance of high-school pupils.

6. "Vocational guidance must begin in the earliest school years and must be given by parents as well as teachers and vocational counselors."

(a) What can be done in the first six years to help guide pupils intelligently? In the junior high school?

(b) What can parents do to aid in effective guidance? Teachers of academic subjects?

7. To what extent would methods of vocational guidance in a trade school differ from those employed with children of similar age in an academic high school?

8. What was Plato's scheme for vocational selection? Is it in keeping with the general character of Plato's Republic? Illustrate.

9. Select pupil record or report cards used by three or four school systems. What shortcomings do you find in these? Formulate a record card that pupils may take home each month that has the following characteristics:

- (a) Easily understood by parents of limited literacy
- (b) Specific in its information concerning pupil deficiencies and special merits
- (c) Stimulates pupils to greater effort
- (d) Shows relation of a pupil's performance to achievement that may reasonably be expected of him

(e) Does not involve an undue amount of clerical work and test scoring

10. Formulate a cumulative record card that is to be kept in school, showing the pupil performance in the successive semesters that make up his school career. What specific values does the proposed record card possess?

PART V
EDUCATION AS MENTAL
ADJUSTMENT

A. THE UTILIZATION OF INHERITED BEHAVIOR

CHAPTER XV

SELF-ACTIVITY AND MENTAL DEVELOPMENT

Meaning of Mental Development.—Education has been defined as the process that quickens mental development. Obviously, education does not add to the native equipment of the individual. It concerns itself, rather, with so arranging the factors of the environment that the capacities, inherent in the individual, are stirred to express themselves. Teacher and parent afford the child an opportunity to hear good music, to see the beautiful as created by nature or man, in the hope of stimulating the capacities of æsthetic appreciation or artistic expression. Only as the child responds to these appeals does he develop. But the vital fact is that development is from within, not without. Education is, hence, a process of emergence.

Prevailing methods of teaching that stress verbal memorization of printed texts, that rely on lectures with mimeographed or blackboard summaries, and that keep the teacher more active than the pupil, contradict this basic principle of mental development. Teachers of psychology are busy laying low Locke's *Blank Paper Theory of the Mind* but its ghost still stalks abroad. In too many classrooms, the primary aim of instruction is to lead pupils to acquire as much as young minds can grasp. Courses of study still prescribe quantities of highly departmentalized factual material. The teacher is told definitely how much geography or history or biology a class is expected to carry away in a semester, but little is said of the way in which knowledge should be acquired or the character of the development that should result from classroom activity. We are prone to forget that the most skillful teacher cannot impart knowledge; he can never do more than occasion knowledge by arousing and directing the proper

mental activities of the pupils. We ask questions, direct lines of recall, encourage definite trends of imagery, present problems calling for the discovery of new relations—all in the hope of stirring sufficient activity in the minds of our pupils. Knowledge is never a generous gift; it is always a reward for self-activity. The capable supervisor judges classroom performance not by the degree of activity exerted by the teacher but rather by that of the pupils; not by how much they know, but rather by the habits of mind developed in the process of learning.

Spencer and Taine evolved a poetic theory of mental development that presupposes the existence of peculiar psychic units of original mind stuff. Each unit is a most elementary form of idea. As the cells of the body grow with nutrition and use, so do these psychic units grow with each response to the stimulations from the environment. With each act of thinking, the maturing ideas gain in content and in significance. Who can refute with scientific precision this almost whimsical explanation of mental growth? It has won few adherents because it either comes too close to the orthodox religious theory of innate ideas or falls too far from modern psychological thinking.

The conception of Seneca, the ancient, is in closer keeping with the present-day biological explanation of mental growth. "Man's mind is not clay which the educator can at will mold," said he, "but a plant, having its individual nature and form in the seed and capable of being cared for by him as a gardener." A seed may contain a potential tree with its massive trunk, spreading branches, and countless leaves. The gardener cannot change the character of the tree. He assures the seed the most satisfactory physical conditions—soil moisture, warmth, and sunshine—and at once the latent possibilities of its embryo begin to express themselves. The force which makes the seed manifest its destiny comes from within; what it is, we do not know. We resort to a time-honored defense by covering our ignorance with a name. We term it the biologic urge, the cosmic imperative, the will to live—but the truth is, we do not know.

Mental functions of man develop by processes not unlike that which we have just seen. At birth, the entire nervous mechanism seems to have records of only intrauterine experiences. As the externals knock at the sense organs, the gates to consciousness, capacities to remember, to image, to like, to dislike, to understand, to question, to will to do—all these are stirred into activity. The whole nervous system seems impelled to express its myriad patterns of behavior. But what compels it to respond to the appeals of the objective world, we do not know. Again, we face a mystery of life, and again we invent a term; we call it, "The instinctive craving for *self-activity*." Mental functions, hence, grow through their own activity, through their self-expression, through their own reactions to life's experiences.

Application of the Doctrine of Self-Activity.—1. *Self-Activity Defines the Art of Teaching.*—It is evident that one cannot master an experience unless he reacts vigorously to it. Teaching is therefore the art of arousing, sustaining, and directing the self-activity of the pupils. A class learns only as its desire to attain a goal impels it to attend to the teacher's explanation, to recall related knowledge, to image the new experience, to search for added data in books, to attempt to grasp new relations and correct old misconceptions—in a word, only as each pupil undertakes an endless variety of self-expression. In the final analysis learning occurs, not through the presentation of adult experiences by the teacher, but rather through expression of the pupils' instinctive and impulsive attitudes, through their self-activity. Effective teaching proceeds on the theory that real learning occurs as the child gains experience in meeting a variety of purposes. Real teaching guides immature minds to new avenues of life, for all forms of learning are forms of living. Just as no one can live for another, so no one can learn for another. Without abundant self-activity, one does not live, and, therefore, does not learn.

2. *The Stream of Consciousness Must Be Controlled.*—In a simple experience, self-activity flows in many directions. In listening to a lecture there must be auditory adjustment to

what is said and visual adjustment to what is shown. Unless related experiences are recalled, the explanation has no meaning for us. At every turn we must make judgments and come to conclusions in which we accept or reject what is offered. Feelings of pleasure or dissatisfaction are aroused—emotions are, hence, brought into play. We may even desire to become active, to challenge or to uphold the views propounded to us—volitions are thus engaged. Consciousness expresses itself in many forms—memory, imagination, reason, feeling, willing—all flowing freely and commingling within the one moment.

In each lesson, the teacher must decide which form of self-activity is to be made focal and which marginal. An appreciative reading lesson calls for imagination and adequate emotional response. Hence the teacher does most of the talking, reads aloud, exhibits appropriate pictures, stresses the dramatic situations, and then calls upon pupils to dramatize.

What if the lesson happens to be on the Treaty of Versailles? Now thinking must be the focal activity. Hence the teacher does little lecturing and much questioning. Little by little the class acquires the bold outline of facts from the textbook. To test the comprehension of their newly acquired data, the teacher posits the problem: "Many students believe that the next war was begun at the conference table of Versailles; what is the basis for such a statement?" The question may be too difficult but it serves as a motivating factor. The teacher then asks a series of smaller and simpler questions which lead the class to the answer to the original problem. A protracted lecture on the subject by the teacher leads nowhere. Even though the pupils be attentive at the beginning, the stream of consciousness in each one starts its free flow and thinking processes that should remain focal in such a lesson soon become marginal.

3. *Self-Activity Emphasizes the Futility of Impression without Expression.*—An impression that is not expressed in some way is soon effaced. It is the very expression that deepens and enriches the impression. We must do more than merely expose the learner to experiences; he must work them

“over,” and “out” as well as “in.” It is in the expression of an idea, rather than in its impression, that the pupil must utilize the greater amount of self-activity.

A teacher gave an excellent lesson on the Monroe Doctrine. The exposition was clear, the sequence logical and well graded, the approach well motivated—the whole narrative interesting and effective. After the story was told, the teacher dictated a short summary of the main facts which the children wrote in their notebooks. Undoubtedly no pupil could give as succinct and helpful a résumé as could the teacher. But the direct lesson was an attempt at impression; it found the children relatively inactive, with minds, at best, passively receptive. This part of the lesson over, one would naturally expect vigorous and significant reaction by the pupils. They should have been led to formulate the summary, to compare the teacher’s lesson with the material in the books, to select five of the most important facts, to explain the basis of Cleveland’s interference in the Venezuela affair, and to account for our intervention in Haiti or in Cuba. Without these vital applications, the lesson remains, for most pupils, imposing language to be learned, recited, and displaced by other information brought to them from an arbitrary adult world.

The excuse for the practices cited above, is lack of time. The wrong method may give a false impression of economy of time but in the end it involves greater loss, because the basic ideas mean little and are not retained. Most of the black-board summaries one sees so frequently in the teaching of history, geography, civics, and hygiene must be condemned as vicious coaching. They cannot be regarded as teaching practices.

Teaching Values of Maximum Reaction by the Pupils.—

There are many advantages to be gained in requiring maximum expression by the pupils. The expression makes for greater accuracy of the impression. Mere acquisition is always deceptive. As we listen or read, we experience a false sense of acquisition. Not until we begin to express to others our newly acquired knowledge do we realize how much we have overestimated our acquisition: here we misunderstood,

there we overlooked an obvious exception, the conclusion seems unwarranted by the facts—misconceptions and limitations seem to abound. We learn as we teach.

Expression gives retentiveness to the impression. Students may listen without appreciable mental reaction and follow the thought developed by the professor in his lecture. An hour later, they have forgotten most of it. Without reference to notebooks, they are completely lost. The facts acquired in a development lesson based on the study of textbook material are more readily recalled because of the pupils' many reactions to the impressions. Many of us are often surprised at our inability to recall a single one of the good stories that come to us in the course of a week. We grow discouraged about our "poor memory" and envy the ability of the reputed story-teller to recall an appropriate anecdote at almost every turn in the conversation. But we forget that the raconteur knows his bag of stories because he tells them on every possible occasion while others do nothing with them after hearing them. It is the motor expression, James tells us, which will "clinch a fact in consciousness."

The expressions are a test of the pupils' understanding. Impressions are expressed by applying the knowledge that was acquired. Each mode of application is an additional test of the pupils' comprehension.

The more a child does with his knowledge, the greater does his self-reliance grow. To follow the teacher's explanation and arrive at the conclusion. *base times altitude equals the area of a parallelogram*, requires a minimum of ability. But to solve a variety of problems like the following gives the pupil increasing confidence in himself: Find the area of a plot 320 x 400 feet. Find the length of a room, the floor of which contains 600 square feet and the width of which is 20 feet. A room whose width is 15 feet is twice as long as it is wide, what is the area of this floor? How many square feet in a three-foot cement walk that runs around a garden 20 by 24 feet? What is the area of the walls of a room 30 feet long, 24 feet wide and 10 feet high?

The solution of these problems gives the child a better un-

derstanding of the formula, helps him remember it, serves to test his deepening insight into the relationship of length and width, and reveals to him his powers of arithmetical manipulation. The successful teacher is resourceful in devising a large number of well motivated forms of application and thus exercises what Pestalozzi called "a continual benevolent superintendence."

Further Development of Our Study.—The purpose of all education is to insure effective behavior. As self-activity expresses itself, it prompts one form or another of human behavior. We shall group all forms of human behavior into two classes, natural and acquired. Under the first we shall study inherent patterns of conduct, individual differences, the mechanism of heredity, instincts, impulses, feelings, and emotions; under the second, those forms of behavior that are unmistakably acquired in the course of a lifetime.

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QUESTIONS FOR DISCUSSION

1. What is the difference between growth and development?
2. Which of the following practices make for mental growth and which for mental development:
 - (a) Learning the names of the capital and of the largest city of each state
 - (b) Studying six large cities of different types in order to lead a class to infer the factors that determine the growth of cities
 - (c) Requiring the class to memorize mimeographed outlines of geography and history
 - (d) Teaching children methods of study rather than teaching them the essentials of school subjects
3. What are the weaknesses in Locke's *Blank Paper Theory*? If followed, what effect would it have on (a) the course of study; (b) methods of teaching?

4. Explain and illustrate: "Modern psychology explains mental growth by biological principles."

5. Arrange the following methods of teaching in order of probable effectiveness. Before doing so formulate your standard of good teaching.

- (a) Asking specific questions on an assigned text
- (b) Giving main topics and asking pupils to organize their ideas under each
- (c) Lecturing or telling
- (d) Requiring children to construct a multiplication table not yet taught by using such objective materials as splints or beans
- (e) Giving the multiplication table and spending time on drill
- (f) Presenting a problem which is interesting but which children cannot solve and which leads them to search for data in books
- (g) Giving the necessary materials and then requiring children to solve the problem referred to above

6. What method in each of the following lessons will make focal the necessary mental activities?

- (a) The significance of Valley Forge in the American Revolution
- (b) How to solve such problems as, "What shall I mark goods so that I may allow the customary trade discount of 20 per cent and still be assured a selling price of \$1.20 a yard?"
- (c) An oral reading of a poem for its auditory effect
- (d) The effect of topography on climate
- (e) Benedict Arnold's treason

7. Give an original example to illustrate each of the following:

- (a) Expressions of impressions make for greater accuracy in thinking
- (b) The motor expression "clinches a fact in consciousness"
- (c) "The chief business of the teacher is to suggest a suitable number of ways in which pupils may apply what they learn"
- (d) Learning is living; in effective teaching we give children experiences in modes of living

CHAPTER XVI

INDIVIDUAL DIFFERENCES IN CHILDREN

The Differences Among Children in One Class.—Membership in a group, whether racial, religious, or national, gives us an exaggerated impression of resemblance among people. While there is greater similarity than difference among humans, the extent of their differences is surprisingly great. A study of a class of forty children of the sixth grade reveals, among others, these marked differences:

1. Sex.

2. Age: a range of 8 years, 8 months, to 13 years, 2 months.

3. Height-weight: height: 46 to 63 inches; weight for height: 10 pounds below to 20 pounds above normal weight.

4. Health: every degree of health and vigor is represented, from the child who never takes cold and can defend himself most effectively, to the chronically ailing one who is unable to meet the simple physical demands of life.

5. Appearance: every shade of color of hair, eyes, complexion; every well-known cast of countenance.

6. General ability: (a) some are retarded three semesters, others accelerated three semesters, hence a range of six semesters; (b) in the time that the best do twenty examples, the poorest cannot complete five; (c) the best can spell words like *awkward*, *guarantee*, *receive*, *relieve*, *judgment*, but the poorest misspell *freedom*, *their*, *dollar*, *William*; (d) in penmanship, written English, general information, and mastery of factual geography and history taught in the school course, the range is at least as great.

7. Emotional stability: every degree of emotionalism is represented, from stolidity to hypersensitivity in situations that call for humor, pathos, sympathy, resentment, and æsthetic appreciation.

Fears: every type of fear may be noted, *e.g.*, fear of new situations, of difficulties, of bodily injury in games, of being censured, of darkness, of high places, of new foods—fears without end.

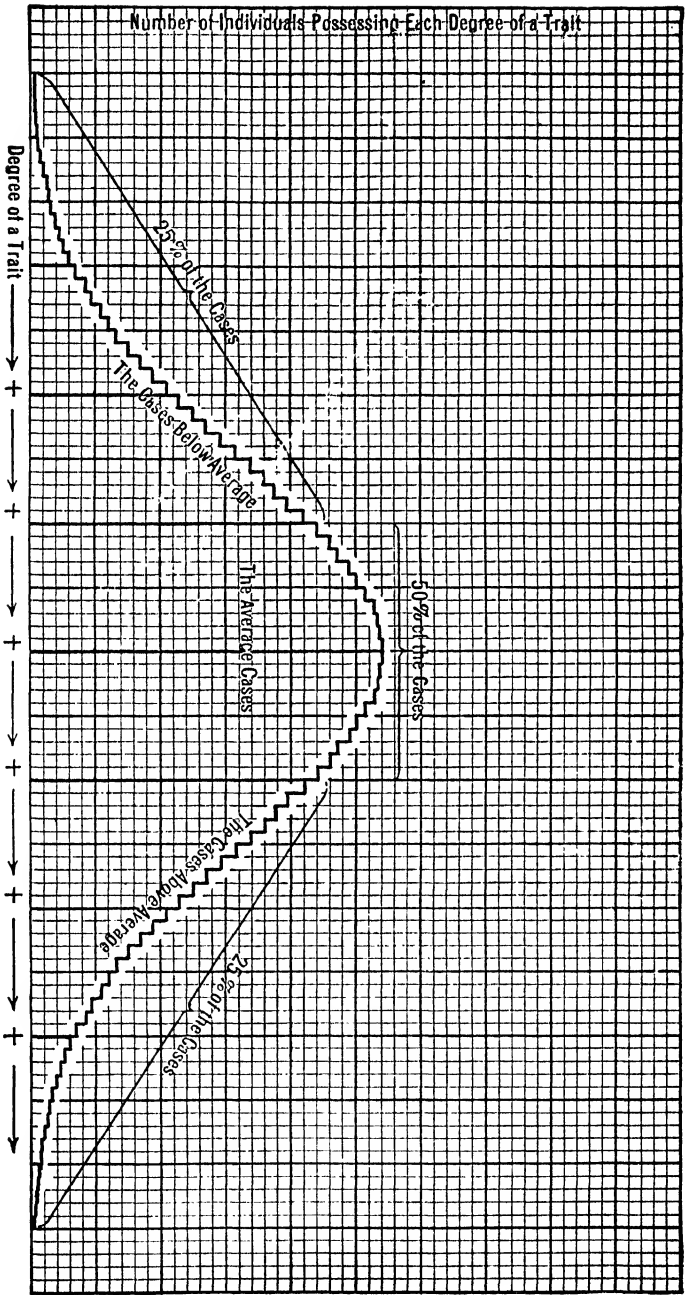


FIG. 5. CURVE OF NORMAL DISTRIBUTION

Home Influences: the children show themselves the products of homes of every degree of intelligence and orderliness and of every kind of social, racial, and religious character.

Having pointed out this much, we are forcibly impressed with the number of very significant differences that are not included in this tabulation. Confronted by this highly heterogeneous group of maturing boys and girls, the teacher must evolve a system of activities that will stimulate all children and that will do violence to none. Here is a task that requires fortitude, versatility, and a divine gift of patience, as well as careful and thorough professional training.

The Extent of Individual Differences.—*The Degree of Difference.*—The differences among individuals in psychological and biological traits seem to follow well recognized laws. If a large number of unselected ten-year-old pupils were measured for a mental trait, it would be found that their abilities would range, without break, from the lowest to the highest degree. Apparently the degrees of the traits are continuous so that gaps do not exist within the ranges of any recognized trait. Furthermore, the majority of the children cluster about the center. Expressing this distribution graphically gives us the curve of normal distribution.

If the range of abilities is divided along the base line into equal sections (as indicated in the diagram), the two middle sections include 50 per cent of the cases. The remaining 50 per cent of the cases fall on either side of the middle half, that is, 25 per cent fall below and 25 per cent above the middle group. An analysis of the curve reveals that the average is in the center, that the curve drops rather little, then very much, and finally very slowly. A child rated average in a mental trait is among the middle 50 per cent.¹

The degree of difference in any trait may be very marked or so small as to defy detection by the most expert. There are records of twins who were so similar that their own parents frequently confused them. Most people have met

¹Some students place the middle two-thirds of unselected children in the group designated as average.

twins so dissimilar that their relationship was not suspected. Plant and animal life abound with illustrations of extremely close but not absolute similarity, and of differences incredibly great.

Where a selected group is measured for a trait, the curve, instead of being bell shaped is skewed. If one hundred college seniors were given an ordinary intelligence test, one would expect to find few at the lower end and most at the upper because the students have gone through a process of selection in their high school and college careers. We see below the curves which represent the intelligence ratings of the various ranks in the army during the World War. Note how the curve is skewed for the enlisted men of limited literacy, for the enlisted men of moderate literacy and for those who attained the ranks of O.T.C. and officers. A further study of these curves will prove both interesting and instructive.

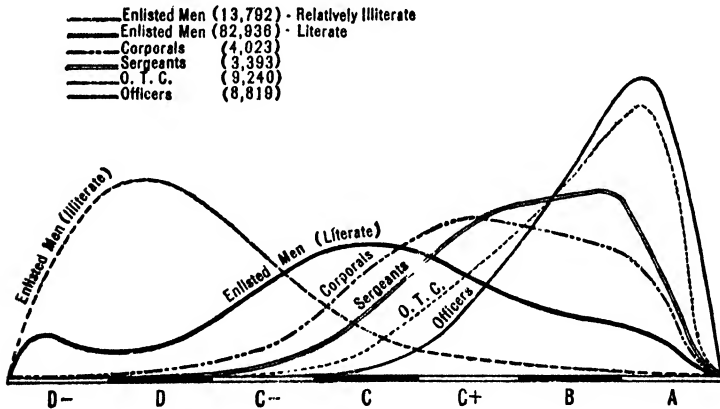


FIG. 6. GRAPHS SHOWING DISTRIBUTION OF INTELLIGENCE RATINGS IN TYPICAL ARMY GROUPS

The literate groups were given Army Alpha, and the illiterate groups the Army Beta.

Kinds of Difference.—We may group individual differences as physical and mental. The physical, we have illustrated in the introductory parts of this chapter and in the extended study of health education. Mental differences in a group

presumably homogeneous are usually very striking. A state wide survey of the intelligence of high-school students of Indiana reveals the following degree of difference. This table ²

Grade of Intelligence	A+	A	B	C+	C	C—	D	E	E—	F
Per Cent of the Total Group Who Made Each Score	2	6	14	22	11	19	13	7	5	1
	Above Median 44%				Med ian	Below Median 45%				

is self-explanatory. It shows that approximately the same percentage of high-school seniors are above as below the median (grade C) in intelligence.

Surveys of school systems reveal striking and unsuspected social and racial difference. Such a recent study brought to light, among other things, the following facts: ³

(a) Girls do better than boys in all grades in oral reading.

(b) Children of parents born in America did superior work in the first three years.

(c) Italian pupils were so seriously handicapped that the cause must be sought in reasons additional to limitations of language.

(d) "The children in Jewish schools are distinctly ahead of average Cleveland pupils. . . . In spite of the fact that they are often surrounded by poor economic conditions, and that they often use a foreign tongue, these children seem able to rise above their handicaps better than any other nationality under similar conditions."

(e) The Poles and Bohemians, slow the first three years, made the average grade in the next four years and then dropped below the average in the next three.

These instances are cited not because they establish final truths, but rather because they show the extent of individual

² W. F. Book, *Intelligence of High-School Seniors* (Macmillan Co., 1922), p. 23.

³ C. H. Judd, *Cleveland School Survey* (Cleveland Foundation, 1916), p. 139.

differences and reveal the colossal problem which confronts public education in a cosmopolitan urban community.

Our studies indicate that two important talents unrelated to general capacity are ability in drawing and music. Children of only average general ability may be gifted in either or both of these forms of self-expression. The converse is just as true—children of high general intelligence may show relative deficiency in art or music or both. We must not explain this seeming anomaly by a law of compensation—that children proficient in certain fields must be backward in others. Nature does not follow human notions of justice. We have ample evidence for believing that the child who is mentally superior generally retains his superiority in most situations.

Causes of Individual Differences.—The factors which seem to produce these individual differences are usually given as (a) remote ancestry; (b) near ancestry; (c) sex; (d) social environment; (e) training. The biological grouping is simpler. Remote and near ancestry may be regarded as a single factor since they refer to an individual's inherited stock. His sex is likewise the resultant of the mechanism of inheritance. Hence one causative agent is *inheritance*. A second is the *environment*, including its formal training through teaching as well as its informal influence through human contacts. The inherited equipment of the child we shall consider in this section of the book; the acquired modes of behavior, imposed by environment, we shall treat more fully in later chapters.

Conclusions for the School.—The recognition of the mere extent of individual differences brings redoubled effort to individualize the processes of formal education. What is the school trying to do to meet these far-reaching differences in individuals?

1. *Greater Attention to Grouping Children.*—Great strides have been taken to break down the old system of grouping children alphabetically or by height. About 70 per cent of the city school systems of the United States now follow a system of homogeneous grouping. Children of superior, average, and slow mentality now form distinct classes. Courses

of study and methods of teaching are differentiated according to the ability of the group taught. A plan of quarterly promotion is advocated in other communities. With a shorter term, the measure of achievement comes more frequently and the gifted child need not wait for the end of a half-year term for advancement. The pupil who fails to advance finds himself retarded only ten, not twenty, weeks.

Children with special disabilities are now placed in classes designed especially for them. We have special classes for the retarded, for the mentally deficient, for the crippled and the feeble in health, and for the socially maladjusted. A large city school is a complex organization striving to minister to a host of individual needs.

2. *Individualization of Instruction.*—In the face of these individual differences, class instruction must become highly individualized. The mode of approach and the method of learning must be changed according to the capacities and attitudes of homogeneous groups of pupils. For the slower child, there must be more obvious motivation and greater learning through manual construction. Such children do not understand the explanation of a standardized measure. Two vessels, each containing what purports to be a gallon, are shown. They are compared and the children see that one contains more glassfuls than the other. "Which gallon would a dishonest owner of a gasoline station use? How can you tell whether you are really getting the quantity to which you are entitled when you buy five gallons of gasoline?" Out of such a situation grows the realization of the need of a standard gallon. To tell these children that 231 cubic inches make a gallon, gives them little light. They cannot conceive "231 cubic inches," nor do they understand the meaning of "make a gallon." They must actually fold cardboard into a box measuring 7 x 11 x 3 inches; they must fill it with sand and then empty the contents into a gallon measure; they must then compute 7 x 11 x 3 and discover the 231 cubic inches. Now they understand why the state inspects weights and measures and what is meant by a standardized unit of measure. The process is slow but it is better to teach fewer ideas and

insure a real basis for each concept, than many ideas which are doomed to remain empty words.

The abler children need less concrete demonstration. After a few judicious questions are asked, their faces give evidence that they understand the need of standard units. They can imagine the standard gallon without going through the time-consuming manual tasks planned for the weaker ones. These children learn much from books; they take more kindly to problems propounded by the teacher; they are more responsive when a project is presented for analysis, planning, and execution. With them, we stress modes of study and the acquisition of study technique, so that their capacity for independent achievement may keep pace with their promise.

The *Dalton Plan* individualizes instruction by organizing most of the subject matter into a series of well graded study units or "jobs." To complete the arithmetic or the spelling of a grade, one must complete the units of work or "jobs" in these two subjects. Each job-card tells what is to be mastered, gives directions for work, refers to explanations and exercises in books, and then indicates a mode of self-checking. No child goes on with an advanced job until he has completed the preceding one.

The classroom of the *Dalton Plan* is a workroom. The children ponder over their tasks and try to help themselves. When completely baffled, they appeal to the teacher who gives direct aid or mere guidance depending upon the specific circumstances. Here the teacher is invited to help the pupil; in the ordinary classroom, the teacher always imposes himself upon the class.

At the beginning of the school week or month, the older pupils in the *Dalton Plan* are given their jobs in all their subjects. A child may decide to complete four of his ten jobs in arithmetic before beginning his first job in geography. So long as the pupil gives evidence of honest effort to complete all tasks in all subjects of the week or month, the school makes no serious objection. The child who does not appear in the geography class, or in the arithmetic class for a number of days, is called for conference with his teacher. If his

reason is sensible, he is allowed to go on in his own way.

Subjects whose content deals less with skills or arbitrary data and more with problems of social importance are reserved for class conference. Here the method of teaching approximates the problem and project recitations of the more conservative classrooms.

Children progress at their own rate. They learn to apportion their available time among their several duties—they plan their own days. In a normal class, children know that the teacher will fill the day for them; if any work is omitted, the teacher, not the pupils, is to blame. In too many instances, the teacher is the only person who knows when the present task may be put aside and what the next activity will be. In these classrooms, when the children are through with a reading lesson, they wait not only for the next assignment, but for the very command to put away the books which they no longer need. Surely, it is not surprising that under such military control with its excessive teacher domination, children fail to exhibit any desire for active participation in the class activities and to develop self-reliance and initiative.

The *Dalton Plan* teaches children methods of study and, through adequate practice, develops the set of habits that make study an effective means of learning facts and acquiring intellectual skills. Books are regarded as storehouses of information to be consulted as definite needs arise, rather than material to be committed to memory.

In the final analysis, the *Dalton Plan* presents a system of teaching not unlike the best types of correspondence teaching, but with provision whereby the contact between pupil and teacher is direct and intimate, rather than by mail. The *Winnetka Plan*, frequently referred to in current educational writings, aims to individualize instruction by devices not unlike those found in the *Dalton Plan*. Subjects of the curriculum are carefully graded, each step in the gradation becoming a contract to be accepted and carried out by the pupils. The morning sessions are devoted to individual study under a system of supervision similar to that used in the

Dalton Plan. The socialized recitations, in which a group works together and thinks together, are reserved for the afternoon session. Work is differentiated for the superior, the normal, and the slow; while all study the same general set of subjects, the content of the lessons and the contracts are determined by the capabilities of the group. There is little in the *Winnetka Plan* that one cannot adopt for almost any school that is progressive and alive to its obligation to the individual child.

Although little active opposition has developed towards the *Dalton Plan*, school authorities in the United States have given it only passing attention. They argue that not all types of children will thrive under such a system. They hold that the intelligent child, quick to understand and, hence, ready to make new adjustments, will undoubtedly fall into this routine, but the less capable pupil needs guidance and constant supervision. Nor can the *Dalton Plan*, the argument runs, be employed in large schools where classes rarely contain less than forty and often as many as fifty pupils. These issues can be decided only by experiment. The *Dalton Plan* holds enough promise to warrant trial with children of different types and in urban schools with large classes. The data now available for dispelling these doubts come, in many instances, from professed friends of the plan. Nor can we draw a final conclusion by pointing to the rapid extension of the *Dalton Plan* in England. Adoption of the plan elsewhere is no guarantee that it can meet the unparalleled conditions in American schools.

Some opponents condemn the system because it gives not new curriculum material but a new device for helping the child learn the same dreary array of facts that no longer prepare for effective living in our day. Such an assertion gives evidence of mere contentiousness. The adherents of the *Dalton Plan* insist that it can be applied to existing curricula. If these be cluttered with useless experiences, then the duty of school authorities is obvious.

Others are much perturbed by the shiftless pupil who would not complete his jobs in the given time. Why make a new

problem of an old one? What does the school do with the indolent pupils who look vacantly into space as the teacher develops lesson after lesson? Whatever has been found effective can be employed under the *Dalton Plan*. Nor can we respect the complaint that excessive work would be thrown upon the teacher. In the semester in which any new plan is established, an inordinate amount of labor falls on the shoulders of supervisors and teachers. After the introductory months, teachers would make different types of preparation but the total amount of work would not necessarily be increased.

It is perhaps needless to add that no school should adopt the *Dalton Plan* or any other plan to individualize instruction until the new system has been studied carefully, and, every teacher is sympathetic enough to the proposed procedure to carry it through without predispositions and mental reservations.

3. *The Need of a New System of Supervision*.—Individual differences, we agreed, make necessary, first, scientific grading of children, and second, individualized instruction. But both of these practices are dependent upon a system of supervision in which personal opinion, so often capricious and inaccurate, is supplemented by objective measurements. The school that does not employ individual and group intelligence tests, and standardized achievement tests, and which does not give periodic physical examination by competently trained nurses or physicians, does not really know its children. It cannot, therefore, grade them scientifically nor really individualize its instruction. A fuller treatment of these tests will be given in later chapters.

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QUESTIONS FOR DISCUSSION

1. Make physical measurements of twelve children of the same sex and of approximately the same chronological age. Secure data on height, weight, chest expansion, strength of grip, hearing, vision, height of jump, length of standing broad jump, and ability to chin up. What differences do you find? Where norms can be secured, point out the variations from them.

2. List the different kinds of special classes in the schools of your community. What additions are needed?

3. What changes would you make in content and in methods of teaching for each of the following groups:

(a) gifted children .

(b) anæmic children and those physically subnormal in other respects

(c) children who are dullards but still must be classed with those distinctly above the feeble-minded

4. Give a specific instance, out of your own personal experience, where knowledge of individual differences helped the school in caring for a child.

5. Study the grades given by one of your instructors. Arrange these grades in order of rank and then plot a curve for them. Compare the distribution of these marks with the curve of normal expectancy. Do the grades follow the curve? Explain the discrepancies.

6. Suppose the curves of the instructor's grades, term in and term out, were always skewed toward the high grades, what conclusion would seem reasonable?

7. "Dull children will never show marked ability along particular lines." Point out two significant exceptions.

8. Some institutions give students quality credit. Thus, for a grade of A the student receives a bonus of $\frac{1}{4}$ of the credit of a course; for B, $\frac{1}{8}$; for C, no bonus nor penalty; for D, a penalty of $\frac{1}{8}$. Hence a 4-credit course gives an A student 5 credits, a B student, $4\frac{1}{2}$ credits, a C student, 4 credits and a D student $3\frac{1}{2}$ credits. In the light of the facts discussed in the chapter, do you approve of this plan?

9. Do you support or condemn these practices? Why?

(a) All children should be given the same amount of homework

(b) All children should be allowed the same time in a test

(c) All college students should be limited per semester to $\frac{1}{2}$ the number of credits required for graduation

(d) Full credit for a course should be given to any student who passes a creditable examination; only to those students who pass the examination with an especially high grade

10. What is the value of making a distinction between near ancestry and remote ancestry in seeking an explanation of individual differences in heredity?

11. Is the extent of individual difference a social asset? Why?

12. "The *Dalton Plan* merely brings back to our day the little red schoolhouse with its many groups studying from textbooks." Is this characterization just? What are the distinctive features in the *Dalton Plan*? What values or limitations other than those listed in this chapter can you present?

CHAPTER XVII

INHERITANCE, THE ORIGIN OF NATIVE BEHAVIOR

Meaning of Inheritance.—Our study has concerned itself thus far with individual likenesses and differences. We turn now to an inquiry into their probable origin. When the child is still young, we discern traits that will remain throughout its life. What predetermines the individual in ways which defy the most potent influences in his social environment and the most arduous formal training?

Galton¹ and Thorndike,² among others, made careful and extended studies of twins. They report twins so similar that their teachers could not tell them apart. Despite similarities of appearance and of environment, each individual developed mental traits and modes of social behavior which readily distinguished one from the other. Twins separated early in life and brought up in surroundings very different, nevertheless develop certain external likenesses. Nothing can repress these similarities; it is just as difficult to obliterate the differences inherent in any individual. Hence the origin of such expressions as, "Blood will tell," or, "Breed will out."

Each living organism is therefore determined by environment and heredity. By heredity, we mean, roughly, the sum total of resemblances between parents and offspring; by environment, the sum total of all the influences brought to bear on the inherited mechanism. Inheritance gives an organism its basic structures and qualities; changes in environment, give it numbers of opportunities, as yet unestimated, to modify these basic structures and qualities.

¹ Francis Galton, *Inquiries into Human Faculties* (E. P. Dutton & Co., 1883).

² E. L. Thorndike, "Archives of Philosophy, Psychology and Scientific Methods," No. 1, 1901.

Mechanism of Inheritance.—The discovery of the laws of inheritance has, therefore, become vital in biologic research and has produced a specialized field of inquiry, genetics. Out of genetics has developed the idea of improving the human race by genetic methods. The application of the laws of genetics to human beings is known as eugenics. In sharp contrast, we find euthenics, the study of appropriate modes of improving the physical and social environment. While the protracted period of infancy and the educability of the human being make the social environment very significant, the study of the modes of inheritance is, nevertheless, primary.

Some Observable Facts Concerning the Importance of Unit Characters.—For purposes of illustration, we shall turn to a simple example and analyze it as biologists do. If a black guinea pig (whose ancestry is known to be black) is mated to a white guinea pig (whose ancestry is known to be white), all the offspring (which we shall designate as F_1) are black. There are no white offspring from this union. Now let us mate the members of this first generation, F_1 , to each other. If a sufficient number of offspring (called F_2 generation) are born, it will be found that there are two kinds of baby guinea pigs, one kind black like the one grandparent, and the other, white like the second grandparent. Clearly, there is discernible an alternation of generation. The biologist can predict, under such experimental conditions, not only what colors will be inherited, but also what percentage of the children will have the one trait or the other.

Further analysis reveals that when the white grandchildren are inbred, that is, mated to one another, all subsequent generations are white. There is no influence of the black, even though blacks and whites have had so intimate a relationship as a common parent. The black grandchildren, however, are of two kinds, indistinguishable by outer appearance, but absolutely different internally, that is, genetically. The one kind breeds black offspring, generation after generation. The other kind gives birth always to two kinds, namely, black, as black as the ancestors, and white, as white as the ancestors, and in definite proportions. We have thus seen, in a sample

illustration, different ways in which a trait is inherited. By proper breeding methods, it can be determined whether a given trait will breed true, as the white in the illustration, or as the one kind of black, or, whether it will split up as in the other kind of blacks. While we cannot predict what trait a particular child will possess, we can predict, in a large number of births, the proportionate numbers having the trait and also the alternate inheritance.

The accompanying diagram (Fig. 7), presents the story more graphically. In the first column we have represented the facts observed; in the second, the genetic explanation. The symbol \times , indicates that the animals on either side have been bred.

The Explanation of the Observable Facts.—A group of scientists, the cytologists, in studying the structure and the behavior of the germ cell corroborated independently the phenomena just described and evolved an explanation of the process. We can do little more than present a crude summary of their explanation.

Geneticists and cytologists agree that the nucleus contains the determining substances in heredity. Further study shows that within the nucleus is a group of small bodies, called chromosomes, which carry the determining hereditary bodies. Hence, elaborate studies have been made of these chromosomes. All the nuclei of the body contain the same number of chromosomes. The human body has forty-eight; but in the process of preparing for fertilization (ripening) the egg and the sperm cell each casts off half the chromosomes. Hence the fertilized egg contains one-half of the chromosomes contributed by the father cell (sperm) and one-half of the chromosomes contributed by the mother cell (ovum). After fertilization, there occur rapid cell multiplication and differentiation to form the embryo; further multiplication and differentiation result in the adult organism. Throughout these cellular divisions there is an amazingly complicated series of processes, called mitosis, which result in an exact division of each chromosome. As a result of mitosis, each daughter cell contains a quantitative division of each chromosome.

The OBSERVED Facts Concerning the Inheritance of Unit Characters

EXPLANATION of the Observed Phenomena
 Symbols representing substances for color in

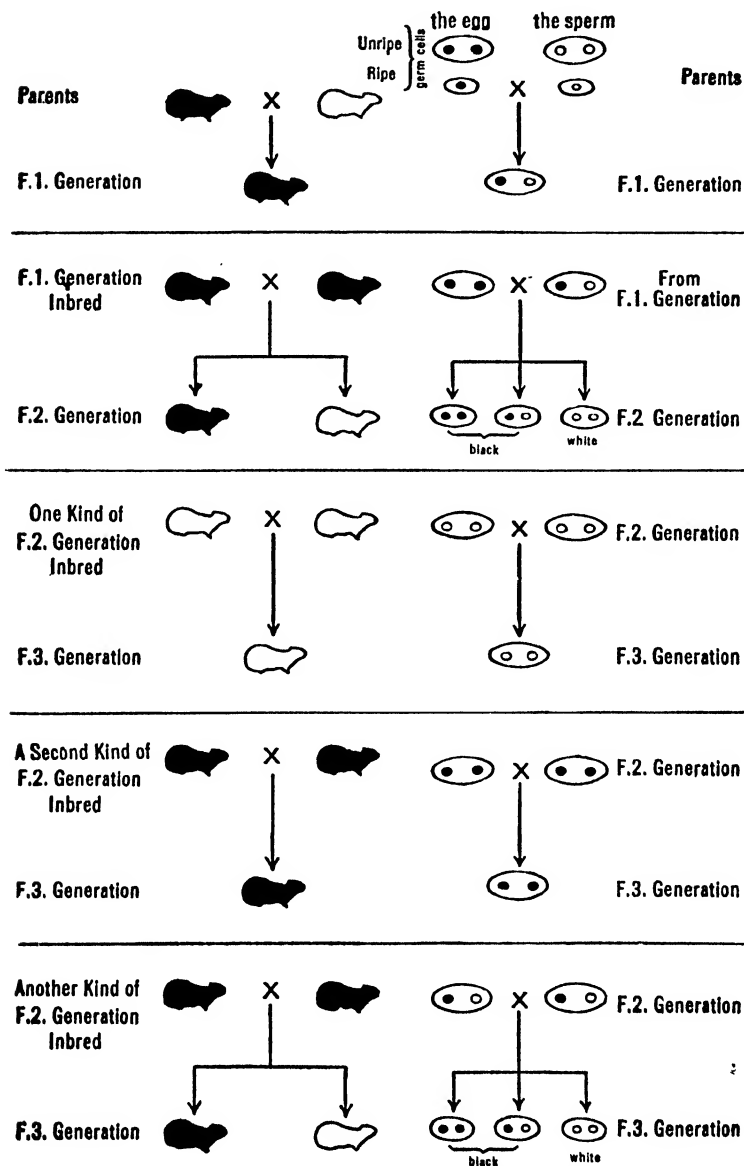


FIG. 7. INHERITANCE AND GENETIC EXPLANATION

So much for the story of cell division. Because of overwhelming experimental data, which is both cumulative and consistent, we are led to believe that each chromosome contains a very large number of genes. In no animal has the complete number of genes been determined; whatever their number, each gene determines one or more characters in the organism. It has been found that several different genes may supplement each other in determining a given character. While genes cannot be seen, we infer their existence from the results of heredity, just as in astronomy we infer the presence of unseen stars by their effect upon visible neighboring stars. These genes behave as "discrete packets of chemical molecules." The interrelationships, where so many factors are concerned, are therefore almost beyond number.³

Let us trace the history of the gene in the simple illustration of the heredity of a single unit character; it is set forth diagrammatically in the second column of Figure 7. The one parent guinea pig has a gene which gives rise to blackness of fur; the other parent, to whiteness of fur, represented by black and empty circles, respectively. The *ripe* egg and the *ripe* sperm will each have half the number of chromosomes; in our example, ignoring all chromosomes and genes excepting for color of fur, the egg contains one substance for blackness, the sperm, one for whiteness. The child will have in all its cells, two genes, one gene for blackness and one gene for whiteness. The child is black, because black is dominant over white, but its germ cell, though the body be as black as the parent's, is not the same as the parent's, for it contains

³ "We inherit twenty-four paternal and twenty-four maternal chromosomes: possible permutations, 16,777,216. That is nothing. That only refers to possible permutations for one single specific pair of individual germs. Counting potential germ capacity for the life of one pair of parents gives us the tidy range of total possible different combinations in all the fertilizable ova as 300,000,000,000,000.

"Now imagine that we deal, not with a mere forty-eight chromosomes permutation system, but with forty-eight chromosomes, each consisting of 'countless' chromosomeres (genes), each a possible bearer of heredity! In that case, as Thomson says, each human germ cell would be 'absolutely unique'—and undoubtedly is." G. A. Dorsey, *Why We Behave Like Human Beings* (Harper & Bros., 1925), p. 113.

substances for white as well as for black. The parent, it should be remembered, produced one kind of egg in respect to color. The F_1 produce two kinds of eggs with respect to color. The sperm, similarly, contains two kinds of substance with respect to color. Hence, the chance mating of these germ cells gives rise to two kinds of offspring: black and white, F_2 . The white offspring contain genes for whiteness only and therefore breed true (F_3 generation). The black offspring (F_2), externally indistinguishable, breed very differently: one kind of black, containing genes for blackness only, gives rise, for successive generations, only to black; the other kind contains genes for blackness and for whiteness, and gives in every generation, 25 per cent white and 75 per cent black children.

Biological Explanation of Individual Differences.—The biologist sees individual variations as the result of the different permutations and combinations in which genes distribute themselves in the germ cell. The way to produce people of absolute similarity, according to the theory of the gene, is to insure identical genes in each human fertilized ovum.

We do know that nerve tissue can be stimulated or irritated and can conduct a stimulation through a series of electrochemical changes. Each nervous system becomes, therefore, a cumulative record of these neural irritations and reactions. Each neural impulse, as it passes from the point of reception to the end of its path in the cerebrum, produces a modification or nerve pattern which is distinctly its own. These nerve patterns when repeated become the foundation of our preferred reactions, that is, of our habits, for repeated neural patterns tend to persist. The neural elements that are combined to produce a nerve pattern run into the millions. The character and the intensity of the resulting patterns may vary so greatly as to defy enumeration. Hence the acquired forms of human behavior may be as varied as the gene groupings.

The Inheritance of Mental and Moral Traits.—That there are genes that correspond to mental characteristics is probable. It is not possible to make out as clear a case for the

inheritance of mental traits as we can for the physical. The difficulty arises in our inability to analyze a mental characteristic and reduce it to its simple heritable units.

Most eugenicists believe in the inheritance of mental capacities. The evidence they adduce invariably takes the form of family histories. They point to Darwin and his illustrious antecedents; to the six generations of Bachs with forty-seven musicians of repute; to Titian descended from a line that boasted of nine painters; to Raphael, Van Dyck, Murillo, Rosa Bonheur, all illustrious artists from families known for their art achievement; to long lists of scientists, warriors, statesmen, and littérateurs whose genealogies show that their kin achieved distinction in similar fields of activities. Galton tells us that of forty-two painters regarded as leaders in Italian, Spanish, and Flemish art, he found twenty-one whose very near relatives were prominent artists.

In America, the Edwards family, descended from Jonathan is held up as an example of inheritance of high intelligence that is in close keeping with stern moral qualities, while the Juke and the Kallikak families are the horrible examples of the degradation that may be expected if those of feeble and depraved mind are permitted to have offspring. "Max," the progenitor of the Jukes, was born in 1720. He was a reprobate who would not work and left New York City to live in the country with a prostitute. There, others of his ilk joined him and continued to propagate in an environment isolated and completely cut off from contact with their betters. "Of Max's 2,000 descendants, 1,200 were occupants of penal and charitable institutions previous to 1874. . . . They cost society about \$1,000 each or a total of \$1,250,000." About 600 were feeble-minded; 310 were in poorhouses; 300 died in childhood; 300 were prostitutes; 7 were murderers; about 140 were convicted more or less often of crime.

But in all these illustrations, we have no way of eliminating the influences of environment. What would the child of model parents become if it were brought up in a highly isolated community that had neither school nor church, and abounded with homes where sex indulgence was lawless and rampant?

The Edwards family is traced to Jonathan, the severe Puritan preacher, who threatened his flock with fire and brimstone. Those who carried this line of reputed purity farther back report that it is not free from sex looseness and criminality. In addition, we must bear in mind that records are not reliable as we go back more than one generation. What was regarded as a vicious disease or criminal conduct seventy-five years ago may be diagnosed to-day as an unfortunate skin ailment or a pardonable fall from social grace. All one can conclude is that it seems reasonable to assume that such extremes in conduct as are exhibited in these family histories must be traced not only to heredity but also to environment. But we have no way of ascertaining how many minds capable of superior behavior were stifled in the degradation of the Juke or Kallikak surroundings.

Feeble-mindedness is inherited as a recessive trait, according to Goddard's data of family histories. The person of low-grade intelligence is unable to cope with the complexity of modern life and soon falls into unsocial practices. "At Newport News, during the war (World War), the prostitutes were under government supervision and 88 per cent were found to have a mentality of eleven years or less."⁴ Cyril Burt⁵ gives us much data based essentially on case histories. From these we may safely conclude that genes for criminality are not inherited but that feeble-mindedness is. Inferior mentality predisposes the individual to a life of delinquency but does not exercise an inescapable drive towards criminality.

The Inheritance of "Acquired Characters."—*The Significance of the Problem.*—Each organism has two types of cells, body (somatic) cells and germ cells. Our survey of the mechanism of inheritance has shown that inheritance exercises a determining effect upon the individual. In other words, the genes in both ovum and spermatozöon, determine the body cells. An interesting question, vital in its implications for

⁴ E. R. Downing, *Human Inheritance* (University of Chicago Press, 1926), Ch. XIV, p. 432.

⁵ Compare Cyril Burt, *The Young Delinquent* (D. Appleton & Co., 1925), p. 56.

human progress, is whether body cells can influence germ cells. Can any change in the body cell of the parent influence the germ plasm and thus be continued in the offspring? Can musical ability or mathematical expertness, developed solely by arduous practice, be transmitted, in any degree, to the offspring? Will parents who overcome their weak constitutions by a life of regularity and outdoor activity produce progeny of greater physical promise? Does the dissipation of the parent predetermine the health of the child? Does each new generation begin life with greater handicaps or greater advantages than its parents or does each generation begin at precisely the same point as its predecessors? The answer either heartens or discourages those engaged in education. The question is not new but its solution is sought for just as earnestly as when it was first propounded.

The Affirmative Side.—Lamarek, Haeckel, Eimer, and Spencer are among the illustrious champions of the principle of the inheritance of "acquired characters." Typical of the evidence adduced to prove their contention, we find the following:

Blindness of the fishes in Mammoth Cave and of the moles who live underground is inherited. These animals were originally gifted, it is assumed, with sight. Because of their environment, the eyes did not function, eyes and nerves atrophied through disuse and each generation inherited progressively less complete eyes until blindness occurred.

"Bad eyes" among watchmakers and "nervosity of certain trades" are also, it is asserted, transmitted from parent to offspring.

Proper feeding and physical care improve cattle. The better bodies of the one generation are inherited by the next.

To the Lamarekians, these are proofs of the inheritance of acquired traits. If we deny this, then Spencer asks, "How can we explain instincts? . . . Either there has been inheritance of acquired characters or there has been no evolution."

The Negative Side.—Most biologists side with Weismann in opposing the belief in the inheritance of acquired traits. They argue, correctly, to be sure, that in every organism, each character and characteristic, such as weight, color of skin, or

length of tail, varies considerably. The accompanying curve shows the range of distribution of a large number of animals for any one of these characteristics. If we assume that the average height of human beings is 5 feet 6 inches, then people having this height form the largest group for height. As we count those smaller and those taller than 5 feet 6 inches, we find that the numbers decrease gradually. On the vertical axis we represent the number of people, on the horizontal, the height in feet and inches.

The normal distribution is represented by the normal bell-

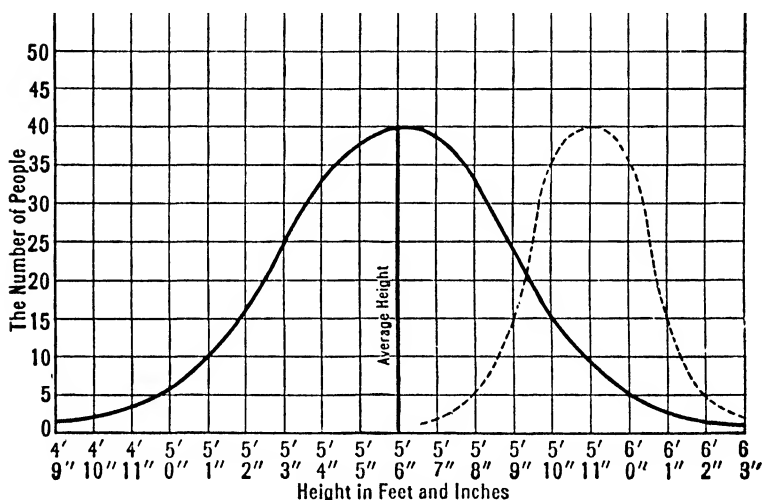


FIG. 8. DISTRIBUTION IN A NORMAL AND IN A MODIFIED GROUP

shaped curve drawn in solid line. If we now breed for any one character or characteristic, and select only those that have the specific character in question, we can produce a changed group, which in its turn produces individuals showing more height. The group picture is now changed and assumes the curve indicated by the broken line in our diagram. *But the individuals of this changed group have no greater height than some individuals of the original group.* The offspring of this highly bred group, when non-selected, that is, mated at random, revert to the original distribution of group. We may obtain a similar change in a group picture by assuring

the members of that group an unusually favorable environment. Cows, subjected to special diet and freed from every source of annoyance or even discomfort, will produce more milk. But here, too, no cow in the changed group will produce more milk than some individuals in the original group. The same conclusions are reached when we select negatively or when nurture is unfavorable. By nurture or by selection, we saw, one can change the picture of the distribution of a group with reference to any one character or characteristic, but there is no continuance of this new distribution unless the nurture or the selection persists. While the body can be changed, within limits, there is no evidence that, even after hundreds of generations, the changed body changes the germ plasm. Our illustrations have dealt therefore with changes in the soma only, and these, we saw, produce no changes in the germ.

Let us stress the point by other illustrations: Cattle can become emaciated to the verge of death or they can be fattened to their highest possibilities. Legs and wings of ducks have no absolute length; they vary considerably. The speed of which horses are capable varies as their other physical possibilities. Under favorable conditions and new methods of training, the limit of maximum possibilities may, at times, be attained and the latent capabilities of the species, realized. But with the best fodder cattle will not grow beyond a fixed limit; with the longest confinement wings of ducks will not become dwarfed below the present minimum, and with the most expert breeding the time of the trotting horse cannot be reduced appreciably below the lowest records now held. Any of these characters or characteristics that can be measured has a maximum and a minimum limit. As was shown, if enough individuals are carefully trained, one or the other limit can be attained but not transcended. But in none of these instances do we find evidence of a germinal change produced by a change of soma, that is, inheritance of an "acquired character."

We have yet to prove that blindness of the fishes in Mammoth Cave is not due to the development of a mutant among

the fishes in the cave, or that the excess lime in the water is not responsible for the blindness, or that the fishes originally had functioning eyes. Where is the evidence that the child of the individual whose sight was impaired in a particular trade will start life handicapped with "bad eyes"? The watchmaker's children probably took early to their father's trade and undermined their sight in youth by working with inadequate light.

Evidence in support of the failure to transmit "acquired characteristics" is plentiful. Mutilations, such as perforations of ear or nose, circumcision among Jews, twisted feet of Chinese women, and totem marks among savages, are never transmitted. "Acquired" intellectual characteristics are also not transmitted. The parents who develop a taste for art do not necessarily have artistic children. A Russian child, whose ancestors spoke only their native tongue, will, if placed in thoroughly American surroundings, acquire the English language with facility. The same tendency is seen in the moral sphere, for the acquired vices or virtues of parents are not necessarily given to their children. Much that is acquired by imitation is often mistaken for acquisition through inheritance. Only in so far as the mother's mode of life affects her health during pregnancy, does immorality have a determining influence upon the health of her progeny. Ovaries transplanted from a black guinea pig of black ancestry into a white one of white ancestry will produce black guinea pigs with not a single trace of the foster mother. This instance is typical of the usual independence of the germ plasm from body or somatic influence.

We turn now to a different type of illustration, not infrequently cited as evidence of transmission of "acquired characters." The offspring of an alcoholic parent or of a parent suffering from lead poisoning or of a syphilitic parent shows physiologic malfunctioning traceable to alcoholism, lead poisoning, or syphilis. It does seem as if in these cases the "acquired characteristics" of the parent have been transmitted to the progeny. But by the technique of physiologic chemistry, we can prove that alcoholism and lead poisoning and syphilis

have modified the germ plasm as well as the somatic or body cells. No one disputes the fact that changes in the germ plasm produce changes in the offspring. In the instances just cited, there is produced a direct physical and chemical change of the germ cells as well as of the body cells. The stimulus may be alcohol or lead poison or syphilis; the result is an acquired (somatic or body) change plus a germinal change. To prove inheritance of "acquired characters," we must prove that modifications limited strictly to somatic cells have modified the germ plasm. These cases, again, clearly fail to prove inheritance of "acquired characters" for we have not yet demonstrated experimentally that somatic cells affect the gametes (egg or sperm).

Present Status of the Dispute.—Such experiments as have been made by thoroughly competent biologists give no basis for the belief in the transmission by inheritance of "acquired characters." There are records of incomplete studies that seem to indicate that "acquired characters" may be inherited. Such work as has been reported by Kameron and Pavlov await corroboration by more complete experimental inquiries. Pavlov, the Russian physiologist, trained mice to come to a particular place for food. He found 300 repetitions or lessons necessary to develop this reaction in untrained mice. The second generation of these trained mice required only 100 lessons; the third generation, 30 lessons; the fourth generation, 10 lessons; and the fifth, only 5 lessons. What the complete study will show, we cannot tell. We cite these facts here merely to stress that competent biologists⁶ believe that the Lamarckian doctrine is a possible principle of evolution, but, at present, an unproven one. While educators and biologists realize the significance of the implications involved, they are at present eagerly awaiting any valid evidence for the inheritance of "acquired characters." But in this very eagerness for the answer, they must not accept proof from phrase makers who write for popular magazines, but continue

⁶ H. H. Newman, *The Nature of the World and Man* (University of Chicago Press, 1926), p. 412. G. H. Parker, *What Evolution Is* (Harvard University Press, 1926), p. 97.

the patient search for the answer in adequately corroborated analytical experimental proof.

Social Implications in the Mechanism of Inheritance.—*The Two Schools, Nature and Nurture.*—The full social significance of the laws of inheritance has given rise to two distinct schools—one led by the eugenists and the other by the geneticists and the psychologists. The geneticist is so impressed with the significance of germinal changes that he tends to exaggerate the importance of breeding. The psychologist, an interested observer of environment, stresses social factors in human adjustments. The eugenist has broken the restraining bonds of rigorous experimental technique and, having taken surprising liberties with the findings of the geneticist, has become the advocate of controlled breeding among human beings. To both the geneticist and the eugenist a determinism operates at the moment of inception. The two parents set the limits of possibilities for their offspring. The environment they provide for him cannot help an individual grow beyond the range they fixed for him in the process of conception. The laws of inheritance are indeed most rigorous and most irrevocable.

The Grim Doctrine of the Eugenist.—The eugenists, who cannot obtain what the geneticists demand—ample experimentally verified proof—nevertheless feel free to draw sweeping conclusions concerning inheritance in human beings. They teach that society shall enjoin the prevention of certain births; that, though marriage be a private contract, its consequences are inescapably social. They speak eloquently of the right of every child to be well born. This right will not be safeguarded, they believe, until people learn that marriages are divinely sanctioned only when parent selects parent for desirable qualities which will be transmitted to offspring. For the consummation of a holy alliance, the advice of the physician and the biologist is as necessary as the sanction of the minister.

No mere sentiment, says the eugenist, but grim fact makes it necessary for society to deny certain of its members the right to breed their kind. The New York Institute for the

Deaf and Dumb⁷ presents statistics that show that of "3,492 children resulting from 833 marriages (both parents deaf), 1,134 were defective" in mind or body. Marriages contracted by 62 epileptic males and 74 epileptic females produced 553 children; "of these 22 were stillborn; 195 died during infancy from spasms; 78 lived as epileptics; 18 lived as idiots; 39 lived as paralytics; 45 were hysterical; 6 had chorea; 11 were insane." Less than 25 per cent of the issue of these unions were normal individuals, but even these did not escape the inevitable tragedies, for the third generation often pays the price not exacted from the second. One feeble-minded man left at large in the early history of Ohio is known to have 75 feeble-minded persons among his living progeny.⁸ And, these, undoubtedly, go on propagating, accentuating the problem for the future.

The following chart is a graphic representation of the per-

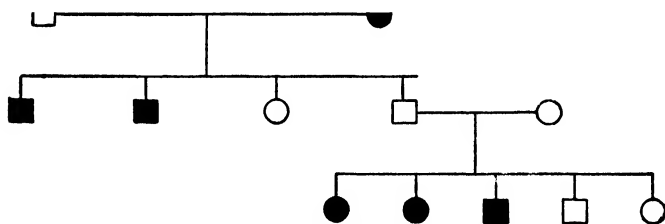


FIG. 9. INHERITANCE OF A DEGENERATIVE STRAIN

petual tragedy that is being enacted among the feeble-minded, according to eugenists. Black spaces represent the feeble-minded and the hopelessly diseased, the blank ones, normal progeny; squares represent the males and the circles, the females. We need analyze only two typical cases to realize how unmistakably, according to the eugenist, blood will tell. Figure 9 represents the results of the union of a normal man with a feeble-minded woman. Of their four children, two males were abnormal, one female and one male were normal.

⁷ W. D. McKim, *Heredity and Human Progress* (G. P. Putnam's Sons, 1900), p. 145. Reporting findings by Echeverria.

⁸ E. R. Downing, "Human Inheritance," in *The Nature of the World and Man* (University of Chicago Press, 1926), p. 435.

The normal male married a young woman whose ancestry was free of degenerative taint, but the progeny shows the persistency of the original taint. Figure 10 shows the same

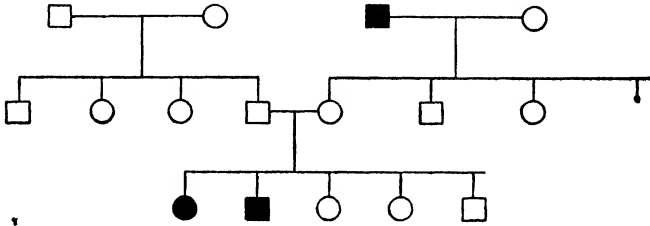


FIG. 10. PERSISTENCE OF A GENERATIVE STRAIN

tragedy in the marriage of two apparently normal individuals with degeneracy on the female side. Two of the children of these "normal" people were doomed to a life of helpless idiocy or imbecility. The genealogy of the Spanish royal line is

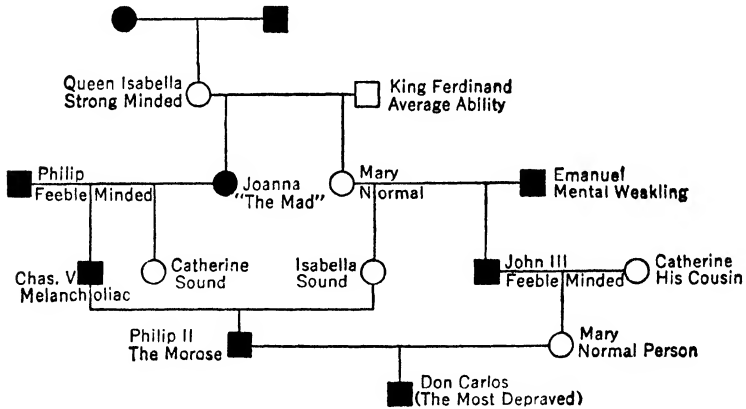


FIG 11. THE SPANISH ROYAL LINE

typical of the evidence presented by eugenics to support its grim interpretation of the law of inheritance.

Eugenists point a persistent finger to the United States Government reports which reveal the fact that feeble-minded-

ness has increased twice as fast as the population during the last generation. During the same period, insanity has increased fourfold.⁹ To offset these alarming figures, we may recall that our present methods of gathering data and diagnosing these conditions are so much better than the old, that the increase is probably more apparent than real. But the picture is not complete unless we recognize that in older and harsher civilizations, these types of low mentality and constitutional inferiority were largely eliminated; that present-day society makes special efforts to save these individuals; that the least desirable social strata are to-day more fecund than the more desirable strata. Clearly, society of the future will need broad shoulders to bear the burden we are preparing for it. Small wonder that the eugenists deem it imperative that some means be adopted to curb the increase of various dysgenic groups. Some urge segregation, others sterilization or laws forbidding the marriage of the feeble-minded, the epileptics, the insane, and those suffering from active venereal disease. There is no hope of helpful and constructive remedial measures, the eugenist propaganda teaches, until we agree that childbearing should be a privilege granted by society, not an inherent individual right based on animal nature. Motherhood is not always sacred nor is human conception always divine. Surely that motherhood which dooms its offspring to a life of dismal failure and constant despair is a curse. Only that parenthood is sacred which dedicates itself consciously and consistently to the creation of progeny healthy in body and mind.

The Position of the Geneticists.—The geneticist insists that to posit principles of human breeding as positively as the eugenists do, we need (1) data secured experimentally from large numbers representing many generations; (2) successful provision for an adequate number of control groups so that the experiments may trace a result to known heritable factors, here, an inherited trait; (3) a perfected experimental technique that will factor out, one by one, the influences of environmental forces that so frequently disguise or conceal in-

⁹ Downing, *ibid.*

herited traits; and finally (4) assurance that social prejudices or group attitudes have been permitted to exercise no influence in the interpretation of the findings. Granted, "Blood will tell," "Like begets like," and "Breed will out," who to-day has evidence that will withstand scientific scrutiny and will really justify us in predicting what blood will tell in a particular individual?

Eugenists have never really defined the terms "race" and "superior" in the statement of the objective, "To breed a superior race." The geneticist charges that race is often made to refer to a group of people living within certain geographic lines, hence to a political, social, or religious, rather than to an ethnic unit. Is superiority to be measured, he queries, in terms of one quality, or in terms of all qualities, and by the attainment of distinction? Too frequently distinction is achieved or lost through a fortuitous succession of circumstances in which environment more than heredity seems to play the controlling part.

Even the good work of Galton is not free from merited criticism. Typical of the many inquiries undertaken to challenge the technique and the data on which eugenists base their slogans, "Blood will tell" and "Like begets like," with respect to human breeding, is Raymond Pearl's¹⁰ evaluation of the parents and of the offspring of certain people of undisputed superiority. He decided to list as "eminent" only those whose achievements were recorded in at least one full page in the *Encyclopaedia Britannica*. Out of a total of 1,101 who met this rigorous standard, 588 were people who attained eminence through their personal qualities and not, like monarchs and statesmen, through accidents of birth or politics. From this class of 588, he selected only philosophers and poets because "there can be no question, I think, about their distinction resting almost wholly upon their sheer superiority over their fellowmen." Records could be found for only 48 fathers of the 63 philosophers. The progenitors of the world's greatest philosophers were mainly mediocre people; only three are

¹⁰ Raymond Pearl, "The Biology of Superiority," *The American Mercury*, Vol. 12, No. 47 (Nov., 1927), p. 264.

named in the *Encyclopedia Britannica*. Superiority was certainly not begotten by superiority. "Some of the parents would have been segregated or sterilized if the recommendations of present-day eugenical zealots had been in operation. And I estimate that a good half of these fathers would have been urged to curb their reproductive rate in the interests of the 'race.'" ¹¹ Of these 63 philosophers, 36 never married; 9 married but left no children; 2 had illegitimate children only; 11 had children who attained no distinction; only 5 had children of distinction; 3 of these 5 had children who were given biographical notices in the *Encyclopedia Britannica*. Of the 85 poets, only 3 had fathers who were sufficiently distinguished to be included in the encyclopedia. The children of the poets constitute as mediocre a lot as the progeny of the philosophers. Again blood didn't tell.

The present status of genetics warrants the statement that certain human traits, such as blue eyes, are inherited by the same laws that obtain in plants and lower animals. More complex human characters are probably heritable by the same mechanism. As the number of genes approach infinity, who can predict what the character of the next child will be? The problem becomes even more complicated because in humans we find sets of conditional reflexes, habits, and attitudes developed through environmental experiences and constantly called into play in the successful adjustments to a man-made world. No one can foretell, with any degree of certainty, within the startlingly wide range of inherited possibilities and perhaps equally wide range of environmental changes, what the exact nature of the offspring will be. To be sure, the studies of the inheritance of insanity cannot be dismissed lightly for they make strong presumptive evidence. But even if we grant the findings *in toto*, how can we translate them to-day, with safety, into legislative sanction for enforced sterility? The utmost caution must be exercised in making positive assertions concerning the appearance of social or antisocial habits in unborn offspring.

¹¹ *Ibid.*

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QUESTIONS FOR DISCUSSION

1. What is the difference between heredity and the old theological doctrine of predeterminism?

2. Summarize the contribution to evolutionary theory by (a) Lamarck; (b) Darwin; (c) Weismann; (d) Morgan.

3. Distinguish between heredity and environment as the factors that determine human development.

4. Make a study of twins. Point out their similarities and their differences. Make a similar study of brothers and sisters, not twins, but of ages that show no greater disparity than two years. Are the individual similarities and differences between twins greater than between nontwins?

5. What is the meaning of *chromosome* and *gene*? Can chromosomes be seen under the microscope? Genes cannot, yet the geneticist refers to them as if they were not ultramicroscopic. What is the justification for the assumption of the gene?

6. What are the Mendelian principles of inheritance? What is their significance to social progress?

7. Account biologically for the following:

(a) Offspring resemble parents

(b) Offspring and parent are never exactly alike

(c) Despite a common parenthood and similar environments, people may vary in almost an infinite number of ways

8. What difficulties present themselves in tracing the inheritance of traits other than purely physical ones? Give illustrations.

9. List the practical values of the facts of inheritance to (a) the teacher; (b) the physician; (c) the charity worker and the case worker for social betterment agencies.

10. What is the social significance of the answer to the question: are acquired characters transmitted?

11. What evidence is presented to prove the inheritance of acquired characters? Evaluate this evidence.

12. Which statement is correct?

The modern biologist believes that the Lamarckian idea of inheritance of acquired characters is:

(a) Beyond the range of possibility

(b) Not beyond the range of possibility but unproved

(c) Proved and should be generally accepted

CHAPTER XVIII

INSTINCTIVE BEHAVIOR

The Hierarchy of Human Action.—We are familiar with such actions as blinking, the knee jerk, swallowing, and the like. They are *reflexes*, the physiological adjustments organized prenatally so that we may be ready, at birth, to begin the business of living.

Closely associated with these reflexes are *instinctive* actions. The newborn babe will push away your offending fingers if you press its nostrils together. Jar its bed or pretend to drop it and you cannot fail to note its expression of the fear reactions. The older child is curious about his surroundings, follows sounds, colors, and lights. Animals show these instinctive forms of behavior more clearly: think of the migration of birds, the organized life of the bee or the ant, the beavers building their dam, the squirrel hoarding his food; each obeys a set of impulses that protects life and promotes well-being.

The *conditioned* reflex belongs to a higher order of action. It is acquired and takes place when a particular condition occurs to set it off. To illustrate: a child may dislike to be put to bed; it does not want to give up the waking day with all its pleasantness. On one occasion, it is put to bed not feeling well. Before many minutes it vomits, and naturally the mother enters and expresses concern. Then follows the changing of sheets and nightclothes. The parents are sympathetic and solicitous. All this is legitimate activity, but the sleeping time is postponed for an appreciable interval. If the child's indisposition does not pass away the next day, the evening may bring a repetition of the vomiting and all the attention that followed it. The third night finds the child

fully recovered but going to bed is still as undesirable as ever. The "good-night" and the shutting of the door are signals. The nervous system has learned its lesson. It produces muscular spasms, vomiting ensues and not only is bed-time delayed, but the intervening half hour is pleasant for it is filled with expressions of parental concern and endearment. Vomiting in many children is a conditional reflex, conditioned by such experiences as being censured, being forced to play by one's self, the sound of a shutting door—any circumstance that is unpleasant and to the child's mind holds possibility of change. Similarly the joy the child of six months expresses at the sight of food is due to conditioned reflexes. The sounds of the kitchen activities preceding the warming of the bottle, and the presence of the mother who brings the bottle are associated with all the pleasant sensations of food consumption. After a week or two of this routine, the sound of the pot being put on the stove is enough to cause the child to reach out its hands and to begin sucking and to show in other ways its desire for food.

Conditioned reflexes are commonly observed in the classroom. A child may show obvious dread of an examination, despite the fact that he is adequately prepared for it, because of the vivid memory of the disagreeable consequences of a past failure. A boy who lacked ability in athletics was invariably beset by temporary indispositions when his turn came to participate in the game. A student who has had a narrow escape while learning to swim may exhibit great reluctance, for many years, every time he is ordered into the school pool even though his physical training instructor assures him that he need not venture beyond the shallow limits.

Habits rank higher than the preceding forms of activity. They are acquired after regular repetition and are set off by a definite stimulus. Each of us always holds his pen in the same way and shapes his letters the same way. Spelling and the recognition of familiar number combinations like $7 \times 9 = 63$ are also the results of habit. The conditioned reflex is a crude form of habit. In both the reaction takes

place with little or no conscious direction and with practically no intervention of the higher nerve centers.

Reflective conduct is the highest form of human action; here behavior is preceded by deliberate weighing of alternatives and consequences. Action is conscious and purposeful, and may either continue to a foreseen end or may be inhibited at will. The sixth-grade pupil, when asked for the product of 12×9 says, from force of habit, 108, but he reflects before offering an answer to such a question as, "Which decimal has greater value, .091 or .0198? .005 or .500?"

Instincts Defined.—The meaning of instinct will become clearer if we contrast it with some of the other forms of activity we have just illustrated. We may achieve our end more effectively by a tabular arrangement which sets off distinctive characteristics in sharp contrast. (See page 368.)

Conclusion.—All these forms of activity are reflexive in nature if not actually reflexes. The reflex arc is the basis of all our native and acquired reactions and is, hence, the means by which all successful learning takes place. Theoretically, the conditioned reflex can be differentiated from reflex, on the one hand, and from habit on the other. But in any practical situation, the distinguishing characteristics become tenuous and even doubtful. For this reason, writers in psychology and education group reflexes and instincts into one group and call them *original nature, unlearned tendencies, native reactions, inherent drives*, or by any other name that conveys the same basic idea. They also employ such terms as, *the reflexives, the impulses, fixed behavior patterns* for all the four forms of action we analyzed in our table under the headings of *reflex, instinct, conditioned reflex, and habit*.

Classes of Instincts.—Innumerable systems of classifying instincts have been evolved. Some prefer the old logical groupings like: *individual vs. social instincts* in which fighting and mating are contrasted, or *physical vs. mental* instincts of which grasping and rivalry are illustrations. Most writers prefer a more functional classification and either accept Thorndike's or evolve a modification of their own.

CHARACTERISTICS OF INSTINCTS

	NATIVE REACTIONS		ACQUIRED REACTIONS
	<i>Reflex</i>	<i>Instinct</i>	<i>Conditioned Reflex and Habit</i>
<i>Origin</i>	In the inherited neural patterns of action	In the inherited neural patterns of action—"a compound reflex"	In the acquired neural patterns of action—a system of reflexes
<i>Definition</i> . . .	"A combination of congenital responses unfolded serially under appropriate stimulation" ¹	"An inherited pattern response, the component elements of which are movements principally of the striped muscles" ¹ "Purposive psycho-physical disposition" ² "Irreducible innate persistent tendencies" ³	An acquired pattern of response which is set off by a specific stimulus with absolute minimum intervention of consciousness. The conditional reflex is a vestigial habit
<i>Kinds</i>	Physiologic in nature	Involves psychic as well as physiologic response	May be physical as well as mental
<i>Localization</i> .	Very definite	General, for whole organism seems to be involved	Cannot be localized with reference to the specific parts of the nervous system involved
<i>Modification</i> .	Cannot be changed	Yields to training, but with reluctance	Can be modified with comparative ease if subject cooperates

¹ J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (J. B. Lippincott Co., 1919), p. 233.

² William McDougall, *Social Psychology* (John Luce & Co., 1908), p. 30.

³ M. K. Thomson, *Springs of Human Action* (D. Appleton & Co., 1927), p. 71.

Thorndike distinguishes three groups of instincts: ⁴

1. Those related to food-getting and self-preservation. He lists under this head the following: eating, hunting, collecting or hoarding, grasping, avoidance movements, migration, domesticity, fears, fighting, and anger.

2. Those related to "tendencies to respond to the behavior of others." Here he includes, among others, motherly behavior, attending to others, trying to master an activity, submission, display, shyness, secretiveness, rivalry, coöperation, envy, sex activities, jealousy, ownership, kindness, teasing, and imitation.

3. Those related to bodily movements and cerebral activities. In this group Thorndike offers vocalization, visual exploring, play, curiosity, manipulation, and the like.

McDougall,⁵ Warren,⁶ Gates⁷ and others offer their own lists which, in the main, are subject to the criticisms which we may direct very effectively at the Thorndike list. What conclusive evidence have we that teasing, hunting, and hoarding are really inborn reactions? To prove them acquired reactions is a much simpler task than to establish the fact that they are native in character. Note also how much repetition we find in the list; there is endless duplication in shyness and secretiveness and in collecting and ownership. Such terms as play, submission, hunting, and fighting are in sore need of definition before further discussion can be carried on with profit. The weaknesses in such a generally accepted list give strength to the position of certain behaviorists who deny instincts in the sense in which we defined them.

Characteristics of Instincts.—*They Are Unreflective.*—Our whole discussion is posited on the idea that an instinct is a complex of reflexes; that it is a spontaneous reaction that flows, according to a given pattern, without the intervention of consciousness.

⁴ E. L. Thorndike, *Educational Psychology* (Teachers College, Columbia University, 1913), Vol. I, pp. 50-109; 137-145.

⁵ William McDougall, *Introduction to Social Psychology* (John W. Luce Co., 1923), Ch. iii.

⁶ H. C. Warren, *Elements of Human Psychology* (Houghton Mifflin Co., 1922), p. 238.

⁷ A. I. Gates, *Elementary Psychology* (The Macmillan Co., 1925), p. 127.

They Are Not Individual, but Characteristic of an Entire Species.—Instincts are universal. All members of a species react in the same instinctive way. At a given age, normal children are expected to show the same instinctive reactions. An accurate knowledge of instincts is, hence, part of the necessary equipment of parent and teacher. Knowing the instinctive expressions of one child, we can, with reasonable assurance, prepare for the control of instinctive impulses of other children.

They Show Persistence but No Forethought of a Useful End.—A blink is almost a momentary response. So are all reflexes. But instincts persist for many minutes and create an attitude that may become constant. Gregariousness in human beings continues to prompt a fairly consistent line of action that may be observed throughout a lifetime. Despite the fact that instincts may give better control of the environment, they are, nevertheless, free from conscious forethought of the usefulness of their purpose. A country dog living in plenty continues to bury bones; certain birds will sit on substituted eggs made of china, guarding them with maternal zeal; certain fears persist even though we know that they are groundless.

They Seem Biologically Useful.—In our highly socialized life, instincts may come into sharp conflict with man-made law, but in primitive society, many original impulses made survival more certain. Animals seem to know instinctively what to eat and what to leave alone. Similarly, the impulse to appropriate, though morally bad, made life more secure for those most successful in taking and retaining what they had pilfered. So, too, those who asserted themselves and expressed their pugnacity effectively, found life less uncertain. Thorndike's primary group of instincts includes those that tend towards self-preservation. Many humorous tales are told to illustrate this basic impulse of the organism to make certain its own existence. There comes to mind the woman who was bent on drowning herself. She began wading into the water, but was made to come back to dry land by the man who pointed a gun at her and threatened to shoot unless she obeyed.

But we must not read too much man-conceived purpose into the current of life. At times nature seems to operate more by chance and less by logic. Exceptions to the seeming law that instincts are biologically good are not few. The moth seeking the flame does itself no service. Similar tropisms lead many to the grave. When one thinks of the vast mortality of living things one cannot escape the conclusion that nature may be profligate.

They Have Nascent Periods.—An instinctive impulse may not be equally potent in every stage of an individual's life. Pugnacity and play seem to weaken with advancing years. Sex expressions, such as concern over personal appearance or extreme self-consciousness in the presence of the opposite sex, may not manifest themselves until puberty. The very child who in his prepubescence worried his parents by carelessness in matters of dress, cleanliness, and condition of hair, now irritates them by his excessive attention to details of clothing and style of hairdressing. "Transitoriness of instincts" was a phrase much used in older writings to refer to the fact that not all instincts run parallel to lifetime—some seem to appear suddenly while others seem to disappear unless they have opportunity for expression. James taught that instincts had not only periods of nascence but also periods of senescence and death. But this belief is vigorously denied by most students.

Instinctive Tendencies Seldom Escape Modification.—Those who have combated the expression of instinctive tendencies bear witness to their stubborn hold. Nevertheless, we must recognize that instincts are constantly modified by human experience and thought. The infant brushing away the fingers that press its nostrils together, repeats this act upon succeeding provocations, not alone through instinctive promptings, but in terms of the experiences it has had. It uses more or less strength or speed, depending upon the intensity and the duration of the annoyance. The "brushing away act" is now instinctive rather than an instinct.

With the advance of years, reason develops and sheds light on what was, heretofore, a blind impulse. One learns that pugnacity, appropriation, too much self-assertion may bring

displeasure, rather than comfort, in an organized society. The thought processes now link themselves to what was an original impulse and thus enhance its benefit to the individual. Without the aid of reason, the reward of curiosity would be but meager, attention would be directed to the insignificant, and our craving for locomotion would satisfy itself in aimless wandering.

Observations on Certain Forms of Behavior Regarded as Instincts.—*Sucking* is easily stimulated and is often seen a few minutes after birth. The hand or parts of the garment are introduced into the mouth and sucking ensues.

Grasping is seen in almost all normal children. A small stick will be grasped as it touches the hand of the infant, and the clutch will continue even if the experimenter tries to lift the child off the bed by raising the stick horizontally. An infant two weeks old may in this way be able to support its own weight.

Defense Movements are quite marked. Pinch an infant a week old, and at once its free leg or hand will try to kick off the annoyance. The defense actions are more marked when the nostrils are pressed together and may be accompanied by unmistakable anger reflexes.

Avoiding Tendencies and Movements are rarely seen in infants. Before the acquisition of the eye-hand coördination, they try to grasp anything that stimulates them, especially objects in motion. But a few experiences that produce excessive stimulation, like loud noises, arouse avoiding or brushing away movements.

Visual Following may be seen in children one day old. They will follow a light or a brightly colored hat on the head of the person who leans over the bed.

Migratory Activities are probably developed by conditions distinctly environmental rather than hereditary. Not all children are nomadic; some are distinctly domestic in their cravings. The nomadic desire may be ascribed to unfavorable home conditions, family habits, sex curiosity, and desire to escape from an irksome routine like that of school.

Maternal Behavior is always explained as an innate pas-

sionate craving to fondle, to nurse, and to care for young, especially one's own. How shall we account for the many women who either are indifferent to children or dislike them so much that they develop various psychoses to avoid child bearing? Society has so long idolized motherhood that none dares challenge it and, therefore, the woman who is unwilling to bear children is likely to develop an imaginary ailment as a defense for this unwillingness. Frequently she professes a passionate fondness for children as a cloak to shield her from social disapproval.

Handedness has aroused the interests of many competent students. The infant learning to reach for objects seems to employ the one hand as frequently as the other but more than 90 per cent of adults are right-handed. Anatomically, the difference between the two hands is negligible. Recording the movements of infants between five and twelve months old as they slash through the air gives no evidence of preference for either hand. Right-handedness becomes evident when custom begins to operate, when adults insist that the child reach for objects with his right hand, feed himself with his right hand, greet others with the right hand, and hold pencil or brush with the right hand. It seems reasonable to conclude that right-handedness is conditioned early in life by social custom. Despite these facts, gathered experimentally,⁸ many neurologists of wide clinical experience insist that handedness is congenital and that forcing a left-handed child to become right-handed may produce nervous ailments and even stammering. We can point to no reliable data proving these undesirable consequences of forced right-handedness. The nervous ailments and the variety of tics which the neurologist sees in his clinic may be the results of injudicious parental correction through incessant nagging and faultfinding whether it be in matters of left-handedness, carelessness in school work, or in table behavior.

Are Instincts Innate Impulses?—Inquiry in the field of research has brought little that is conclusive but much that

⁸ J. B. Watson, *Behaviorism* (People's Institute Publishing Co., N. Y., 1925), pp. 99-102.

challenges many of the fatuous conceits of the past. Some deny that instincts are inherited patterns, others are just as positive in their support of the opposite view.

Reasons for Denying that Instincts Are Inherited.—The behaviorist, and mechanist in psychology, points to the boom-erang and argues: if the instrument be shaped and thrown correctly, it must return. Similarly, we are so constituted, bio-chemically, that we must react to given situations in certain specific ways. No other mode of response is possible unless we become materially different. Hence, why concoct the concept, instinct—an utter superfluity in both psychology and biology. Both camps admit that there seem to be imperative forms of unlearned behavior; the one calls them instincts, the others refuse to accept the term.

Upon analysis, one must grant that some instincts seem to be little more than conditional reflexes. Watson denies that the smiling by an infant is an instinct.⁹ “It begins at birth—aroused by intraorganic stimulation and contact. Quickly it becomes conditioned, the sight of the mother calls it out, the vocal stimuli, finally pictures, then words and then life situations, either viewed, told, or read about.” But, say the proponents, the smile in the infant one day old is an inevitable reaction to certain stimulations because, to use Watson’s language, the human is “so built and of such materials.”¹⁰ They continue: whenever we act in a certain way because we are “so built and of such materials,” we exhibit instinctive behavior.

The more orthodox treatment of instinct, we saw in an earlier connection, was not free from loose thinking. Its lists of instincts showed much overlapping and little genetic study, and included many reactions that were undoubtedly conditioned by our social inheritance, that is, by the customs and standards of the community into which we are born. Society has found certain forms of behavior, like talking and walking so advantageous, argues Watson, that it imposes these upon the child, very often, before it is physically ready

⁹ Watson, *op. cit.*, pp. 84-85.

¹⁰ *Ibid.*

to make the necessary coördinations. While this is true, Watson fails to explain, on grounds other than innate behavior, the urge which the infant, barely a year old, feels to undertake some form of locomotion like creeping, followed by the urge to try to support itself on its feet. Instinct is an historical term, often heavily encumbered by the opinions and philosophies of speculative writers. We look to the biologist of a near day to sharpen and fix the meaning of the concept, instinct.

Reasons to Support the Theory of Instincts.—Certain patterns of activity seem to be inborn, because they are continuous. The bird continues hour after hour in its nest building; the old hen continues to scratch, to seek worms, and to carry them to her young. Instances without number can be cited of apparently unlearned conduct that is more than a momentary reaction to a specific stimulus. In a reflex, an act seems to be set off by a stimulus; in these instances the reaction shows adaptation to the stimulus. Hunger, a body craving, is the stimulus. Introducing first the thumb, then the sleeve, and weeks later, a piece of toast into the mouth are modifications of the stimulus.

Instinctive forms of behavior reveal uniformity as well as continuity. All beavers build dams, all birds make nests,¹¹ all hens sit on their eggs, all infants brush away the hand that restrains their leg movement and clutch a suitable rod with amazing strength. Is it not reasonable to assume that since nerve connections are formed prenatally as the fetus develops, patterns for certain coördinated movements may be inherited?

The behaviorist admits the reign of instinct in animal life. Mating, home building, and modes of locomotion seem in-

¹¹ Some argue that nest building is learned from the environment. Some birds build their nests in chimneys but that species of birds is older than the chimney. Where the nests would be built if these birds were transplanted to an environment that is without chimneys, we cannot say. We may argue that nest building is a natural urge, a stimulus, that building nests only in chimneys is the adaptation of the stimulus, learned in the environment. No final conclusion seems possible; conjecture reigns.

herited reactions in animals. Experiments show that birds confined for a time after birth so that they could neither fly nor observe others flying, nevertheless flew at once upon being released;¹² that kittens without any opportunity to acquire the process of mouse hunting, will nevertheless show the familiar mouse reactions.¹³ The inference may be permitted that human beings, like animals, have inherited patterns of action.

We may challenge with success James's assertion that human beings have more instincts than animals; we may agree with Watson that much that seems instinctive is the result of conditioning; but there is, nevertheless, a residue of forms of behavior that can be explained in no other way than by transmission through the germ plasm. The complex acts of an adult who explores his environment visually, who exhibits curiosity, who imitates, or who handles what he sees, are undoubtedly altered by his environment and his intelligence. But the first of each of these reactions was probably induced by an inborn impulse.

In the remainder of our study, *we shall use instinct as a generic term including those potent impulses to action and those imperative forms of activity, which initially were probably inherited but which have since become modified and enriched by experience.*

Popular Explanation of the Origin of Instincts.—The student must be warned against accepting some of the current but unfounded theories concerning the origin of instincts. Herbert Spencer explains that the child clutches the stick or tries to grasp the pencil with its toes because these were useful reactions in an earlier mode of living. For the same reason, arms are extended as if clutching at the air, during a fall. Instinctive reactions reproduce those activities found useful in prehistoric ages. When we lived in trees, proficiency in toe holding and hand grasping insured survival. For similar

¹² D. A. Spalding, "Instinct and Acquisition," *Nature*, October, 1875. Cited by Gates.

¹³ Yerkes and Bloomfield, "Do Kittens Instinctively Kill Mice," *Psychological Bulletin*, 1910, p. 253.

reasons we fear darkness to-day, the story runs. Jack London, in his story, *Before Adam*, observes that in all dreams of falling, the dreamer awakens or his dream changes before striking solid earth. This he explains by pointing out that our tree dwelling ancestors fell asleep on upper branches, out of reach of preying animals, and invariably checked their downward flight. Those who did not, never became our ancestors; hence we inherited only interrupted falling mental patterns. Logical but fanciful. The best clutchers survived by the process of natural selection. But we have yet to prove that fear of darkness or clutching the air during a fall are innate and not conditioned by the environment.

Another explanation is that an instinct represents an act found useful in ancestral life, made habitual, and then handed down to succeeding generations. What was first an intelligently conceived act became automatic and then intelligence simply lapsed. Those who offer this explanation, fail to recognize that unless the transmission of acquired characters is proved, their theory has no foundation. Still others regard instincts as God-given and take refuge in the infinite wisdom behind the purpose of Providence. The truth is, that even if we regard instincts as inherited nervous patterns of action, we do not know their origin.

How to Modify Instinctive Tendencies.—While animal life may be guided and controlled by instinct, man, possessing the gift of reason, clearly may exercise more active direction of his destinies. The potent instinctive impulses must be modified and, if possible, undermined if they violate the standards generally accepted by society. This, teachers and parents may attempt in one of many ways.

1. The *method of disuse* is based on the belief that if an impulse is persistently thwarted and therefore unexpressed, it will become weakened. Disuse brings atrophy of muscle and loss of skill; disuse may obliterate an instinctive tendency.

In disuse, we try to prevent the occurrence of those circumstances that call forth the objectionable impulse. If the child is given to thumbsucking in sleep, put a cardboard sleeve on the arm so that it cannot be bent at the elbow. After

a week or two, the child may be weaned of this practice. If left-handedness is congenital, then offer things to the right hand; prescribe penmanship positions that make right-hand writing more comfortable; assign that bench in the manual-training room which makes left-hand work almost impossible.

The child who establishes his dominance over the family cat or dog by torturing the animal, should be given only toy animals. If he gives way to the impulse to steal, then he must never be left unwatched when there are things to take or nothing must be left about, that he can take, when he is alone. Teachers would do well to discontinue the practice of entrusting to monitors, the keys to the supply chests. To some children, a pad, a new ruler, and a new nickel-plated compass are among the coveted possessions. They take these things as freely as circumstances permit. Similarly, a watch or a purse should not be left on the desk or in an open drawer. When the teacher is called from the room, these objects become means of stirring up the very impulses we hope to weaken. Monitors who help in the distribution of materials should be given a counted number of objects. After distribution, the teacher should, unobtrusively, check up the number left in the box. Teachers, not children, should have free access to storerooms and supply closets.

The weaknesses of the method of disuse are at least two-fold. To begin with, we have no assurance that merely denying an impulse opportunity to express itself will effectively weaken it. Disuse atrophies muscle but it may not obliterate a potent tendency to action. And, second, all initiative must be taken by an agent other than the subject. There is neither self-denial nor positive self-training.

2. *Punishment* is another means of curbing instinctive tendencies but its value is limited. When punishment is inevitable and the child is afraid of discomfort or pain, there is hope in this method. The child who bites his nails, should have the finger tips painted with quinine or aloin. The moment the nail touches the mouth, punishment is swift and inexorable. But such artificial punishments as writing, "I

must not talk" 500 times may produce an attitude of resentment which is more undesirable than the impulse to talk to one's neighbor at the wrong time.

3. The *method of catharsis* advises that the child be permitted to express the impulse in question until it has entirely spent itself. The hope of those who urge this mode of dealing with children is that with increasing motivation, the child will come to an understanding of the undesirability of his conduct. The overassertive child, who will not play the game unless his desires are fully respected, continues his attempted domination until he realizes that his unsocial conduct has lost him his friends.

We note that after a test in arithmetic children are more prone to communicate than at other times. If they regard the occasion seriously, they write their results on bits of paper and eagerly grasp the opportunity to compare their answers with their neighbors. As soon as the teacher's back is turned, they whisper. They are scolded roundly but they repeat the offense at the first opportunity. Under such circumstances, the test should be followed by a setting-up exercise and this, by a three-minute whispering period. The impulse to communicate with neighbors surreptitiously will be placed under control of the children, for in providing them with opportunities to talk things over openly, the desire to whisper at inappropriate times is much weakened.

The method of catharsis is not devoid of all value when applied occasionally and cautiously with older adolescents but its promiscuous use is fraught with danger, for continued use may develop a habit that will be difficult to break.

4. The most effective methods of controlling instinctive impulses retain the original drives but substitute a more worthy for a decidedly less worthy end. These methods are known as *substitution and guidance*, *sublimation*, or *changed response*. While these terms, theoretically, do not refer to identical practices, they cannot in actual application be kept apart. Granting that not the impulse but the objective is good or bad, we see the wisdom of these methods. Let us turn to a few practical applications of them.

It is as useless to punish the child who is quick-tempered as it is futile to follow the method of disuse by preventing the occurrence of circumstances likely to arouse his displeasure. Let such a child's anger be aroused by a mean act. A show of temper is now a virtue. After this legitimate expression of anger, reason with the child and make clear the difference between justifiable and uncalled-for anger. Little by little, the child begins to exercise inhibitions when anger is about to rise and a measure of self-control may reasonably be expected.

The collecting impulse is strong in some children. The contents of boys' pockets show a range from small toys to hardware. Tom Sawyer's included a dead mouse. Observers in children's reading rooms will frequently find young magazine readers scanning the advertisements for the names of firms that send rulers, notebooks, samples of patent medicines, and what not. This desire for things, strong in most of us, is utilized to great profit by teachers who direct the collection of suitable materials for class exhibits in botany, geography, agriculture, or industry. Invaluable illustrative aids in geography and history may be obtained from folders issued by steamship lines and railroads, and children will take delight in writing for them and be thrilled at receiving them.

The bullying child is a source of trouble in every class. But when a bigger and stronger child is taking mean advantage of a younger and weaker classmate, he should be urged to become the champion of the oppressed. Here is an occasion which calls for a legitimate expression of his pugnacity. If the child does not see the difference between his previous bullying and the present fight for the right, it should be pointed out with care. Repeated experiences of this nature have their remedial effect.

Conclusion.—We are, to a great extent, the product of instinctive demands. They determine, therefore, the aims and practices in education. Stock phrases concerning instincts are as numerous as they are futile. "Give instincts free rein, follow where instincts lead," the disciples of Rousseau advise, forgetful that in the society of our day, there is often sharp

conflict between original nature and the socialized nature of man. "Curb all instinctive cravings," is the contrary advice given by those who fail to see that human nature cannot be eliminated in the education of the human. An instinct—a drive—is in itself neither good nor bad; it is essentially non-moral. The direction which an instinct takes and the end that it seeks to achieve make it moral or immoral, social or antisocial. The task of the guardians of youth is, therefore, to implant, not new impulses, but new objectives for existing impulses. Our whole educational process must have its roots deep in natural cravings; only as it works with them will it elicit the best responses of the pupil and make him an active participant in his own education.

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QUESTIONS FOR DISCUSSION

1. Give original illustrations of reflective conduct; habit, conditioned reflex; instinct; reflex.

2. Prove, by illustrations, that reflexes, instincts, conditioned reflexes, and habits can be set off sharply, one from the other, only in theory, but that in actual practice differences among these types of activity become tenuous and nice classification is almost impossible.

3. Which of the following are due to reflexes, to conditioned reflexes, or to instincts:

- (a) Inability to learn to swim because of fear of water
- (b) Inability to keep from blinking when a hand is moved quickly and threateningly before the face
- (c) Brushing away a sticky substance that adheres to the skin
- (d) Swallowing
- (e) Anxiety and feeling of slight nausea at the approach of a school test
- (f) Rapid flow of saliva at sight of a lemon
- (g) Following a moving light by an infant ten days old

4. Are the following statements borne out by fact? Explain fully.

- (a) "He has an instinct for business."
- (b) "Not until an interfering relative told my boy of six that a

vicious monster would get him in the dark, did he show fear of darkness. No child is afraid of darkness until that emotion becomes associated with a disagreeable sight."

(c) "I have an instinctive fear of snakes."

(d) "Man is highest in the animal scale and must therefore have the greatest number of instincts."

(e) "He practiced his music until it became an instinct with him."

(f) "I am instinctively opposed to capital punishment."

5. What is the most potent native tendency in man as well as in animal? Give evidence.

6. Analyze three people whom you know well. Set forth the strongest motives that direct the life of each of them.

7. Which seems the most reasonable to you? Give reasons. Instincts are of greatest service to us (a) in the first three years; (b) between the ages of three and twelve; (c) during puberty; (d) in early pubescence; (e) in postpubescence.

8. Defend or oppose the following: "There is an inherent race antagonism in man."

9. How would you proceed to determine whether the following are instinctive reactions in humans: swimming; chasing a cat; drawing objects, especially of nature; self-adornment.

10. How would you plan an extended inquiry into the old question, "Is handedness acquired or native?"

11. What does Watson mean by the assertion, "The number of instincts and the capacity to form habits are always in inverse ratio"? Illustrate. Can this statement be proved? Why? How?

12. Complete this statement and give ample illustration: "After the first few years we have no pure instincts; they have become modified by _____."

13. Enumerate ways in which a knowledge of the characteristics of instincts can aid a teacher (a) in disciplining and (b) in teaching pupils.

14. Give original illustrations of the methods suggested for modifying instinctive impulses.

CHAPTER XIX

EDUCATION THROUGH IMITATION

Is Imitation an Instinct?—The time-honored idea that we are innately imitative is challenged by many contemporary students of educational psychology who hold that we tend to act, to think, and to feel as those about us are acting, thinking, and feeling because our environment has taught us that only by doing so will we readily win social approval. No analysis yet made warrants a final conclusion concerning the inheritance of the fundamental impulse to imitate. Whether imitation is inherent or acquired is not as important as understanding the causes of its prevalence and potency.

Its Probable Psychological Origin.—Every idea, charged with interests or emotions, tends to express itself in action; consciousness craves to become motor. Feelings of joy or sorrow show themselves in the facial muscles, in the rate of respiration, and in the acceleration or retardation of the digestive processes. Fear causes similar but more marked bodily changes. If a new thought comes to us, we must tell it to some one; the greater the importance of the new idea, the greater the impulse to communicate it. Does the music or the actor's art please us, then we must applaud and let others know. Who has not experienced the gnawing craving of a secret for expression?

If consciousness is impelled to flow out in action, it follows that as we become aware of the ideas and feelings of others, we naturally seek to express them. Merely by giving way to this natural impulse do we become imitative. What happens when we hear a respected English scholar pronounce a familiar word in a way new to us? At once our lips tend to assume the form necessary to reproduce the new pronunciation. If those about us smile, we relax every facial muscle, even though we perceive no particular reason for mirth. If fellow passengers become alarmed at the sudden halt of

the train, we share their concern and we, too, crane our necks and nervously make inquiries of the guard. Slowly, but ostentatiously, the teacher assumes the correct sitting posture; without a word from her, the slouching pupils change their position. Our psychological mechanism seems to insure these modes of imitative response.

Its Probable Physiological Origin.—In an earlier analysis, we noted two basic properties of living nerve tissue, irritability or excitability and contractability. When a sense organ is stimulated, nerve tissue is excited, energy is set off, and motor reaction takes place. Because the reaction bears a sensible relation to the stimulation, our physiological organization seems to intensify our imitativeness.

Significance of these Observations Concerning Origin.—We see the vital importance of the environment as an educative agent. Determining as our inheritance may be, it must share with the total surroundings of an individual the responsibility for his development. Since each of us is part of the environment of others, each of us is truly his neighbor's keeper. The ideas we express and the attitudes we exhibit become the patterns, unconsciously to be sure, which others imitate. We cannot escape our social responsibility of playing a significant part in shaping the lives of our fellow-men.

Characteristics of Imitation.—*Conscious and Unconscious Imitation.*—Frequently we offer the pupils a model for their faithful reproduction. By this method of direct or conscious imitation, we teach spelling, the pronunciation of words like *cough* and *drought*, arrangement of addends in arithmetic, approved forms of letters, correct posture in penmanship, and many hygienic habits.

We may trace a marked change in our attitude towards art, religion, vocations, people, or ambitions, to the keen and subtle effect of a personal friend or a teacher. No one was aware of influencing or being influenced, yet changes occurred. Here we have illustrations of unconscious imitation, the results of which are deeper in their significance than those which follow conscious imitation. Parents or teachers who promote friendship among children in the hope that better self-control,

or greater thoughtfulness, or correct speech will result from this contact are relying on the effectiveness of unconscious imitation.

Imitation Not Indiscriminate.—Kirkpatrick defines imitation¹ as the “tendency to repeat what has been perceived in others of the same species.” We may go so far as to say that unless we regard a person as at least our equal, we inhibit, very successfully, the impulse to imitate. The teacher, who argues that the influence of the “bad boy” refutes this statement successfully, overlooks the fact that many of her “good” pupils regard with admiration the impertinence or the audacity of their troublesome classmate. But the moment their attitude towards misconduct becomes changed, they will not be influenced by the problem child. A street gang imitated its leader out of respect as well as fear; but when he suggested tripping the blind peddler and stealing his wares, most of his followers deserted. Such action jarred their sense of right and, though they feared their leader’s wrath, they defied him.

Imitiveness and Intelligence.—We must deny most emphatically the lay assertion that imitiveness is closely but inversely related to intelligence. Classroom observation gives ample illustrations to refute this popular fallacy. Superior children are accurate in carrying out routine directions. They rule papers in the prescribed form and copy with gratifying success the models of speech and behavior set before them. Inferior children cannot be relied on to imitate a given form. We may conclude that “the more imitative individual is more educable” because he has greater opportunity to acquire quickly and directly the necessary routine of life.

THE FUNCTION OF IMITATION IN EDUCATION

Imitation serves a threefold function in education. Its consequences, therefore, make it a potent factor in the life of an individual.

¹ E. A. Kirkpatrick, *Fundamentals of Child Study* (The Macmillan Co., 1903), Ch. viii.

1. **Imitation as a Socializing Factor.**—Through direct imitation, the child acquires the language, the customs, the likes, the dislikes, the details of dressing and eating, the standards of right and wrong—the business of living in a complex society. Imitation is, therefore, the process by which the individual becomes assimilated in his group. It simplifies and quickens his adjustments to environment. So consistently and so rapidly does each individual acquire social standards that before his pubescence, he has almost completely identified himself with his community.

But we must not assume that the impulse to imitate is less pervading in adult life than in youth. In history we recognize epochs or periods in which events show certain common tendencies initiated and directed by human beings. Each age has its distinctive attitude towards life, its peculiar values, its discrete moral and religious standards. Each age expresses its own *Zeitgeist*. Each age brings its own superstitions and its own craze. In the Middle Ages the common drive was towards the Holy Land. Had we lived then we, too, might have joined the legions that went forth on a mission whose purpose was ill-defined in the minds of the most intelligent. Had we lived in early New England we, too, might have “seen” witches and had the blood of the innocent on our hands. Those who have lived through a period of war have seen common aspirations, loyalties, and hatreds spread like prairie fire. How madly do we proclaim the hero! But we are likely to snatch the crown from him just as dramatically as we bestowed it. We think in crowds and we act in hordes. “Most people,” says Sidis, “are in a constant state of semihypnosis.”

Review the development of literature, of painting, of music, of any art, and at once we note the “schools”—the Romantic, the Religious, the Naturalists, the Formalists, the Impressionists. No one commands the painter to adopt a particular technique, but first one, then a few, then a host refuse to draw human figures with regard to their anatomic structure. “Life is all blotches of color,” becomes their slogan, and blotches of color they all see and they all paint. He who

is not impressionistic in a period of impressionism is laughed out of the galleries. In truth, we may say, "Art has developed by slowly accumulating imitative accretions." Art history affords ample illustrations of this principle.

Industrial depressions usually have their origin in conditions more psychological than economic. First a feeling of overconfidence seems to pervade the land. Something happens to shake the faith of people in one section of the country. A few grow cautious. Caution spreads. Business men all over the country draw in their reins. How frequently does one hear the business leaders—reputed calm and calculating—saying, in a period of prosperity, "A reaction is about due." There seems to be no economic reason for this reaction, but business men believe that a period of depression follows a period of happy activity. Their attitude spreads until the whole country is in the throes of hysteria.

Gabriel Tarde, in his remarkable treatise, *The Laws of Imitation*, explains all of civilization by imitation. Even the tools invented by man are merely copies of parts of our bodies. James calls imitation and invention, "the two legs on which the human race, historically speaking, has walked." "The boy or girl is a social monad," says Leibnitz, "a little world that reflects the whole system of influences coming to stir its sensibilities."

2. Imitation as an Intellectual Agent.—Most of the habits and facts taught by the school are acquired through imitation. School people are prone to deny this but an analysis of actual practice may bring conviction. The child develops habits of penmanship and of neatness in written work through imitating approved forms. In reading, drills on word-pictures and on phrase-pictures are designed to lead to recognition at sight. In spelling, the child imitates as faithfully as possible *once, two cents, one cent*, until he spells these words correctly from force of habit. We may be very objective and appeal to the pupils' activities in our early lessons in arithmetic, but the vast majority of the children learn such facts as the following by persistent repetition and imitation of the approved patterns:

$$6 \times 9 = 54$$

$$7 \times 7 = 42 \text{ Ans. } 6$$

$$8 + 7 = 17 \text{ Ans. } 9$$

$$4 \text{ qt.} = 1 \text{ gallon}$$

$$3 \text{ ft.} = 1 \text{ yard}$$

$$36 \text{ in.} = 1 \text{ yard}$$

The reader may continue with profit to make this kind of analysis for the other subjects in the curriculum. The conclusion is inevitable. The skills and the facts that make up the bulk of the contribution of the average good school are acquired through simple and very direct imitation. We are not drawing up an indictment, but making an observation.

True, says the school man, all normative facts, like $6 \times 9 = 54$, cannot undergo change, hence their mastery is a simple matter of learning that you may designate as learning by imitation. But, he insists, the illustrations have all been taken, so far, from the formal and the elementary experiences of the classroom; if an analysis were made of content subjects and more advanced studies rich in social significance, imitation would probably play a minor part in both teaching and learning. Let us see.

How does the child learn to reason in geography? We hear pupils say, "Spain has a large wool export. Central Spain is a large plateau, suitable for grazing but not for agriculture; many sheep are pastured there, hence she has much wool." Extremely logical. But most children who tell this little story about Spain have never seen a plateau, and if they had, they could not, out of their limited experience, come to these economic conclusions. The whole chain of reason is a bit of adult thinking that has been acquired by those children who imitate us. So long as our pupils understand what we teachers have thought out for them, we seem to be satisfied.

An example in a recently published arithmetic drill book says, "What shall I mark goods so that I can allow the usual trade discount of $14\frac{2}{7}$ per cent and still be assured of a selling price of not less than \$6.60." The pupil explained:

\$6.60 is $\frac{6}{7}$ of the marked price;

$\frac{1}{7}$ of the marked price is $\frac{1}{6}$ of \$6.60 or \$1.10;

$\frac{7}{7}$, the whole marked price, is $\$1.10 \times 7$, or \$7.70

The supervisor, pleased with the demonstration, concluded, "This teacher knows how to make pupils think." But whose thinking are the children doing? Certainly, not their own; not even their teacher's, for both pupils and teacher are repeating the thinking of the mathematically minded persons who perceived these relationships and formulated them so simply.

How does the most proficient pupil do his thinking in grammar? Does he discover relations for himself or does he perceive the relationships he has been taught to recognize by fairly stereotyped modes of thought?

What kind of thinking does the college student do in his mathematics? He is asked to demonstrate the validity of an equation. He multiplies each side by x , cancels, substitutes b for y , cancels again, makes a second substitution—behold, the elements on both sides of the sign of equality are identical. With great relief, he indites his *Q.E.D.* But, again, is not this mathematical demonstration, or a similar one, in his textbook? Is he not imitating the methods of the professional mathematician? How much of this nice logical sequence is his? If he had had no model, what would he have done with the equation whose validity he was asked to challenge? Small wonder that so many students, who do not understand the implications in these equations, look upon their college mathematics as a form of "low cunning."

Contemporary education does more than give the child fixed modes of thinking. It imposes standards of æsthetic appreciation and of loyalty. In the arts, the child is frequently told what to like and what to reject. History in the elementary-school curriculum should be a propaganda subject, boldly declares a report of school superintendents. Facts are not to be taught merely as facts, but rather as steps leading to approved conclusions which must be forced upon immature and trusting pupils. What we see, they must see; what we condemn, they must condemn; what we exalt, they must exalt.

Hence it is clear that we must not permit ourselves to think lightly of the rôle that imitation plays in the education of youth.

The Legitimate Use of Imitation.—There are teaching situations in which imitation is the most effective method. In written composition, a well-selected model will do much to stir appropriate ideas, to teach correct language forms and to increase vocabulary. In oral language drills, we select a form that we seek to habituate and then by dint of repetitions develop an auditory sensitivity for the correct expression. After the lessons on “It is *I*,” children are apt to say, in their overeagerness to be correct, “He gave it to him and *I*”; “He saw him and *I*.” The teacher plans a story “*My Lucky Day*” and asks the children to supply the proper word. This they can do easily, at this stage of progress, as can be seen from the following, in which italicized words are contributed by the pupils:

This is my lucky day. As I came into the school building, my principal saw *me*. He came up to *me* and said that he wanted to congratulate *me*. When I said that I knew of no reason for congratulation, he told *me* that the superintendent was coming this afternoon to award *me* the medal for good citizenship.

The teacher now suggests that the day’s luck should be shared with others. She formulates each succeeding sentence and requires the class to supply the words indicated in italics.

- (a) This was my lucky day.
- (b) In each case my luck was shared with others.
- (c) In the gymnasium, the instructor sent Walter and *me* into the game. Each of us scored for our team.
- (d) In the English class, the teacher praised John, Emily, and *me* for our compositions.
- (e) The dime found on the way home was divided between James and *me*.
- (f) When mother returned that afternoon, she brought delightful story books for my sister and *me*.

Other stories are told in which the form, *you and me* or *her and me*, must be used. This is repeated until the teacher

has evidence that the children have developed an auditory preference for the expressions, *He and I went*, and, *they called him and me*. No amount of drill in formal grammar will be as fruitful of results with young pupils as this persistent invitation to imitate approved forms of language.

Imitation should be an important factor in oral reading. Teachers do not read aloud often enough to their pupils. They call upon children who are hesitant readers, or who have foreign accent, or who have speech impediments of various kinds, or, who lack ability to get the thought from the text. The class is treated to a variety of speech errors and to endless mispronunciations, as the text is cruelly mutilated by inexperienced readers. Even if the teacher were to correct every error in an oral reading lesson, there would still be no assurance that the right sound would be remembered rather than the wrong one. Before calling on a poor reader or a child whose speech is not free from slight dialect error, the teacher should read the selection and thus offer a model of speech for direct and immediate imitation. Children whose speech is decidedly foreign or who have marked speech defects should read to the teacher privately and not to the class. Selections whose meaning calls for unusual skill in voice modulation, and ability to set a tempo appropriate to the thought, should always be read by the teacher first. What is gained by calling on a child who, with the best intentions, misinterprets the author and does violence to his stanza or his paragraph? In too many classes, children hear the wrong before the teacher offers the right.

In corrections of speech defects, and in the eradication of common mispronunciations, imitation rather than logic should control. Let us assume that the substitution of *d* for voiced *th* is quite common among the children. Those whose speech is free from this error should be excused from all drill in correct utterance of *th* as in *these, them* and *that*. To the others, the teacher should make a vigorous auditory appeal by reading, with emphasized correctness, lists of *th* words and sentences containing *th* words until the air is fairly vibrant with the correct sound of *th*. After a number of repetitions,

the majority of these children will produce *th* correctly merely by having become aware of it and then imitating their teacher. Only the few who fail to respond to these repeated auditory appeals should be taught position, that is, the mode of producing the sound in question. Speech should, wherever possible, be an unconscious product. Only teachers and physicians need know how it is produced. To teach position to all children makes speech conscious and creates a new set of difficulties for some of them. Just as soon as we think of how to walk or swim or dance, inhibitions set in which halt movement and make the activity slow, awkward, and less skillful. It is difficult to understand why so many primary teachers find it necessary, in teaching phonetics, to explain the production of each sound to all children and to require each pupil to study position of teeth, tongue, and lips in individual mirrors.

Dangers of Overimitation.—Teaching that makes excessive use of imitation is invariably a dull round of drills. We must realize the rational limits of imitation. Having taught a type of problem in arithmetic or a type of sentence in English, we must give applications that vary the type. If the children can find what per cent one number is of another, we must not rest when they can obtain answers to problems like the following:

A boy who sells magazines made an average weekly profit of \$4.20 the first half year. The second half year, he increased his profits by \$.60 a week. What was the per cent of increase?

A local hospital must raise \$30,000 and it succeeded in securing \$12,000. What per cent of the necessary amount was secured?

Let the pupils try variations of the type in which the same principle is followed, thus:

A hospital raised \$12,000, but it needs \$30,000. What per cent remains to be raised?

A hospital raised \$12,000. Thirteen thousand dollars must still be raised, what per cent was raised?

A boy whose weekly profit was \$4.20 brought it up, by hard work, to \$5.40 a week. What was his per cent of increase?

Here is the real test of comprehension. No longer can the correct answer be obtained by making the smaller number the numerator and the larger the denominator. Type problems are very helpful when the process of analysis is new or when mastery of a fundamental principle is sought. But the extended use of the type saps virility from problem work in all subjects.

Nor is it necessary to require uniform modes of solution and execution of problems in any school subject. There are many roads to Rome and no one way should be prescribed. Some children are unnecessarily retarded by the requirement that all numbers be labeled or that every partial answer be checked before beginning the next step in the solution.

Important as imitation may be in oral reading, we must not permit ourselves to read to children merely to give them a model of correct expression. To invite a child to "read what I just read to you" develops affectation and gives no assurance that the pupil can convey a thought when it occurs in a similar construction. The teacher's rendition should be subjected to critical analysis: what was stressed? what slurred? where was the tempo changed? where was the voice raised despite the period?—these and similar questions help the class to read meaning into the teacher's performance. Similarly, in dramatic coaching, or in rehearsing pupils for recitations in assembly, no teacher should invite slavish imitation of his mode of delivery and of his gestures. Ask children to give in their own words the thought of the author and then ask them to state the same thought in the author's words retaining their own mode of delivery. In matters of gesture, the same procedure is suggested. Let the child do what he would do in a similar situation. His gesture may lack some of the technical requirements prescribed by elocutionists but it is natural and hence more effective for that particular speaker. What is gained from the stilted recitations and the artificial, though correct, gestures and expressions that characterize so many assembly recitations?

Imitation and Self-Evaluation.—Imitation acquaints the individual with his own powers. In the recognition of the *alter*,

there is an equally vivid recognition of the *ego*. In imitating a mode of speech, a form of salutation, a method of resolving a problem, a suitable design, or a simple melody, there are revealed to us our personal abilities, weaknesses, versatilities, or limitations. Unless we know ourselves we live either in a fool's paradise, believing ourselves capable of what is hopelessly beyond us, or in a state of chronic inferiority, afraid to undertake what we can do reasonably well.

3. Imitation as a Character Agent.—*Moral Standards Acquired through Imitation.*—Our first standards of right and wrong, imposed upon us by our guardians, are usually crystallized into very definite formulæ of conduct. From our earliest days we are taught to imitate those socially approved patterns of behavior.

The school intensifies this appeal to imitation. It emphasizes biographical study as a means of character development. In the lives of others, the child finds concrete expressions of the virtues we extol and the traits we condemn: Hiawatha is the apotheosis of physical courage; Evangeline, of devotion to an ideal; Brutus, of loyalty to state; Cassius, of selfishness and of the cunning born of jealousy. It is the hope of the school that these personages of history and literature will so grip the imagination of the child that they will become models in accordance with which youth will pattern its own life, negatively or positively.

The influence of companionship is potent, we saw, because unconscious imitation functions continuously. Few teachers influence conduct as vitally and as directly as the esteemed leader of the class. Teachers, however well liked, present so many differences of age, interests, and achievements, that their standards are regarded, by their pupils, as unattainable ideals. In the community of the school, as in adult society, public opinion is shaped by the recognized leaders. It is what they believe, not what the teacher espouses, that determines the character of conduct. Despite careful distinction between "tattling" and reporting an offender who jeopardizes the safety of his classmates by scattering matches on stairways, children persist in condemning "telling on a wrongdoer"; young

people are prone to "the taking of revenge," and to regard cheating at examinations as a pardonable sin. Correct the attitude of the recognized and admired leaders on these ethical questions and each child will adopt new patterns of conduct.

The revealed moral standard is society's standard which we are asked to copy. But with increasing maturity, each individual should develop his personal code of right and wrong in which reason rather than imitation should rule because, in the last analysis, social standards represent the minimum moral demand of the community.

Imitation and Initiative.—It has been urged that through imitation one develops both originality and initiative. This seeming paradox is explained by the fact that imitation is always selective and never exact.

At any moment we may have countless models of conduct to imitate, but we neglect most of them and follow only a very few. Place ten suitable designs for a book cover on the blackboard and give the class freedom of choice. Each design will probably find favor in somebody's eyes, but the pupils will show wide range in their selection. No imitation is an exact reproduction. Each imitator expresses his individual taste in the process of imitation. What child does exactly as he is told? Details, unimportant to one, are very significant to another. Here we have an explanation of some forms of apparent disobedience. Teachers of large classes may find it necessary to require uniform arrangement of papers. They tell the class exactly how to arrange papers for daily work in arithmetic. Despite the most explicit directions, not a few will change the prescribed form. In searching for the cause, we lay it at the door of inattention. While this may be true, the usual cause lies in the interpretation or misinterpretation of directions. Each child's personality colors the instructions; each detail is modified by individual conceptions of attractiveness and convenience; the result is a personal reaction rather than an impersonal copy. We are familiar with the experiment in which the same story was handed down through five individuals who knew the object of the test. Yet, how different was the story told by the

fifth person despite the conscious effort of the four to render an exact reproduction. Each individual simply told his story in terms of himself, and gave emphasis and color to each incident of the story in terms of his personal past experience and his habitual attitudes.

Although these incidents are true, we can hardly agree with Horne, who argues, "Imitation is the mere schoolmaster that brings us to originality." Because of limited time and energy and of definite personal interests and needs, imitation is highly selective. Because at any one moment, our reactions to life are shaped by all that we are and by all that we have lived through, imitation cannot be an exact process. Neither condition proves that imitation develops originality and initiative. To hold that "imitation is the mere schoolmaster" of originality may introduce an injurious element in education, for then imitation may be used to sanction practices that mechanize, and methods of teaching that make severe and exclusive memory appeals.

Progressive Imitation.—When employed as a fundamental principle in teaching, imitation must be made progressive. As the pupil grows in power, imitation must gradually decrease and reason must play an ever-increasing rôle. Let us assume that a language model was presented in teaching children how to write a friendly letter. The teacher led the class to understand the importance of orderly sequence, the need of addressing oneself to the probable interests of the person to whom one is writing, and the charm of simple, unaffected style—writing as if one were talking to an intimate. The lesson in oral composition completed, the pupils must now imitate the model letter. Let us list the possibilities:

1. The letter might be copied verbatim, thus producing a transcription lesson.

2. The children might be asked to reproduce as much of the letter as they deemed necessary, feeling free at all times to consult the model.

3. The children might be asked to write a letter dealing with the same subject but without the opportunity of consulting the original.

4. The children might be asked to write a letter to a friend on

related or similar matters but not on the subject matter of the original.

5. The children might be asked to answer this letter.

Here we have five forms of imitation, beginning with the most slavish kind of copying and progressing until one is unencumbered by the original. In the earlier steps, the very form as well as the content must be reproduced; in the latter, only the principles that determine the effectiveness of an intimate letter must be applied in a content that is original. The whole process is progressive. Each of these stages offers correct classroom procedure. The teacher must decide which children are so deficient in written language as to require the first or second steps in imitation. The abler pupils may be assigned to work based on points four or five; the most gifted may be given even greater latitude. With the last, we may study two more letters and then assign a task that calls for the application of the underlying principles. Or, we may even ask these children to write their own letters first, then to study the model to ascertain ways in which their own products might be improved. Here imitation follows self-expression, whereas in the other stages imitation precedes it. Not the age, nor the grade of the pupils, but their proficiency in language and their capacity for growth will determine how slavish or how free the imitation of a model may be. In any one grade, the children should be grouped according to ability and should be required to follow that degree of imitation which is in keeping with their language capacity.

SUGGESTION AND IMITATION

Characteristics of Suggestion.—In its widest sense, suggestion is so closely related to imitation as to be identified with it. We enter a room filled with mourners and at once we feel grief-stricken. The change induced in us may be ascribed to either imitation or suggestion. In a more limited and technical sense, suggestion refers to the influence exerted upon another to act in a particular manner with a feeling that he himself initiated the specific mode of behavior. Suggestion

is, therefore, a potent stimulus setting off determining tendencies to action. It is a form of psychic contagion. As the slouching pupil recites, the teacher assumes a posture of exaggerated correctness; instantly the child begins to elevate his torso, his shoulders and his head. The hypochondriac feels sudden visceral disturbance and at once assumes an attitude of a suffering patient. The teacher whose voice is loud and raucous obtains answers from his pupils in loud and strained voices. A noisy teacher makes a noisy class. The stimulus in suggestion may come from without (external) or from within (autosuggestion).

Undesirable Manifestation in Class.—The stuttering child unintentionally demoralizes the speech of many of his classmates. The tics of a nervous pupil are imitated by many. An attitude towards life made interesting by one student may become general among a group of students. Periodically, luckily infrequently, a wave of hysteria spreads through a group. The last suicidal wave that spread through the American colleges claimed many victims before it abated. A person with a persistent cough in a theater sets the whole audience coughing. In a classroom with its continued relationship, the child with a stubborn cough does great harm; a dozen children may contract the coughing habit, all exhibiting, upon examination, a functional cough, that is, a cough due to muscle spasm but not to irritation or inflammation in the respiratory tract.

Treatment of Class Contagion Due to Suggestion.—Whenever feasible, the patient should be completely or partially isolated. The stuttering child may remain in the room but he is never called upon to read aloud or to recite a memory selection to his assembled classmates. He recites, in private, to the teacher.

Every means of distracting attention from the objectionable behavior should be used. Change of environment, occupational therapy, days unusually crowded with work may be provided, depending upon the condition. Parents and teachers who scold and punish and keep urging the child to exercise greater control, keep the condition, that should be

dimmed, in the very forefront of the child's mind. It is wise at times not to see the tie nor to hear the stammering.

In certain cases, occasional appeal to reason should be made. At times, punishment, sharp and immediate, may come as a shock and induce greater self-control. No rule can be formulated for the employment of one practice or another. Both are effective and both dangerous, depending upon the individual and the history of the behavior to be reduced.

Frequently, good-natured ridicule may do much to check class or group hysteria. A college humorous publication printed a list of directions to those students who contemplated suicide during the hysteria to which we referred. They were asked to leave the doors open because the college was just then without a mechanic and to pay up their debts before making their departure. Above all, they were asked to state their reasons for their suicidal acts. For their convenience, a list of possible causes was published; the prospective suicide was to check the reason that applied in his case. They were also urged to make suitable provision for the disposal of bodies, as it was inconvenient to have the corridors littered with them. All of which may not be a very high form of humor, but it achieved its purpose admirably.

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QUESTIONS FOR DISCUSSION

1. Give instances that tend to prove that imitation is an inborn impulse, hence an instinct in the strict sense of the term. Give instances that show that imitation may be conditioned by environmental factors.

2. Give classroom instances, other than those mentioned in the text, of conscious imitation. How may a teacher employ unconscious imitation?

3. Which of these statements are correct? Give reasons.

(a) The more imitative, the more educated we are

(b) Only children are imitative

(c) Children imitate the problem child whom they regard courageous

4. What does the child acquire through imitation that quickens his adjustment to his society?

5. "We think in crowds and go mad in hordes." What basis can you offer for such a conclusion?

6. Make a list of thinking situations that arise in the teaching of history, geography, and high-school mathematics. To what extent is the thinking original? To what extent imitative?

7. In a college class, a student explained, "The more gold in the country, the higher must the prices of all commodities be, because the greater the supply of gold, the less is the value of any unit of it; the less the value of a unit of it, the more units must we give for an article." Trace this line of reasoning. How much of it is original? Where did the student acquire it? What is his own contribution?

8. Give instances from geography, history, oral English, and arithmetic in which the acceptable methods of teaching are based on imitation.

9. "Teachers frequently impose upon their pupils their own prejudices, their personal likes and dislikes, their standards of right and wrong, and even their own religious slant on life." Cite instances from the teaching of literature, history, civics, and geography where this indictment may be true.

10. Give illustrations, other than those cited in the text, of the following:

- (a) proper uses of types in teaching
- (b) improper uses of types in teaching
- (c) repression of originality through overinsistence on uniformity.

11. What is the justification for the use of the language model in the teaching of composition? Is this an artificial method of teaching composition devised by the school and suitable for use only in schools? How did some of our masters of prose develop and refine their language ability? May the model be a means of repressing originality? How can we guard against this danger?

12. "History tells the story of lust, of destruction, of treachery, and of cowardice as well as of courage, sacrifice, and loyalty to ideals and institutions. History is, therefore, ill-adapted as a means of teaching ethical principles of conduct." Discuss the citation, giving (a) reasons that lead some to uphold the view here expressed; (b) the weaknesses of this position; (c) your own opinion.

13. Give instances in which following the revealed social standards, the community standards, would produce conduct not wrong, but nevertheless not altogether worthy of the best type of manhood.

14. "Through imitation one develops originality and initiative." Why is this view held by some? To what extent is it true?

15. Give an illustration of progressive imitation other than that offered in the text. Point out the progressive character of the imitation.

CHAPTER XX

THE EDUCATION OF THE EMOTIONS

Place of the Emotions in Education.—We live as we feel. Our emotions set off our behavior and give color to life. Emotions rather than ideas prompt the sacrifice of the martyr and the treachery of the scoundrel. The emotions which we develop determine, in the main, the friends we choose, the vocation we pursue, the recreation we follow, and the relationships we establish with family, church, and state.

Education has unfortunately concerned itself too much with intellectual attainments and too little with emotional responses. But without emotional development, life has only one color—a very drab one at best. Without emotional refinement, we are doomed to the sordid and the commonplace, for spiritual appeals remain meaningless and the arts fall upon eyes that see not and ears that hear not.

Basic Concepts Defined.—*Feelings* may be regarded as tones or attitudes which accompany consciousness. Every experience brings with it, in greater or less degree, a feeling of pleasure or displeasure, of comfort or annoyance, of indifference or of concern. *Organic sensations* are results of physiologic activities, and express themselves as pain, cold, warmth, thirst, hunger, nausea, and the like. But each organic sensation arouses a feeling of pleasure or displeasure; thus we are annoyed by extremes in temperature and pleased by moderate warmth or cold.

We may sharpen the differences between feelings and organic sensations by setting them forth in contrasting columns:

*Feelings**Organic Sensations*

1. They undergo change or even disappear if attention is directed to them. Analyze your feelings and they vanish, giving way to an intellectual state, accompanied by a different feeling tone.

2. They do not originate in an end organ; they serve as the color accompaniment of experiences that come through the senses.

3. They have no local existence. When aroused, all of the individual seems to be involved.

4. They may become very complex as well as intense.

1. They grow in intensity as we attend to them. Continued attention to one's pain makes it grow into an agony.

2. They have specific causes and can be traced to a definite source. They are specific reactions to organic or physiologic activity.

3. They can be localized, as a rule, with comparative ease.

4. They retain their simple character and distinct identity, but may become extremely intense.

Feelings may be classified as (a) *sensory*, that is, the tones or attitudes that accompany organic sensations such as hunger, cold, or the ache of a decaying tooth; (b) *intellectual*, those that are experienced at the recall of a person, or a particular event; (c) *social*, the tone of satisfaction or annoyance aroused by human relationship; and (d) *aesthetic*, the feelings stirred by beauty created by nature or man.

Feelings show a remarkable range of degree rather than of kind. From the point of view of effect upon the individual, we may group feelings into three classes: *pleasant* vs. *unpleasant*; *exciting* vs. *depressing*; *straining* vs. *relaxing*. Wundt, who gave us this tridimensional theory of feelings, sums up the physiological coefficient of feelings in the following table:

Pleasant feelings: pulse retarded and intensified

Unpleasant feelings: pulse accelerated and weakened

Exciting feelings: pulse strengthened

Depressing feelings: pulse weakened

Relief feelings: pulse accelerated and intensified

Aside from exhibiting the intimacy between psychic and physiological life, this theory gives us useful data for a better

comprehension of the cause of emotions to which we shall presently turn.

Emotions, on the other hand, are complexes of feelings and of instinctive urges, directed towards a definite objective. Emotions are always organic, accompanied by changes in glandular activity, respiration, digestion, and blood pressure. Feelings shade gradually from simple displeasure at pressure or unusual cold into complex emotions, or attitudes towards questions of personal honor or national loyalty.

Are emotions native or acquired responses? The old belief was that each of us has inherited patterns of love, fear, hatred, humôr, pathos, and sympathy. Watson¹ concludes, after an exhaustive study, that children not older than three years show: (a) no fear response except at loud noises and when support of their bodies is withdrawn; (b) rage or anger only when bodily movement is hampered; (c) love that has sexual association for it is aroused by patting, stroking, or gentle rocking. Hence he concludes that the primary emotions are fear, anger, and love (in the Freudian sense) and that these are probably inherited, but the less simple emotional reactions are acquired through experiences.

The Physical Basis of Emotional Life.—*The Autonomic Nervous System.*—For convenience of study, we may say that a human being has two nervous systems, the central nervous system, that is, the cerebro-spinal system and the autonomic nervous system. Concerning the anatomy and physiology of the former, much is known; of the latter, comparatively little. The central nervous system includes (1) the nerves that carry sensory stimulation from end organs to the spinal cord, (2) the spinal cord itself, (3) the cerebrum, and (4) the nerves that carry motor impulse to the striped muscles. The autonomic nervous system consists of nerves that carry impulses from the cord and brain stem to the heart, the vasomotor system, abdominal organs, and the glands. This is diagrammatically shown in the accompanying chart. The central nervous system controls in perception, thought, and

¹J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (J. B. Lippincott Co., 1919), Ch. vi.

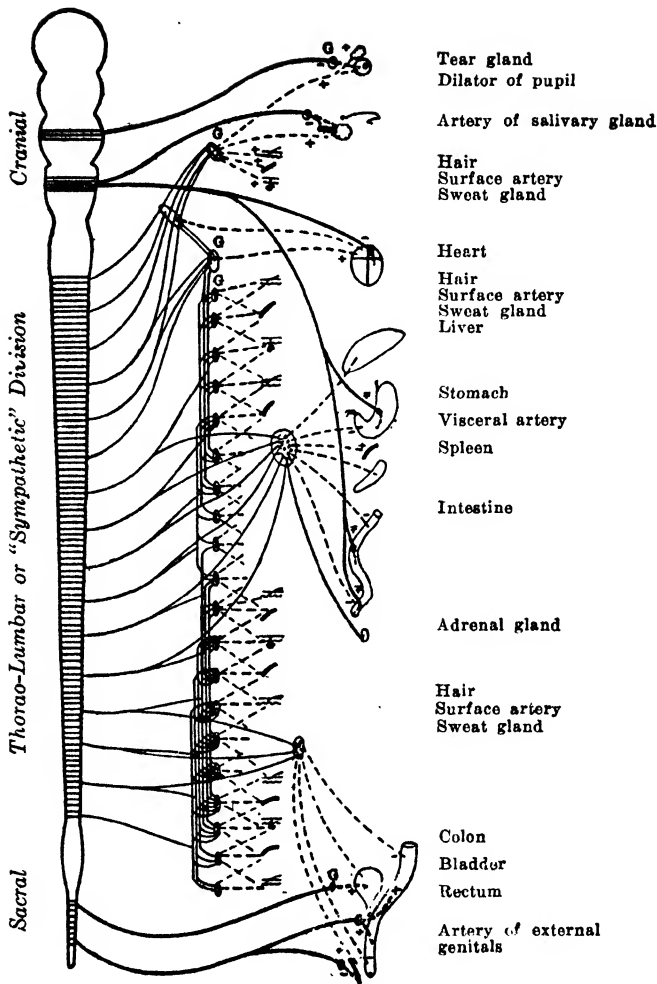


FIG. 12. DIAGRAM OF THE MORE IMPORTANT DISTRIBUTIONS OF THE AUTONOMIC NERVOUS SYSTEM

The brain and spinal cord are represented at the left. The nerves to skeletal muscles are not represented. The preganglionic fibers of the autonomic system are in solid lines, the postganglionic in dash-lines. The nerves of the cranial and sacral divisions are distinguished from those of the thoracico-lumbar or "sympathetic" division by broader lines. A + mark indicates an augmenting effect on the activity of the organ; a - mark, a depressive or inhibitory effect. For further description see text. (From W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage*, 2d edition, D. Appleton & Co., 1929.)

voluntary behavior. The autonomic nervous system regulates strictly physiological functions and exercises a modifying influence on emotional life. The patterns of behavior controlled by the autonomic system are believed to be inherited. Although it is related to the central nervous system, the autonomic system enjoys comparative independence. Only in intense mental states does it probably function in close and dependent relationship with the central nervous system.

The Autonomic System and the Endocrine Glands.—The body has two kinds of glands, duct and ductless. The former secrete their active agents, their chemicals, through well-known openings into very local parts of the body. The salivary glands, the gall, part of the pancreas, the lachrymal or tear glands are duct glands. Endocrine or ductless glands inject their active chemicals, hormones, into the blood stream and hence have significance that is decidedly more than local. These hormones secreted by the endocrine or ductless glands in minute quantities seem to control rate of growth, proportional growth, color, localization of fat, hairiness, body tone, voice, and the character of our emotional behavior. The ductless glands, about which most is known, are listed below with brief descriptive statements of the significance of each. The liver, pancreas, and sex glands may also be considered as endocrines.

To these endocrines we must add the group of secreting bodies known as the *Islands of Langerhans*, situated in the pancreas, and secreting a hormone known as *insulin* directly into the blood stream. The puberty glands or gonads also inject into the blood their hormone, which controls the development not only of the secondary sex characters like body hair and mature voice, but also the sex impulses.

The reader must, at all times, be cautious in making diagnoses in terms of the functions of the endocrine glands. Sometimes the symptoms produced by the malfunctioning of one gland simulate those created by another, or the hyperactivity of one gland may create reaction usually brought about by the insufficiency of another. Nor does each gland exercise its regulatory function independently of the others. No au-

TABULAR SUMMARY OF THE ENDOCRINE GLANDS

<i>The Ductless Gland</i>	<i>Location</i>	<i>Description</i>	<i>Function</i>	<i>Application of this Knowledge</i>
The thyroid, the best known and understood	Two masses on each side of the Adam's apple. Connected by an isthmus.	Vary in appearance; one mass or lobe may be smaller than the other or entirely dwarfed. Largest in prenatal stage, and larger in females than in males. Secretion or hormone, thyroxin, is more than 50 per cent iodine.	Insufficient thyroid secretion retards growth, produces relatively heavy features, and results in feeble-mindedness or idiocy known as cretinism. Overfunctioning of the thyroid increases (1) rate of heart action, (2) blood pressure, (3) irritability. Seen in persons suffering from exophthalmic goiter or Graves' disease.	Thyroid extract, fed to cretins, has produced, in certain cases, astounding results. They showed accelerated growth, quickening of mental functions and general improvement in health.
Parathyroid	Four small bodies near thyroid.	In size and shape like a pea, arranged two and two, on each side of the thyroid.	Little understood; they may have something to do with assimilation of lime. Doubt as to their endocrine function frequently expressed. Yet their removal is followed by loss of hair, nails, development of cataracts in eyes and death in two to fourteen days. When impaired, they produce extreme irritability verging on convulsions.	In present state of knowledge no useful application has been made.

<p>Thymus</p>	<p>Under upper part of the breast bone.</p>	<p>After puberty it degenerates into lymphatic tissue or fat.</p>	<p>Its degenerative changes are delayed by castration. When removed in young animals, general growth is retarded but sex development is quickened. The inference is that it functions to delay development of sex glands until the rest of the body is developed, that is, until puberty.</p>	<p>None in present state of reliable information.</p>
<p>The adrenals or suprarenals</p>	<p>Two bodies near upper part of kidneys.</p>	<p>In size and shape like a large bean. The loss of one may have no effect; of both, is fatal. Remarkably well supplied with blood.</p>	<p>Removal produces extreme apathy and labored respiration, weak heart action, and death. Adrenals are of greatest service in emergencies. They speed up heart action, withdraw blood from abdominal organs and drive it into large muscles, brain, and lungs. They withdraw sugar from the liver and send it to the bloodstream; hence they are a vital control of energy.</p>	<p>The hormone of the medulla part of the adrenals, <i>adrenin</i>, is the base of a drug that checks hemorrhages. "Adrenin wins battles and makes men brave; lack of it may make them cowards."²</p>
<p>The pituitary ...</p>	<p>Near base of brain, it hangs by a hollow stem.</p>	<p>Its size is that of a small lima bean.</p>	<p>The secretion of the anterior lobe influences growth and sexual development. Overfunctioning causes gigantism.</p>	<p>Pituitrin is used to quicken muscle contraction. It is valuable in certain conditions.</p>

² G. A. Dorsey. *Why We Behave Like Human Beings* (Harper & Bros., 1925), p. 215. To be taken figuratively rather than literally.

TABULAR SUMMARY OF THE ENDOCRINE GLANDS (*Continued*)

<i>The Ductless Gland</i>	<i>Location</i>	<i>Description</i>	<i>Function</i>	<i>Application of this Knowledge</i>
The pituitary <i>Continued</i>	and is partially encased in the sphenoid bone.	It is essential for normal behavior. It has two sections, known as the anterior and posterior lobes, each producing its own distinguishing hormone.	tion of this lobe produces gigantism. Pituirin, the active principle of the posterior lobe, has a marked effect on the striped muscles, causing violent contraction. Pituitary glands become enlarged after castration and during pregnancy when the ovaries take on a new function. During pregnancy, face and hands sometimes become enlarged, giving a semblance of temporary gigantism.	tions of childbirth but a wrong dose may, by the violent muscle action it sets up, cause rupture of the uterus.
Pineal	In the brain, near the base, but behind the pituitary.	Its size is that of a grain of wheat. It reaches its highest development in the seventh year and then undergoes degenerative changes and becomes connective tissue or "brain sand."	Its hormone has not yet been discovered. Its function, about which there is grave doubt, seems to be limited to pre-adolescence. It seems that its chief business is to enhance early physical growth and to postpone full sexual life until the period of puberty.	No direct application is possible at this stage of our knowledge. Tumors of the pineal gland are found in young people who show precocity in mental and sexual life, but these tumors invariably involve sections of the mid-brain, hence no accurate inference can be made.

thority knows the exact appearance of a normal thymus. Endocrinology is a new study, vital to the understanding of both our emotional life and of our physiological processes.

Conclusions of Endocrinology for the Teacher and Parents.—Development is conditioned by factors far removed from the central nervous system. Feeble-mindedness, excessive irritability, extreme apathy, and marked impulsiveness are not necessarily indications of a central nervous system that fails to respond to influences of environment. Nor does obesity, frailness, restlessness, or malnutrition lead to the inescapable conclusion that the child's diet, rest, and recreation are wrong. These forms of maldevelopment may be the result of deep-seated chemical interplay that is beyond the present meager knowledge of the most skillful pediatrician.

According to an old oriental tale, Chinamen accused of crime were given a mess of rice flour to eat. Those who masticated and swallowed their portions in reasonable time proved their innocence; those who could not, established their guilt by their failure. Despite its crudity, this device is not without some physiological sanction. The guilty, possessed by fear, inhibited the action of their salivary glands and soon found a caked mass that would not be downed. To what extent the problem child and the chronic delinquent are victims of endocrine insufficiency or excess, is a matter of speculation—interesting, to be sure, but still highly speculative. We must beware of repeating, on a large scale, the ancient Chinese practice we have just described.

Characteristics of Emotions.—1. *Physiological Accompaniment.*—Our discussion has brought us to the conclusion that all emotion is rich in bodily reaction. The death of a dear friend affects heart action and respiration, it moistens the eye, creates a lump in the throat and a disinclination for food; there can be no mistaking the deep sorrow that grips us. But without these bodily reactions, there is no sorrow. The professional charity worker who listens to a heart-rending story and says, "I am extremely sorry," without experiencing these bodily changes, means, "I can understand how one in your position would be miserable." His state of mind is in-

tellektual rather than emotional, for "a disembodied human emotion is sheer nonentity."

In anger, the adrenals quicken their function. The result is rapid heart beating and rapid respiration. To supply the increased amount of air, the nostrils are distended. Adrenal action induces the liver to discharge large quantities of sugar into the blood stream; the muscles, supplied with additional food, experience a new impulse to act; hence, the clenched fist and the threatening arm movements that accompany anger. But the excessive function of the adrenals may produce digestive disturbance in the organism. After anger has subsided, abdominal distress may follow. It seems, therefore, that we are more angry in body than in mind.

Emotions may retard action to the point of immobility or they may so quicken action that it becomes a flood of undirected movement, almost a convulsion. One may be speechless or voluble with anger; fear may bring on paralysis or it may precipitate violent action; love may induce self-consciousness with attending shyness and taciturnity or self-forgetfulness and exclusive concern with the object of one's emotion. As further evidence of the contrary nature of emotions, we must cite their tendency to lose their poignancy through repetition. The apparent unconcern of the surgeon to the suffering he sees daily, the seeming indifference of the charity investigator, and the calm of the minister listening to a sorrow-stricken member of his flock, are evidences of the dulling effect of repetition on many of the finer emotions. The ability to control emotional promptings and to estimate such situations intellectually may be a manifestation of strength. With weak people the repetition of such emotional experiences tends to produce a sensitivity bordering on nervous instability.

These bodily movements accompanying emotions are intimately related to the action of the endocrines. A popular theory ascribes their origin to ancestral reactions that insured survival in the struggle for existence. Spencer tells us, in astonishment, there is a raising of the eyebrows and wide opening of the eyes because our ancestors sought the greatest

possible visual aid in unexpected attacks. The mouth is usually opened on such occasions, because our forebears took a full breath before the attack. In anger, the nostrils are distended and the teeth gritted, Spencer continues; but the mouth is closed despite the need for greater breath, because the ancient "combatant's mouth was filled with part of his antagonist's body." It is difficult to deny these specific explanations of the origin of such of our actions as the clinching of fists and the shutting of the mouth in anger. While we cannot disprove Spencer's theory, we have no evidence for it. There is plausibility in his story but plausible inference has very frequently failed to square with fact.

The Contagion of Emotions.—A distinguishing characteristic of emotions is their capacity to communicate themselves from one person to another. Emotion begets similar emotion in others. A cheerful person brings sunshine into a room whose occupants are in a negative mood. An irritable teacher makes an irritable class; a dispirited teacher, a dejected class. Out of the whole-hearted enthusiasm of the teacher for his subject there springs general enthusiasm that affects every pupil. Because "emotions are caught not taught," the dispirited teacher can do little with most subjects and decidedly less with history, civics, ethics, literature, music, art, and nature study—the school subjects of æsthetic and spiritual significance. Animated teaching cannot be done while the teacher is enjoying the comforts of his chair.

Emotions May Be All Controlling.—An intellectual activity may be thwarted by an emotion. In anger, fear, or love, the mood rather than the rationale of the circumstance determines the line of volitional expression. The team entering the game with fear of the opponents has already lost; self-confidence and courage, screwed to the sticking point, are half the victory. Every failure, unless judiciously explained by parents or teachers, makes succeeding failure more likely. If the child is not led to see that his failure was caused by inattention or carelessness or lack of application or undue difficulty of the assignment, he may develop an attitude, slight to be sure, of personal inferiority. With each succeeding failure, this

sense of incompetence grows until it paralyzes all effort. Such school practices as "leaving children back," or segregating pupils in classes known among the children as the "slow group," or in any way stigmatizing the least competent are responsible for a great many of the behavior problems that confront parents and physicians.

Emotions Have Wide Range.—We noted that some psychologists hold that we have a large variety of inherited emotional patterns like jealousy, sympathy, sorrow, delight, reverence, and the like. Many clinical studies have been made on infants ranging in age from 150 to 200 days. They were exposed to cats, dogs, a pigeon in a paper bag, a pigeon flapping its wings, to darkness, to flame, and to other children. Setting aside as far as a human can his prepossessions and refraining from introspection, behaviorists reached the conclusion that we have three original or inherited emotional responses, fear, rage, and love, the last term employed in the Freudian sense. Sorrow is an acquired emotion, having in it a measure of fear and enriched by conditioned associations with environmental factors. Such emotions as shyness or shame are again acquired attitudes, imposed by social standards.³

Between these two extremes there is a third school that is concerned less with the genetic aspect of emotions and more with the functional. Emotions, they hold, vary in intensity from mere feeling to a consuming passion; they vary in duration from a momentary feeling to a persistent mood that gives color to all experiences. An emotion of fear may become a horror, shattering the nervous system, or, it may pale into a general, indefinite attitude of suspicion. These psychologists usually distinguish four classes of temperaments: (a) the choleric—strong in feeling, quick in thinking and acting; (b) sanguine—weak in feeling, quick in thinking and acting; (c) melancholic—strong in feeling, slow in thinking and acting; (d) phlegmatic—weak in feeling, slow in thinking and acting. In the final analysis, this classification is not

³J. B. Watson, *Psychology from the Standpoint of a Behaviorist*, Ch. vi.

satisfactory. It presents, not a complete and mutually exclusive set of categories, but rather a dramatic description of some common temperaments. It does point to the fact that the teacher who knows the pupils temperamentally has information useful in disciplining and teaching them, for she knows the nature of the appeal that may be made and the response that may reasonably be expected.

Emotion as a Complex of Attitudes.—From the above analysis, it is apparent that an emotion is no simple reaction to a situation. Its complex character is shaped by many factors. First, we transfer the emotion aroused by one experience to many other experiences without any rational justification. The child who is frightened by one dog, often exhibits fear of all dogs, cats, and even of all mechanical animals. A child frightened by a red-headed stranger, may exhibit a keen dislike for all red-headed people for many years, if not for his lifetime. In adult life, the father may transfer the love he bore his wife to his daughter or his son. Maternal love is now much more than the term usually connotes. The unmarried aunt may mother her nephew or niece or she may derive much satisfaction from the care of an animal; in either case, the attitude is extremely complex. An emotion may express itself differently in different people. The young man or woman may express the emotion of love by being lovesick, tender, sympathetic, embarrassed, ashamed, suspicious, envious, or jealous—all common manifestations of a basic emotion, each complicating the resulting attitude. Instincts, emotions, habits, and reason combine to form what appears essentially as an emotion—a highly complex state that defies resolution into its component mental elements.

Are All Emotions Desirable?—In Darwinian tenets, every form of native behavior is biologically good, for it represents survival in the process of natural selection. Anger and fear, like other emotional reactions, hence insure effective adjustment to life, the one by making the individual combative, the other, cautious. But this is an inference of Darwin's, not a fact. To-day, biologists give us long lists of evolutionary

changes that do not add to the adaptive capacity of the individual. Anger and fear have probably wrecked many a nervous system. We cannot always explain our native reactions; all we can assert, with any degree of assurance, is that we possess them or that they possess us.

Tests for Emotional Accompaniments.—Because emotional responses are so intimately associated with ideas, muscular movements, and physiological processes, physiologists and psychologists have found it possible to devise tests of the character and the intensity of an emotion which attaches itself to an experience. These tests have been used clinically by psychiatrists seeking cues to help them guide troubled and confused minds into orderly and balanced reactions towards life. Often the patients themselves either withhold information, or are honestly not fully or even remotely aware of the cause of their own neuroses.

In the *free association test* the patient is asked to tell at once "what comes to mind" at a word or phrase given by the examiner, and then to continue telling the successive ideas that come to him. Associations flow continuously, but at the mention of a certain word or circumstance by the patient, he exhibits marked hesitation or even inability to go on. The test is continued and careful note is made of the character of the ideas that produce blockage. These blockages may reveal the ideas to which the patient attaches particular or exaggerated significance and which are therefore overrich in emotional associations.

The *controlled association word test* consists of two lists, a neutral list and a significant list, the latter containing words that refer to ideas that center around the special anxiety of the patient. As in the preceding test, the observer mentions the word and the patient tells the first thought that comes to his mind. Let us assume that we are dealing with a person who is suspected of living in dread of disease or who seems to be mastered by a growing feeling of incompetence. Words referring to inferiority or to illness do not go into the neutral list but make up the significant list. The patient answers freely and readily when a word of the neutral

list is given. But with each significant word, there may be hesitation, or flushed face, or inane giggling, or needless repetition of the word, or retarded rate of response, or even complete inability to make any reply. If the examiner's suspicion is not unfounded and his list is carefully devised, this test may yield an interesting set of inferences based on the character of the responses to the significant word cues.

The Freudians⁴ have developed an elaborate technique of analyzing dreams and those slips of the tongue and lapses of memory which seem to us merely accidental. They have collected hundreds of incidents which show that the man who forgot where he placed the tickets had no stomach for the opera but usually went because of his insistent wife. When we make an appointment for an evening already promised to another, we may unconsciously express our preference for the second occasion and thus really want to forget the less desirable engagement. So, too, mislaying an arithmetic book or forgetting a French reader, is not accidental; these lapses may be explained by the pupil's dislike for these subjects. The man who asked, "Who saw my cigar bottle?" when he wanted his cigar box may have given unintentional evidence that he craved liquor more than nicotine. Emotions will out unless we are eternally watchful. The inferences may be unwarranted in these particular cases, but the incidents are cited to illustrate a method that frequently does help in ascertaining the nature of certain emotional accompaniments.

Other practitioners seek information of emotional controls by recording changes in heart action and in the vasomotor system, that occur in certain circumstances. As a rule, interpretations by this method are extremely difficult because changes in respiration are very rapid and numerous and are caused by too many factors to enable us to identify the effects of any one factor.

Some physiologists believe that the amount of sugar in the urine may be taken as an index of the emotional stress. They

⁴ See, for numerous illustrations, Sigmund Freud, *Psychopathology of Everyday Life* (The Macmillan Co., 1914).

explain that in acute emotionalism, the adrenals release large quantities of adrenin which, in turn, releases more of the sugar stored in the liver than the body can burn up. Glycosuria, that is, sugar in the urine, and sugar in the blood, are commonly found after a period of emotional strain. Again, we cite a test not because it is infallible or even highly reliable but rather to illustrate the far-reaching influence of emotions in physical as well as in mental life.

The Education of the Emotions.—*Introductory Considerations.*—Our main concern is with the practical phase of our problem: how can emotions be weakened, strengthened, or refined? Very frequently, we must shift emphasis from the objectives set by nature to those established by organized society. The task is difficult, and, though many forms of approach to emotional reactions are open to us, none of them can be followed in a specific instance. A very effective method of dealing with fear may be futile or even most unfortunate if employed to establish better control of sex emotions. Adjustment to individual cases is always imperative where emotions are involved. Throughout the following discussion we shall consider acquired as well as native emotional behavior.

1. *By the Method of Disuse.*—The most obvious method of weakening undesirable emotions is so to order the child's life that these find no occasion to express themselves. The child who is irritable should not be teased. No child should ever be frightened for disciplinary purposes, nor should the child given to violent anger be crossed needlessly. Pubescents who are likely to give way completely to sex emotions should not be left alone too frequently, nor permitted to lie in bed long after wakening. It does not follow, to be sure, that failure to gain expression, obliterates an emotion. Our procedure may only dim it and when a favorable condition arises, it may break out with surprising vigor.

Disuse is not synonymous with repression. The latter is rarely possible and often dangerous, especially in emotions bordering on the hysterical. It is usually advisable to permit the child to give full vent to weeping or giggling, for only in

this way will an acute emotionalism spend itself. In these cases, repression leads to intensification. In dealing with fear and anger, and their derived emotions, the method of disuse is usually effective.

2. *By the Method of Punishment.*—Psychologically, punishment is a desirable means of controlling behavior when the punishment follows as an inevitable sequence of the event. Then the pupil associates the undesirable consequence, the punishment, with his own behavior. He sees that no person is to blame for the disagreeable experience which follows as a natural effect of a cause which he himself set in motion. The child who pulls down the tablecloth and is hit by the falling platter or who, contrary to advice, grasps a paper of pins and is pricked in every part of his hand is being punished by suffering the natural consequences of his own conduct. But, in the routine of everyday living, the intimacy between action and result may be far removed. If we slap the child's hand, as Watson suggests, as it reaches out to open the gas cock, we may be doing what is wise under the circumstances, but the punishment is man-made, not natural. Asphyxiation either alone or with the rest of the family is the punishment of natural consequences. In intentional misbehavior, *punishment* may be effective. In undesirable emotional behavior, a method more constructive and in closer keeping with the nature of the child must be sought.

3. *By the Promotion of Health.*—Our study of the origin and the tests of emotional response led us into the consideration of many physiological processes far beyond the voluntary control of an individual. Irritability may have a deep-seated cause in eyestrain or malnutrition. Fear of pain or a morbid interest in physical well-being may often be traced to exaggerated parental concern with matters of hygienic living. The "sterilized infant" is likely to become one of those in the "lunatic fringe" who suspect every door knob and faucet of harboring colonies of deadly germs. To be sure, the health of the child should be safeguarded but threats of impending illness as a mode of insuring the child's coöperation in hygienic practices must be condemned most rigorously. As far as

circumstances or skill in the use of language permits, we should stress health, not ill health; we should promise strength, fleetness of foot, skill in the athletic activities of youth, and refrain from mentioning the possibilities of illness.

A wrong mode of living may intensify sex emotions. Sex life presents two interesting phases: *detumescence* and *contractation*. The former is essentially physiological and refers to the bodily sensations, muscle contractions, and glandular secretions that are part of sex activity. The latter is predominantly mental and consists of the romantic chain of ideas associated with sex life.⁵ In the first three or five years, the child experiences very satisfying sensations when "placed on the stomach," when stroked or patted or when permitted to suck thumb or pacifier. These make up the detumescence of this neutral period. The infant's love for those who feed and bathe it is its contractation. With the child whose age ranges from five to puberty, detumescence leads to finding the genitals, masturbation, exhibitionism and similar sex practices; contractation shows itself in strong attachment for certain persons and animals, in desire to be kissed and fondled, and occasionally in mistreating the ones loved or in a desire to be mistreated by them. The constructive program for guiding the development of sex emotions was set forth at length in an earlier discussion of sex education.

4. *By the Method of Guidance and Sublimation.*—A constructive method of dealing with coarser emotions that is the antithesis of repression, regards the impulse back of an emotion as essentially desirable, but the objective decidedly bad. More desirable goals must be substituted for less desirable ones. According to the *method of substitution and guidance*, vanity is not always to be condemned. The child who is vain about his friends, his school or his home but never vain about himself has transformed an ugly attitude into a lovable one, loyalty. Those lost in self-concern may be misdirecting

⁵ Mary T. Whitley in *The Child, His Nature and His Needs*, edited by M. V. O'Shea (The Children's Foundation, Valparaiso, Ind., 1924), Ch. ii.

a very humane impulse, pity. When they direct it towards helpless human beings and suffering animals, they may, in accordance with the poet's promise, become the ones whom God loves best.

After an impulse is redirected to more social ends, that is, after it has been sublimated, the differences between the right and the wrong goal should always be pointed out with utmost care. The young pupil should not be left to discover for himself the superiority of his new goal. Without this appeal to reason, the method of guidance lacks potency.

On occasions, it may be necessary to thwart the impulse in an emotion by conditioning it upon new and satisfying experiences. If the emotion of fear has become associated with darkness, then the child is encouraged to think of the starry sky that can best be seen during dark night and to recall the cool comfort that the dark night brings in the hot summer. To offset the fear that the newcomer usually has for school and its strangers, plans are made for an excessively cordial reception on the first day. Now the strangers become associated with kindness and school with play and playmates.

Modification of Emotions through New Experiences.—Since emotions are not disembodied attitudes but rather tone accompaniments intimately associated with chains of ideas, it follows that as new interests are developed through new experiences, old emotions must be modified and refined. Through curriculum and controlled environment, we hope to give the growing pupil this enriched contact with life.

1. *The Curriculum and Emotional Refinement.*—The school must include in its curriculum those experiences that cultivate desirable emotions and, little by little, eliminate the vulgar. Curriculum material in literature must stress content, melody of words, rhythm, character, plot, and ethical implications—in a word, the æsthetic and the interpretative, rather than the formal, aspects of the writer's art. Literature teaching that directs attention to vocabulary drill, figures of speech, identification of names, and critical scrutiny of paragraph unity, is devoting itself to cold technique. Emotions spring into full blossom in the warmth of human backgrounds and

relationships. Music lessons that emphasize song rather than musical notation and that give the child repeated opportunities to hear the masterpieces of the great composers, refine æsthetic sensibilities and arouse a set of emotions that crave for satisfaction in leisure hours. Such music teaching makes life richer by giving new meaning to the world of sound. Art teaching that worries the child with problems in graphic expression and the technical requirements of perspective and design, forgets the beauty of line and color. A considerable part of the art course should be given to a study of good reproductions of the best in sculpture, painting, and architecture. As the children live with these pictures, they learn to recognize them, to understand their significance, and to respond to their emotional appeal. Again, life is richer because we have read new meaning into its forms and colors. Nature study lessons should be decidedly more than factual, more than simplified and emasculated biology. They must create an appreciative attitude towards all living things. Unless our nature study leads the child to see the beauty of nature and to express humane attitudes towards helpless creatures, it fails to achieve very vital objectives. Once more, we have enriched life by reading meaning into nature's forms and activities.

These æsthetic subjects must not and cannot be taught without a basis of fact and a reasonable measure of attention to form and technique. Our protest is against that over-formalized teaching which fails to recognize the full spiritual significance of the æsthetic elements in the curriculum.

The social studies are rich in possibilities for emotional refinements. A real understanding of certain biographies, of the great dramatic incidents, and of the underlying forces of history develops human sympathies that run deep. At times, we should encourage the child to impersonate the characters of the past and thus relive a life rich in the very emotions and attitudes we are trying to develop. "Imagine yourself a soldier at Valley Forge," says the teacher, "and then tell the hardships you are suffering." The class suggests, "lack of food, ragged and insufficient clothing, the bitter cold, the

lack of suitable shelter, the discouraging military situation, the call of home, the hopelessness of the outlook." The teacher continues, "Now, in all truth, would you have stayed on or left for home as many others did?" Study the faces that give evidence of minds busy coming to a conclusion in so critical a matter. Of course, almost everybody gives assurance of undying loyalty to the cause but even though many of these young people are exaggerating their fidelity, their mental experience in reliving the lives of the patriotic band of Valley Forge, leaves them with a richer stock of highly social emotions.

The factual side of our social studies is frequently permitted to kill all that is human in a situation. In a history lesson, the children named the Stamp Act as "another cause of the Revolutionary War." Questions proved that they knew the requirements of the law but they failed utterly to understand their implications. Further questioning elicited the following from the pupils:

The cost of the stamps was small.

The stamp was not to be used on many things.

Only a small percentage of the people would have to use these stamps.

Few, if any, of the stamps were sold.

The law was repealed within a year.

The Stamp Act was another cause of the war.

Few in the class seemed interested in this recital of fact; none could see why such mild legislation should cause a serious quarrel, let alone a war. Here is a situation, rich in emotion and fraught with human significance, but rendered cold and inert because fact was emphasized at the cost of the spirit.

Begin the lesson on the Stamp Act by a *résumé* of the development of self-government in the colonies. Let the children see how zealously the colonists guarded the liberties acquired by the sacrifice of generations. Present the Stamp Act as the people of the day saw it—the symbol of England's determination to reduce the freedom so highly coveted.

At once, the cost of the stamps loses all significance but the requirement of stamps becomes ominous. Let the class see the English vessel in the Harbor of New York bringing the stamps, the mob that gathered to prevent the landing of the stamps, the committee reaching a compromise to deposit the stamps in a safe place until further orders are received from the home government, the protest meetings, the bonfires, the burning of the captain of the vessel in effigy, and the similar resentment in other cities. This new picture is rich in emotional background. As the children feel a keen admiration for the courage and the loyalty of the colonists, they, too, grow in courage and loyalty to an ideal.

The lesson in civics was on food inspection. The outline on the blackboard showed that this duty is performed by federal, state, and local officers; furthermore, that the inspection includes meat, milk, drugs, bakeries, canneries, and the like. Nothing was injected into this mass of information to stir it to life. Facts, facts, more facts! No picture of the complexity of modern social living; of the highly specialized forms of labor; of the dependence of any one person on the legions that produce his shoes and clothing, build his house, and prepare his foods; of the need of inspection; of the trust that we must place in unseen and unknown hands to safeguard our health and life; none of these was vouchsafed to the pupils. At no time were the pupils required to trace the consequences of the action of a dishonest inspector who passed diseased meat or milk rich in typhoid bacteria. Nothing was done to help children get a glimpse into the extent of this indirect murder; nothing was said to help them understand the sanctity of public trust upon which our highly integrated society rests. Here was a neglected opportunity to call forth sympathy, loyalty, enthusiasm, scorn for the wrong, pity for the innocent victims of dishonesty or carelessness—a whole array of intensely social attitudes.

We have considered ways in which the curriculum can modify and refine emotions. New experiences rouse new interests and stir new emotions; new experiences indirectly create new impulses, new motives to conduct. Here lies the

hope of moral training. No need to eradicate vulgar emotions and their unsocial impulses. Each ideal, once it is understood and accepted, evokes a higher emotion which has an expulsive power over lower ones. To illustrate: Hatred of an enemy may be dissipated by pity at the sight of him in distress. Genuine love kills lust. Anger at a wrong done will give place to admiration when the offender does somebody a kindness. When the higher emotions—pity, love, and admiration—are aroused, the lower ones—hatred, lust, and anger—die. The expulsive power of higher emotions makes moral education possible.

2. *The Environment and Emotional Refinement.*—The environment, aside from the school, is constantly creating new interests and hence stimulating new emotions. The mind mirrors within the splendor of the world without. We must create for the child surroundings pleasing and attractive. The architecture of the school must have beauty. The classroom must be appropriately decorated with pictures, casts, aquaria, and plants. Every part of the school must be clean, in good repair, and pleasing in color. The effects of an æsthetic environment are intangible but real and potent. Those who have seen children of miserable tenements nail up pictures to cover ugly blotches on the walls of their homes and coax stubborn little plants to grow on window ledges that have not yet been discovered by the sun, have evidence of the subtle inspiration of a suitably decorated classroom.

Parents must open the windows of growing souls to nature's grandeur. They must teach their children to look up to the stars, to see the beauty of a glorious sunset, to find joy in green fields and wooded hills. Not more than a suggestion may be necessary to stir dormant æsthetic sentiments, but without that suggestion, the child may look but fail to see. John Ruskin, while still a young boy, was taken traveling by his parents to various parts of England and the continent. They never failed to point out to the lad the beauty of nature. In his later years, Ruskin said, "These scenes that I would not have noted myself revealed to me their beauty and inspiration." Parents who imitate the practice of the elder

Ruskins must discourage insincere responses. This type of æsthetic education attempted at too early an age may produce not a true love of beauty but rather an affected sentiment which prompts the mouthing of empty words.

The social environment may be utilized effectively in training emotions and attitudes. Parents must weave such relationships about their children as will stir their potential altruism. From the earliest years, the child should learn not to take undue advantage of the goodwill of others. He should be taught to dress and undress himself and carry out the routine of the day with as little help from his elders as possible. The home should be interpreted as a coöperative enterprise and he should be required to carry his burden of service or economy. He should be given a training in humanness by caring for living pets. Circumstances should be so ordered that he experiences the joy of giving by presenting a less fortunate child with part of his treasure of toys.

Every club of boys and girls should be imbued with the idea of social service. Every class in a certain school has a definite social mission to carry out; one class supplies coal to a poor family, another buys shoes for poor children; still another pays for window boxes and flowers for a neighboring hospital. Those pupils who cannot make financial contributions are organized into a "Sunshine League," whose function it is to collect magazines, books, and newspapers and take them to hospitals whose patients crave for means of dispelling the tedium of the sick hours. The "Readers' Circle," composed of the oldest boys and girls, sends its members regularly to an institution for the blind, where they spend an hour or two reading newspapers and magazines to the unfortunate inmates. In all cases where financial aid is given, the children do not know the identity of the beneficiaries, but the knowledge of the service they rendered others stimulates the finer sentiments and prompts moral growth.

Personal Example as a Means of Refining Emotions.—Emotions are contagious, we observed, and tend to beget their kind. The genuine enthusiasm of teacher, parents, or playmates for the æsthetic and the socially desirable will soon

arouse similar reactions in the child. We copy the fears, the courage, the resentments and the pity of those for whom we have a genuine regard. In one class, history is the favorite study, in another, literature, in a third, composition; but in every case the pupils have simply caught their teacher's fire. The colorless teacher, who has no likes or dislikes, who never soars to heights but plods his way through the maze of prescribed subjects, deadens every spark of enthusiasm and stifles every emotion in his pupils. "Give me the teacher with preferences," said the wise old Greek philosopher.

Emotional Training through the Character of School Discipline.—That discipline which interprets school regulations as arising, not in the arbitrary dictates of principal or teacher, but rather in the social need of protecting each individual in the little community of the school, constantly fosters helpful social attitudes. Our earlier study of discipline urged that children be taught why property should be respected, why floors should not be littered with refuse, why shoes should be scraped clean of mud before entering the school building, why assigned exits be used, why papers be arranged uniformly—in a word, the justification for each school law. Discipline, properly developed through the recognition of the needs of an organized group, and not through blind obedience, gives children social insight and quickens the expression of those emotions that are of primary social significance.

Educating Emotions through Dramatization.—"Assume a virtue if you have it not" is not unsound psychological advice. The child who is urged to generosity and shares his possessions, grows kinder and more charitable with each expression of a virtue that he may not have possessed originally. Just as each emotion invariably produces its characteristic bodily activity, so, too, performing a characteristic act may induce the emotion. If we count ten in anger, we shall probably have no cause to regret rashness. Dejection, we are told, may be dissipated by folding the arms behind one's back, walking jauntily and humming a cheerful tune. Exuberant or inappropriate mirth can be reduced quickly by sitting in a moping posture, head drooping and hands folded in front. Adults who are afraid

in the dark usually find comfort in assuming a very manly pose and whistling a cheerful tune. The lad worsted in a fight checks his tears by forcing himself to laugh and thus maintains his bravado in the company of his playmates.

Emotion and bodily response are so intimately related that one is often thoroughly conditioned upon the other. We shall not enter the controversy of the James-Lange theory of emotions which holds that bodily changes "follow directly the perception of the exciting facts and our feeling of the changes as they occur, are the emotions." James contradicts Darwin's theory which makes activity follow the emotion. According to James and Lange, the child (1) sees the bully approaching—the idea; (2) feels respiratory changes and visceral disturbance and is seized with a desire to run—the activity; (3) becomes aware of fear—the emotion. Darwin, who wrote earlier than James, explained that the full significance of (1) the idea, the memory of what the bully did, induces (2) the emotion, fear, which is so intense that it sets up (3) bodily reaction. Evidence in support of each theory is usually of the subjective variety, and overlooks the fact that emotional responses after the age of three or four are so completely conditioned by a complexity of experiences that they defy analysis. Some psychologists hold a view midway between the two extremes; the intensity of the idea calls up an emotion which arouses bodily changes; these bodily changes, in turn, intensify the emotion. The timid lad sees the bully, becomes frightened, begins to run, and experiences even greater fear. Each expression of anger heightens anger until frenzy is induced; with each succeeding sob, a mere disappointment mounts to an overwhelming sorrow until fatigue dispels the emotion.

The lesson for the classroom teacher is obvious. If emotion and action are so vitally integrated, we can help children to induce a desired emotion by assuming the appropriate posture and going through its distinguishing activity. Here we have the psychological justification for dramatization in literature, history, and related subjects.

Let us turn to the opening scene of *Julius Cæsar*.

ROME. *A Street.*

[Enter FLAVIUS and MARCELLUS, officers, and certain commoners.]
FLAVIUS.

Hence! Home, you idle creatures, get you home.
Is this a holiday? What! know you not,
Being mechanical, you ought not walk
Upon a laboring day without the sign
Of your profession? Speak, what trade art thou?

FIRST COM.

Why, sir, a carpenter.

MARCELLUS.

Where is thy leather apron and thy rule?
What dost thou with thy best apparel on?
You, sir, what trade art thou?

SECOND COM.

Truly, sir, in respect of a fine workman, I am but
As you would say, a cobbler, etc.

Children, in their oral reading, rarely interpret this scene correctly. They do not differentiate the loud and authoritative questions of the officers from the meek and submissive answers of the commoners. Instead of explaining the exalted position of the officers in Rome and the lowly station of a commoner in order to secure a more appropriate rendition, let the child assume the physical posture of a Roman officer. At once, his voice is raised and his speech is domineering. In reading the reply of the second Commoner the child should assume the stoop of the old cobbler; automatically, his voice is lowered and a tone of deference is heard. An application of this principle of emotions to literature lessons would produce more spontaneous, more expressive, and more intelligent oral reading.

In the famous church scene of *Evangeline*, the children read in loud, angry tones:

What is this that ye do, my children? What madness
has seized you?
Forty years of my life have I labored among you, and
taught you,

Not in word alone, but in deed, to love one another!
Is this the fruit of my toils, of my vigils and prayers
and privations?

So, they continue, turning Father Felician's beautiful and touching exhortation into an ugly speech of fault-finding and scolding. Have a child ascend the imaginary altar with the faltering steps of the old priest and remind him that Father Felician spoke in tones deep and solemn, and "in accents measured and mournful." As the child assumes the posture, the walk, and the voice of the old priest, his rendition is at once appropriate to the thought. Classroom activities abound in opportunities to induce required emotions through dramatization. The emotion, although initially assumed, soon loses its pretense, and becomes a genuine emotional experience which sharpens and refines the sensibilities of the maturing child.

Cautions to Be Observed in Controlling Emotions.—*Never Take an Emotion at Its Flood.*—Emotions that are sharp and intense are usually short-lived and spend themselves quickly. When an emotion is at its height, an attempt to thwart it is most unwise. Caution counsels delay. Teachers have learned through bitter experience not to try to enforce a command while the child's anger is in its acute stage lest an inhibiting and unreasoning stubbornness set in. Once the emotion has subsided, the original order is carried out by the pupil who accepts punishment for his disobedience with meekness born of contrition.

To Wound an Emotion too Often Is to Deaden It.—To ridicule the same pupil day after day and to censure him regularly in public takes the sting out of shame and thus kills a potent deterring motive. In earlier sections of this chapter we saw that sympathy and pity lose their keenness in people whose lives are lived amidst the suffering sick and the destitute. The attitude of the hospital physician and the trained charity worker, probably more constructive because their pity and sympathy are now checked by the intellect rather than given free rein by sentiment, is nevertheless heartless in its dispassionateness.

Moral Growth is Prompted by the Expression of Social Emotions.—An emotion unexpressed is soon stifled. Only as we carry out the prompting of social emotions do we grow in moral fiber. Speak the kind word, grant the aid sought, forgive the wrong and you grow in kindness, sympathy, and integrity. Dramatization, stressing the æsthetic rather than the technical side of art subjects and literature, emphasis on the human rather than the factual side of social studies, membership in service squads which look after the cleanliness of the school building and school grounds, membership in social service clubs which secure articles for the poor or send readers to hospitals and homes for the aged—these are effective devices in refining and socializing emotions because they take full advantage of the dynamic aspect of emotion—they permit emotions to function.

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QUESTIONS FOR DISCUSSION

1. Make an outline preparatory to writing a comprehensive article on the topic—*The Part Emotions Play in the Economy of Life*. Will you include all that is given in this chapter? What limits will you set for your subject?

2. Distinguish instinct and emotion; instinct and feeling; feeling and emotion; feelings and organic sensations.

3. Why does this chapter, on the *Education of the Emotions*, discuss (a) the function of the autonomic nervous system and (b) the endocrine glands?

4. List callings or professions whose practitioners are especially interested in the effects of endocrine activity.

5. Make a study of the fears or the anger exhibited by a child. What kind of fears does the child exhibit? Which seem to have a rational basis? How will you account for the seemingly irrational fears? Ask and answer similar questions concerning anger.

6. Give an illustration, other than those found in the text, of each of the following:

- (a) Conditioning an emotion
- (b) Controlling an emotion through sublimation
- (c) Controlling an emotion through disuse
- (d) A change in attitude produces a change in the character of one's work

- (e) Changing the impulse but retaining the objective
- (f) Changing the objective but retaining the impulse

7. Give instances of the following:

- (a) Emotions retard action
- (b) Emotions quicken action
- (c) "A disembodied human emotion is a sheer nonentity"
- (d) The contagion of emotions
- (e) The range of emotions

8. "Emotions were developed in the course of evolution to increase our capacity for survival. Emotions make us objects to be feared. This is illustrated in the wild eye and the repelling appearance of an angry cat." Is this a statement of fact or an inference? Explain fully. What, then, is nature's purpose in introducing emotions in the evolution of animal life?

9. Analyze the sentiment known as "loyalty to country." Is it native? acquired? wholly acquired? What has contributed to its development?

10. To what extent do emotions serve as incentives in learning? In proper classroom behavior? Give examples.

11. Children who can give almost as many reasons as their teachers for condemning copying, nevertheless, may continue to cheat in tests. Explain this condition, stating probable causes and remedies.

12. What emotional appeals must be made to create a genuine school spirit? Be concrete in your answers.

13. List typical adult fears; typical children's fears; contrast these; account for the difference.

14. What practical classroom application may be made of the James-Lange Theory of Emotions?

15. Is a feeble-minded person capable of loyalty, bravery, love? Give reasons.

16. What would you include in a brief for making courses in the appreciation of art and music prescribed for all degrees conferred by liberal colleges of arts and science?

17. What changes in (a) curriculum, (b) methods of teaching, (c) modes of discipline would you make in the usual elementary school, in the interests of more effective education of the emotions? Give reasons.

18. What would you do to bring about the following:

- (a) diminished fear of lightning; of darkness
- (b) increased self-control in anger
- (c) greater effort in matters concerning personal appearance
- (d) greater desire to give and to serve

19. Name social responses that are produced, in the main, by emotional appeals. Think of war propaganda, breaking down sales' resistance, revival meetings, etc. Select any one of these and identify the emotions aroused.

20. Recall instances in which you (a) forgot an appointment; (b) mislaid a letter; (c) forgot the name of a person to whom you

had been introduced on more than one occasion; (*d*) made a slip of pen or tongue. Analyze these and ascertain to what extent these were caused by a desire (*a*) to be rid of the appointment; (*b*) to avoid showing the letter to others; (*c*) to be reintroduced to the person or to shun him; (*d*) to say something nearer your heart than the proprieties of the occasion required. What inferences can you draw from your analyses? Can you make an application to classroom discipline or teaching? Are all misreadings by pupils purely accidental? Is a child's repeated failure to bring his paint box and drawing material due to accident or carelessness? To what? How do you support your contention, by inferences or by fact? How reliable is your conclusion?

CHAPTER XXI

INTELLIGENCE

The History of Intelligence Tests.—Psychology is not a new study; nevertheless, it made comparatively little progress until the twentieth century mainly because it was excessively introspective, speculative, and metaphysical. It produced a set of commonplace maxims that contributed little to the understanding of human conduct. Lombroso (1836-1909) sought to explain antisocial behavior in terms of stigmata of degeneration, peculiarities in the shape of the head, in the character of the eyes, in the set of the ears, and what not. Pearson's researches revealed the utter unreliability of these anthropometric measurements and found that some Oxford men had more alleged stigmata than prison inmates.

With the opening of the first laboratory in experimental psychology in Leipzig in 1879, the movement for mental testing was launched. Galton did the first modern work on objective measurement of mental capacity. Cattell in America and Wundt, Fechner, and Weber on the continent, refined the Galtonian method and helped to establish the measurement psychology of our day. The first inquiry was based on the hypothesis that sensory gift was closely related to general ability. Experiments were, therefore, concerned with accuracy and speed of sense perception, with the span of attention, the vividness of imagery, and the like. A commentator summarizing this search for sensory sensitivity remarks that the prevailing belief seemed to be that the thick-skinned were also thick-headed.

The next step was based on the belief that motor skill is a measure of general skill, for all intelligence ultimately leads to activity, the prevailing argument ran. Despite the fact

that many gifted individuals are notoriously awkward in all forms of motor execution, motor skill was studied quantitatively in the search for a measure of intelligence.

A significant progressive step was taken with the discovery that a complex mental reaction is a better test of intelligence than a simple, isolated reaction like auditory recognition or ringing a bell at given signals. Intelligence tests require the subject to point out absurdities in given situations, to supply suitable words necessary to complete certain sentences, to give words of similar or opposite meanings, to solve arithmetical problems, and to indicate correct action in a predicament. Researches showed a high correlation between ability to perform these activities and general intelligence, the inborn power to obtain maximum results out of an experience. At this point in the history of psychology, the intelligence test was born; it is an objective instrument for measuring an individual's native power to learn.

What Is Intelligence?—Two people read the same book. To one the book tells a story, to the other, it presents a pitiless satire of life. Each person has his own ability to extract meaning from each experience. What he will obtain from each situation is determined—unless he received special instruction in preparation—by the intelligence he brings to bear upon it.

After pupils are taught how to write a direct quotation of the type, *Grant said, "Let us have peace,"* and how to divide \$24.36 by .06, ask them to divide \$2436 by .06 and to write, "The time has come," said the scout, "to make an accounting to the leader." One child cannot begin the assignments because they are different from the original types. A second child evolves modes of procedure, carries them out, and waits for the teacher to tell him whether his results are correct or not. But the gifted child does more—he checks his work and decides upon its accuracy for himself.

Intelligence refers to the degree of ability to (1) start and direct a line of thought; (2) adapt it to new situations; (3) apply self-checks or self-criticism to one's results. We may define intelligence, therefore, as the native capacity to

meet new conditions, or, even, as the native capacity to become intelligent.

Intelligence¹ refers to a composite function of mind. It includes recall, language comprehension, orientation in time and space, recognition of causal relationships, perception of likenesses and differences, resourcefulness in mechanical situations and in social relations, skill in analysis, synthesis and generalization of experience—all the mental reactions of a normal-minded individual.

What Is an Intelligence Test?—*The Basic Aim.*—The need of an objective instrument for measuring degrees of immaturity is apparent. Let us assume a scale of intelligence in which normal intelligence is in the exact center and the highest and the lowest degrees of intelligence are at the right and left extremes respectively, thus,

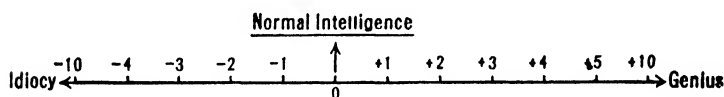


FIG. 13. THE RANGE OF INTELLIGENCE

To Lombroso and his school, individuals, at either end of the scale, are variants from the normal, have much in common, and exhibit different, but equally marked, degenerative tendencies. Modern psychology believes that these extremes are opposites, each bearing a far greater resemblance to the normal type than to each other; that the feeble-minded endowed with special gifts and the genius beset by degenerative tendencies are exceptional, not usual, phenomena.

Most children ten years old chronologically can do, among other things, the following when tested by the Stanford Revision of the Binet-Simon Scale.

¹ Other definitions of intelligence may interest the reader. Terman: "The ability to think in terms of abstract ideas"; Ballard: "The relative general efficiency of minds measured under similar conditions of knowledge, interest and habituation"; Thorndike: "The power of good responses from the point of view of truth or fact."

- (a) Define satisfactorily thirty words selected from a list of fifty.
- (b) Detect the absurdity in four out of five statements.
- (c) Copy from memory a geometrical figure studied for ten seconds.
- (d) Give answers that are sensible to two out of three problems arising in certain social relationships.
- (e) Give sixty words, spontaneously, in three minutes.

The immediate goal of the test is to establish norms of intelligence for each age. These norms become the graded points on the scale of intelligence. If a child of nine can do what most children of eleven do, his mental age is eleven; if he can do only what most children of seven do, then his mental age is seven. The successful intelligence test is, therefore, an objective instrument which gives us an individual's measure of intelligence in terms of the intelligence of other people of like age.

Types of Intelligence Tests.—The simplest classification of tests is in terms of the nature of the reaction. We have *language tests* and *nonlanguage* or *performance tests*. Typical of the former are the Binet Test, the Stanford Revision of the Binet Test, The Army Alpha Test, The National Intelligence Tests, The Thorndike Intelligence Tests, The Otis (higher) Tests, The American Council on Education Tests. In these tests, the student's control of language determines both his comprehension of the problem or directions and his response. With children who suffer from temporary language disabilities because of foreign environment, this limitation may be a serious factor.

Typical of the questions in an intelligence test of the verbal type, we may list the following:

1. Completion:

Fill in with suitable words—Arithmetic is taught in school because it is useful in later

2. Information:

Encircle the correct word—Diamonds are obtained from (a) mines, (b) oysters, (c) elephants, (d) reefs.

3. Recognizing identical relations:

A locomotive is to a train as a horse is to (a) an automobile, (b) a buggy, (c) a railroad station.

4. Successive reasoning:

Is the following true or false? D is shorter than S. J is shorter than B. Therefore, J is shorter than S.

5. Recognizing the implications in proverbs:

Don't put all your eggs into one basket.

Check the proverb which means about the same as the proverb above.

——— Time and tide wait for no man.

——— A stitch in time saves ninety and nine.

——— Don't carry all your money in one pocket.

6. Arithmetical reasoning:

By using the signs +, —, ×, and ÷, indicate what must be done to get the answers for the following problems:

By selling for 12c I lose 3c; what is the cost? _____

7. Perception of number sequence:

Write 2 numbers that complete each series,

(a) 2, 4, 6, 8, —, —.

(b) 2, 6, 4; 8, 12, 10; 6, —, 8; 4, 8 —.

8. Recognition of the incongruous:

What is absurd about the following:

Excavators found a coin dated 240 B.C.

Ans.

In the performance tests, of which the Pintner-Patterson, the Dearborn, the Detroit Kindergarten, and the Stenquist are examples, the pupil may be shown three pictures each representing half of a common object like a vase, an open umbrella, or a lamp shade, and is then asked which two to combine to make the whole object; to check all the pictures that "tell it is winter"; to draw a triangle or a diamond-shaped figure; to insert wooden forms into appropriate depressions, in a large board; to reach a given place through a maze; to select and assemble the parts of an electric bell; and the like.

Another classification is based on the number of individuals to whom a test may be administered at one time. This gives us the obvious division into individual and group tests. The Stanford Revision of the Binet Test is given to one child at a time; The National Test may be taken simultaneously by a large group. The relative merits of these two types of tests are summed up in tabular form below:

<i>Characteristic</i>	<i>Individual Test</i>	<i>Group Test</i>
1. Economy	1. Time-consuming and financially costly.	1. Marked economy of time and money.
2. Accuracy	2. As a rule, distinctly more accurate.	2. As a rule, less reliable than an individual test.
3. Form of response	3. Less writing because frequently answers are given orally and checked by the examiner on his record.	3. The subject performs all the writing and carries out all the directions. At the end of the test, each person leaves a complete and permanent record of his performance.
4. Opportunity for interpretation of reactions	4. The examiner has ample opportunity to observe the character of the responses, to note whether they are impulsive, thoughtful, quick, slow, or given with assurance.	4. There is practically no opportunity to observe the character of the reactions. The subject is judged by his final product, regardless of how he obtained it.
5. Examples	5. Binet-Simon, Stanford Revision of Binet Scale, Yerkes-Bridges Point.	5. Otis, Haggerty, Army Alpha, National, McCall Multi-Mental.

When large groups must be tested, it is advisable to use a group test and supplement it by individual tests in borderline cases and in all instances where the test results and the teachers' judgments show serious discrepancies.

How Is the Measure of Intelligence Expressed?—The tests give for each child a mental age, regardless of his chronological age. The ratio, multiplied by 100, between mental age (M.A.) and chronological age (C.A.) gives the intelligence quotient (I.Q.) for a child. Pupil X, ten years old, shows a mental age of ten; his I.Q. is $\frac{10 \text{ M.A.}}{10 \text{ C.A.}}$ or 100 or normal.

10 C.A.

Pupil Y, 9 years old, has a mental age of 12; his I.Q. is $\frac{12}{9}$ or $\frac{4}{3}$ or 133; Pupil Z, 9 years old, has a mental age of 8;

his I.Q. is $\frac{8}{9}$ or 90.² The I.Q. tells us the rate at which

a child has progressed to his present point in his mental development. Figuratively expressed, it is, "a division of what is by what ought to be."

The I.Q., when compared with a measure of achievement, indicates the effort or accomplishment which a child displays. To measure the achievement of a pupil in any given subject, say arithmetic or reading, we determine, by suitable scale in arithmetic or reading, his level of performance. Let us assume that pupil Y, above, can read no better than most 10-year-old children. His achievement quotient, sometimes called accomplishment quotient, in reading is the ratio of his reading age to his mental age, thus:

$$\frac{\text{Reading Age, (R.A.) } 10}{\text{Mental Age, (M.A.) } 12} = 83, \text{ Achievement Quotient in Reading}$$

If pupil X, above, has an arithmetical age of 9, his arithmetic quotient is obtained, thus:

$$\frac{\text{Arithmetic Age, (A.A.) } 9}{\text{Mental Age, (M.A.) } 10} = 90, \text{ Achievement Quotient in Arithmetic}$$

It is reasonable to assume that, regardless of their chronological ages, these two pupils are not learning up to their highest academic possibilities in these two subjects. As a rule, children with high I.Q.'s are likely to show greater retardation, in relation to their capacity, in school subjects than those with low or normal I.Q.'s. Because superior children meet the standards of their chronological ages and of the grade in which they happen to be, no added demands are made of them. They are, therefore, in danger of acquiring habits of indolence and an exaggerated feeling of superiority. The group with I.Q. of 80 to 90 receives, in all likelihood, the greatest benefit from school, in proportion to its ability;

² It is common practice to omit the decimal point in stating the intelligence quotient, hence each of the above quotients has been multiplied by 100.

these children are so near the average that they are pressed especially hard to exert their utmost in the hope of meeting the standard of the normal pupils.

We must not assume that a mental age is a distinct level of development, uniform for all children. Nothing is further from fact. Children with a mental age of ten show marked variations in ability and in promise. A mental age simply means a degree of mental ability found in the average child of corresponding chronological age. Apart from the chronological age, a mental age tells us little. To designate a particular child as having a mental age of ten may imply as much cause for sorrow as for rejoicing, depending on the number of years he has lived.

Limits of the Scales.—It is customary to assume that 14 to 16 is the age when a normal mind attains its maximum intelligence. Dearborn is inclined to set the age at 14.6. Thorndike, Freeman, Otis, McCall and others present curves, representing the development of intelligence, which gradually level off at eighteen and even later. Adults know more than sixteen-year-old adolescents, they are more sophisticated because of their wider experiences, but they do not necessarily possess greater intellectual power. In recent years, Terman has done much in an attempt to measure with greater precision the upper limits of intelligence, while others have labored as earnestly to refine the lower limits. Kuhlman³ and Gesell⁴ are evolving tests for infants at such low age levels as three, six, nine, and twelve months. The nine- and ten-year-age levels are commonly regarded as the most reliable measures of an intelligence scale.

Significance of Different I.Q. Levels.—If we were to examine one hundred children selected at random, we would probably find them distributed as follows:

The lowest individual would have an I.Q. of 70 or less

The lowest 25 individuals would have an I.Q. of 90 or less

The middle 50 individuals would have an I.Q. of about 90 to 110

³ F. Kuhlman, *A Handbook of Mental Tests* (Warwick & York, 1922).

⁴ Arnold Gesell, *The Mental Growth of the Preschool Child* (The Macmillan Co., 1925).

The highest 25 individuals would have an I.Q. of about 110 or more

The highest individual would have an I.Q. of 130 or more

This is about the kind of distribution we would expect under normal conditions. The I.Q.'s obtained by different tests do not follow the same distribution. The I.Q.'s here cited have reference to the Stanford Revision of the Binet Scale. A child having an I.Q. of 60 to 74 as a result of the Illinois Intelligence Examination would belong in the lowest 7 per cent of the group. But if the I.Q. were 70 or less by the Stanford Scale, he would be classed in the lowest 1 per cent. All these I.Q.'s are approximations and the dividing line between any two classes is not sharp and unvarying. The intelligence tests have been called "mental yard sticks." So long as we remember that these measures vary, there is no harm in the metaphor. The significance of each level of intelligence is set forth below.

<i>The Classification</i>	<i>Type of Child</i>	<i>The I.Q.</i>
Superior Children	Near Genius	140
	Very Superior	120-140
	Superior	110-120
Average Children	Normal	90-110
Children Below Average but Normal	Dull	80-90
	Borderline	70-80
	Moron	50-70
Children Feeble-minded and Worse	Imbecile	25-50
	Idiot	0-25

Educational Tests.—Intelligence tests must not be confused with educational or achievement tests. The latter are designed to measure a pupil's acquisition of knowledge and skill in a particular school subject. An educational test in arithmetic gives norms for each age and grade; these express the extent and the quality of the performance of most pupils of a given age and grade. A teacher may be discouraged at her in-

ability to bring her class up to standard in penmanship or in spelling. A standardized achievement test may reveal the fact that she aimed too high and that most of her pupils are doing as well or better than children of similar age and grade.

With the aid of these tests, we can make a profile of a

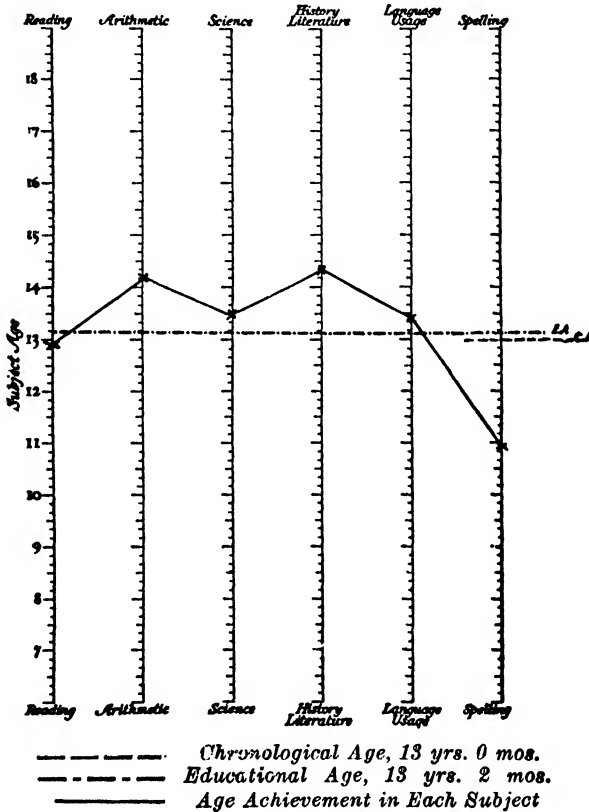


FIG. 14. PROFILE OF A PUPIL'S ACHIEVEMENT BY THE STANFORD ACHIEVEMENT TEST (WORLD BOOK CO., YONKERS, N. Y.)

child's school accomplishment which tells at once his relative position in each study with respect to his age, his grade and his achievement in other subjects. Figure 14 gives the reader a profile of the chronological age (C.A.); the educational age

(E.A.), the average of all scores, in years and months, obtained by combining all the subjects; and, finally, the actual score, in years and months, in each test. This is a summary of findings by the administration of the Stanford Achievement Test. The educational age divided by the mental age gives us the achievement or accomplishment quotient. The child with an achievement quotient, $(A.Q. = \frac{E.A.}{M.A.})$ of 100, is progressing up to his full intellectual possibilities; those children with an A.Q. of less than 100 can, presumably, do better work, and those with more than 100 are putting added strain on their resources. Superior children, in the sense defined in the tabulation above, usually have an Accomplishment Quotient less than 100, whereas conscientious and ambitious dullards may achieve an A.Q. decidedly over 100.

The A.Q. as a measure of achievement is not without limitations. It presupposes a perfect agreement between general intelligence and ability in school subjects. But this is decidedly not so; the agreement or correlation is about .87 and varies with different subjects. The teacher who expects an A.Q. of 100 of all children in all subjects is asking for what can probably not be. The A.Q. must be interpreted liberally and not without adequate knowledge of the child himself.

Limitations of Intelligence Tests.—1. *Is There Agreement Concerning the Nature of Intelligence?*—Many objections have been raised against the validity of intelligence tests. Some of these disturb the very foundation on which these tests rest; others are mere expressions of fear that a potent instrument will be used to introduce an intellectual determinism that is inimical to public education in a democratic society.

The most common objection to intelligence tests is that while they purport to measure intelligence there is no agreement concerning the nature of intelligence, the power or function that is being measured. To most psychologists, intelligence is a congenital capacity and hence not susceptible of increase. Stern regards it as "a general adaptability to new

conditions," a single complex factor. To Thorndike, it is a multiplicity of abilities that are related in varying degrees. He, therefore, distinguishes three types of intelligence: mechanical, social, and abstract intelligence. One may show skill in meeting a mechanical problem but little penetration in understanding economic, political, or ethical implications in a human situation; or, one may reveal consistent keenness in linguistic or mathematical relationship but fail to understand the theory of genes and the mechanism of inheritance. These three types of intelligence are positively related but the coefficients of correlation are not very high.

Inability to define and identify a force of life is no reason for rejecting the instruments designed to measure it. What theory of electricity enjoys universal acceptance? Nevertheless, we measure electricity by the work it does and hope that we may ultimately know its innermost secrets. The preponderance of evidence, despite some exceptions, tends to support the conclusion that intelligence is a native endowment and remains reasonably constant throughout the maturing years, unaffected in any significant degree by systems of home training or formal schooling.

2. *The Tests Measure Intelligence Indirectly.*—In the final analysis, most tests measure intelligence through language, spoken or printed, and in terms of general knowledge. The child whose home is intellectually and spiritually drab lacks the background of his more fortunate classmate who hears good English at home, who travels, and enjoys the stimulation of intelligent intercourse with adults. We have never successfully factored out linguistics and sophistication in arriving at a judgment through an intelligence test. That these conditions are true is not disputed to-day, but few psychologists believe that they modify the result to any serious extent. In spite of these modifying factors—language and social background—no well administered test would classify a dull normal child as superior nor a superior child as belonging to the borderline group. The tests do, however, affect the rank position of a child slightly; they may raise or lower a normal child's I.Q., but probably will not cause him to obtain an

I.Q. many points above or below the I.Q. he would have obtained if he had enjoyed the "average environment."

Some students,⁵ unmoved by this criticism, have frankly taken a decided stand for linguistic tests. They assert that conceptual intelligence or abstract thinking cannot be measured except through the use of words and other symbols, like numbers; and that nonlanguage situations involve very little abstract thinking and are, therefore, ill-adapted to gauge the power of conceptual intelligence. The linguistic aspect of the tests, it would appear, is, therefore, not a limitation but an added element of strength. We may discern, among the younger psychologists, the following line of thought: Inheritance and environment, together, shape the individual and determine his development. If we are to measure, with reasonable accuracy, his inherited intelligence, we must assume approximately similar environment. Otherwise, how can we hope to measure the "common learnings"? And this, the argument runs, is precisely what the intelligence tests do and what they measure. The right to make this assumption, for purely theoretical purposes, we may safely grant. But what if the conclusions are carried out in the actual administration of public education?

Influence of environment on the I.Q. We have sufficient data to question the orthodox view that environment has little or no effect upon intelligence. Cyril Burt's⁶ experiments lead him to the belief that over one-half of the gross result of a test is due to schooling and that "linguistic ability exerts upon the Binet-Simon tests a special and positive influence of its own." Dearborn⁷ grants a possible overstatement by Burt but adds, "There is nothing in these findings to gainsay the equally probable hypothesis that the amount and quality of school work contribute to the standing in the Binet tests."

⁵ L. M. Terman, "Intelligence and Its Measurement: A Symposium," *Journal of Educational Psychology*, Vol. 12, No. 3 (March, 1921).

⁶ Cyril Burt, *Mental and Scholastic Tests* (London, King and Son, 1921).

⁷ W. F. Dearborn, *Intelligence Tests* (Houghton Mifflin Co., 1928), p. 119.

Gordon⁸ tested canal-boat children and gypsy children and found a correlation of $-.75$ between chronological age and the I.Q., that is, the older the child, the less intelligent, in proportion to his age, does he seem to be. His explanation is certainly not without merit. The tests for very young children do not depend upon information acquired in school but those for the older children do. These particular groups of children have a most irregular kind of school life, often, none at all. Children who at six tested 90 to 100, tested only 70 at the age of fourteen. Hence, Gordon concludes that the test results are influenced positively by the extent and quality of the schooling.

Much experimental work must still be done to determine quantitatively and qualitatively the extent to which environmental factors determine the final results of intelligence tests. At present, the tests presuppose that the child enjoys normal contacts with life; that children brought up in comparative isolation are at a disadvantage; that those with especially rich backgrounds enjoy corresponding advantages; but in neither case are the final measures of intelligence changed to a significant degree.

3. *Test Technique Is Not Adequately Standardized.*—Two physicians, each using his own stop watch and sphygmomanometer, obtain the same pulse and respiration rates and diastolic and systolic blood pressure readings of the patient whom they are examining. But two examiners testing the same child may obtain, by the same test, I.Q.'s for him of 90 and 105 respectively. The same examiner testing a child may obtain an I.Q. of 90 by one test and 110 by another. Changes in the technique of scoring make a difference, but who can say to-day what technique will give the most reliable results? We do not even know the unit in terms of which we measure intelligence. An I.Q. of 110 is a ratio of mental age to chronological age; but the mental age is determined by a score of x points of a particular scale. What is the value of a point

⁸ Hugh Gordon, "Mental and Scholastic Tests Among Retarded Children," London Board of Education. Educational Pamphlet No. 44, 1923. Cited by Dearborn.

on that scale? Of 80 points? Is a score of 80 just twice 40? No one can say. Is a total of 80 half of 160? Again, we cannot answer. Intelligence tests are emergent rather than perfected instruments for measuring a composite of mental functions.

4. *Intelligence Ratings Alone Cannot Be Used to Predict Probable Success.*—The measure of intelligence, apart from qualities of personality, tells us little about an individual. A fundamental characteristic of germ plasm is its potent tendency towards self-determination, as expressed in drives towards comfort, competition, self-assertion, sex gratification, indolence, marked activity, corpulence, baldness, etc. These forms of self-determinism we call by various names—predispositions, interests, instincts, desires, character traits, and even intelligence. An individual given to moodiness and to indolence will, even if his intelligence quotient be 135, accomplish less than another, who combines with an intelligence quotient of 100 tendencies of an extrovert character—an exuberance of activity and a persistent desire to succeed. Who will not give twenty points of intelligence as measured by the scale to be rid of improvidence, or of a sense of inferiority or of an anxiety neurosis—personality traits that blight many a mind of promise.

The fact that intelligence alone is inadequate for the effective performance of the business of life is no reason for quarreling with the tests. We are pointing out, not the limitations of the tests themselves, but rather, the limitations of intelligence as an isolated factor in the equipment for life.

5. *The Measure of Intelligence Is Not a Measure of Special Abilities.*—While the correlation between intelligence and proficiency in such subjects as arithmetic, reading, and composition is high, the correlation in the case of penmanship, drawing, and manual arts is often decidedly low. Mechanical and motor experiences require a type of ability not revealed in the measure of intelligence alone. Special supplementary aptitude tests must, therefore, be given to ascertain the extent of these specialized abilities.

Values of Intelligence Tests.—1. *For Gradation.*—Intelli-

gence tests are to-day effective instruments for classifying pupils into homogeneous groups, because the intelligence quotient, once accurately ascertained, tends to remain constant for most children. We must not, of course, determine a child's grade by his I.Q. A child of twelve with an I.Q. of 90 may be ready for the work of the seventh grade, while his nine-year-old brother with an I.Q. of 130 would be lost in that grade. The mental age and the background of school achievement determine the school grade of a pupil; the I.Q. helps in classifying pupils of a given school year.

Reliability of teachers' judgments. School people often assert that the most reliable estimate of a pupil is the teacher's judgment based on cumulative experience with him. Six thousand teachers were asked to nominate pupils for membership in a class of gifted children, by telling (1) who is most intelligent in the class, (2) who is next, (3) who is third, (4) who is the youngest chronologically considered, and (5) who was considered the most intelligent by the last teacher. It was found that nomination by designating "the youngest yielded more children that would otherwise have been missed than any other method of nomination." The conclusion reached is that in seeking⁹ "the brightest pupil in a class of from thirty to fifty, the chances of proper selection are better if we consult the birth records than if we ask the teacher." The judgment of any teacher with respect to the intelligence of his pupils depends upon his own intelligence, his training, his experience, and the extensiveness of his contacts with them. No final estimate of a child should be reached without giving full and sympathetic consideration to the teachers' judgments, but no teacher's estimate should be accepted as final; it should be supplemented with the best objective checks or tests devised by the psychologist.

Constancy of the I.Q. Belief in the constancy of the I.Q. presupposes a continuation of similar conditions under which tests are administered and the child lives. Radical changes in health, and such unfavorable conditions as worry, bad com-

⁹ Terman and others, *Genetic Studies of Genius* (Stanford University Press, 1925), Vol. I, Ch. ii.

panionship, and an attitude of indifference, lead to decided changes in the relationship between mental and chronological ages.

The belief that intelligence may develop in spurts with alternating periods of retardation and acceleration is based on physiological and biological considerations. Since physiological development and intelligence show correspondence, the development of intelligence may follow the irregular curve of physiological development. Data collected, notably at Harvard, give a basis for such a possibility, but, thus far, both acceleration and retardation in the development of intelligence are extremely small.¹⁰ A related line of thought is carried a bit further: Man can adapt himself to surprising extremes of temperature, diet, air pressures, and the like, depending upon the demands of his environment. This margin of adaptability is his margin of safety, for without it he would perish in an environment even slightly unfriendly. By analogy, the conclusion is reached, that mind is, at least, as adaptable as the body in meeting the changing demands of life. To hold that intelligence is a fixed unalterable power, regardless of the influence of environment, is a gross error, for it denies the mind the margin of safety evidenced in all our somatic adjustments. This conclusion, logical, to be sure, will be useful only when supported by actual experiences. Reasoning by analogy is ever precarious.

Experimental evidence sanctions the following summary statements concerning the constancy of the intelligence quotient:

- (a) The I.Q. is not absolutely constant.
- (b) The classification of children into superior, normal, dull, and feeble-minded, established with the intelligence tests, remains practically unchanged in a retest.
- (c) In the retesting of children, changes are noted but the middle 50 per cent of the changes lie between -3.3 and $+5.7$, hence the probable error of prediction for this group is about 4.5.
- (d) Increasing the interval between the original test and the re-

¹⁰ F. W. Dearborn, *Intelligence Tests* (Houghton Mifflin Co., 1928), Ch. iv.

test from a few months to a few years makes no significant change in the results.

(e) Those with high I.Q.'s, 140 and over, tend to lose their advantage of rating at the 12 or 14 year levels. But again, this is no serious condition since only one per cent or less of a group is thus affected.

Diagnosis of neglect of individual differences in education. Dearborn¹¹ presents an analysis of the median chronological and mental ages of pupils in the several grades of elementary and high school.

Those with low I.Q.'s do not survive beyond the eighth grade. This is shown not only by the I.Q.'s, but also by the decrease in the difference between the chronological age, C.A. and mental age, M.A. of the older pupils. The gain in mental age slows down with the increasing age of the pupils. The range of ability is decidedly large as is revealed by the difference between the 25th percentile, Q_1 and the 75th percentile, Q_3 in any one grade. The school that attempts to teach this conglomerate of abilities by following a uniform course of study and using uniform teaching methods is doomed to failure. "We are tempted to conclude," says Dearborn,¹² "that advancement in school is determined more by the age of the pupils than by their intelligence." Despite their inherent weakness, intelligence tests do make a vital contribution towards helpful classification of pupils and towards changes in curricula and pedagogic procedure.

2. *For Prediction.*—Since the I.Q. remains fairly constant, we can use intelligence tests in educational and vocational guidance. A child with an I.Q. of 100, doing 65 per cent school work should not be advised to pursue the academic high-school course which prepares for college entrance. A suitable vocationalized course is in closer keeping with this child's ability. Irreparable harm is done annually to thousands of children who, having neither intellectual capacity nor interest, nevertheless, are forced into secondary school by

¹¹ Dearborn, *op. cit.*, pp. 155-156.

¹² Dearborn, *loc. cit.*

THE MEDIAN CHRONOLOGICAL AND MENTAL AGE OF PUPILS IN THE SEVERAL GRADES OF THE ELEMENTARY
AND OF THE HIGH SCHOOL ¹

	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Median C. A.	7-9	8-10	9-8	10-9	11-6	12-8	13-4	14-5	15-2	16-4	17-4
Median M. S.	7-6	8-7	9-5	10-7	11-7	12-9	13-11	15-3	16-1	16-11	17-3
Q ₁ Q ₃ M. A.	11 mos.	16 mos.	16 mos.	23 mos.	23 mos.	28 mos.	29 mos.	27 mos.	24 mos.	27 mos.	24 mos.
Gain in M. A.	13 mos. 10 mos. 14 mos. 12 mos. 14 mos. 14 mos. 14 mos. 16 mos. 10 mos. 10 mos. 4 mos.										
Median I. Q.	97	97	97	98	101	101	104	...	...	...	...
(Av. Adult, 14½) ....	...	...	...	...	...	...	...	106	111	117	119
(Av. Adult, 16) ....	...	...	...	...	...	...	...	106	106	106	108

¹ Walter F. Dearborn, *Intelligence Tests* (Houghton Mifflin Co., 1928), p. 155. Used by permission of, and special arrangement with the authorized publisher.

overzealous parents. These pupils emerge after a semester or two, with a record of failures that could have been foretold and with a haunting memory of failure that may permanently undermine that sense of self-confidence so vital in bringing any enterprise to a successful issue.

Many communities do not admit children under six or seven to the introductory school grade. An intelligence test can tell better than the chronological age whether an exception should be made for certain children. The superior child of five will get more out of his year's schooling than the normal or retarded child of six or seven. The mental age of the child of five, not its chronological age, should determine admission.

The measure of one's intelligence should play an important part in the selection of his calling. While there is a wide range of abilities among those who are successful in any vocation, there is a low limit beyond which satisfactory attainment is impossible. The table below gives some of the scores obtained by various occupational groups which took the Army Alpha test:

- 40- 49: Farmer, laborer, general miner and teamster
- 50- 59: Tailor, barber, painter, truck chauffeur, baker, cook, bricklayer, and cobbler
- 60- 69: General machinist, lathe hand, general blacksmith, brakeman, locomotive foreman, auto chauffeur, telegraph and telephone lineman, . . . railroad shop mechanic, locomotive engineer, detective and policeman, etc.
- 70- 79: Truckmaster, receiving and shipping clerk, stock keeper
- 80- 89: General electrician, telegrapher, bandmaster, photographer
- 90- 99: Railroad clerk, general clerk, filing clerk
- 100-109: Bookkeeper, army nurse, etc.
- 110-119: Mechanical draughtsman, accountant, civil engineer, Y.M.C.A. secretary and medical officer
- 120 and over: Army chaplains and engineering officers

The coefficient of intelligence of these trades and callings

must not be taken too seriously. Success in a vocation is determined more by personality traits than by mere intelligence. But, a lad of courage, patience, loyalty, accuracy, ambition—priceless qualities, indeed—having an I.Q. of 70 should be discouraged from taking a commercial course unless his school work belies his low intelligence score. Again, we find innumerable instances in which unguided youths aim too low in their vocational selection. To permit such a child to follow his own choice is to destine him to a life of drudgery. Joy is found in that work which is somewhat above the average of one's ability. What is drudgery but activity distinctly below one's intelligence?

Objection to the tests is often based on the fact that the judgment of capable and experienced teachers supplemented by discriminating cumulative school records of a child's performances gives adequate data for wise classification and for reasonably correct guidance. The merit of this assertion is obvious. But we must face facts. Each year the schools must make adjustments for large numbers of new entrants and for pupils transferred from other school systems. For most of these children we have neither the judgment of teachers nor reliable school records. The situation is frequently aggravated by school records that are woefully incomplete and by judgments of mediocre teachers. Imperfect as intelligence tests of our day may be, they can nevertheless render significant service even if used as supplementary and not primary diagnostic instruments.

3. *For More Effective School Supervision.*—Intelligence tests have done much to introduce an objective and scientific attitude into administrative problems. Two classes of the same grade do work that differs in quality and quantity. Shall the supervisor accept the teacher's judgment that her class is intellectually inferior? Suppose a thirty-minute examination of the class in school studies leads him to the conclusion that the class is "about average." Who is right? Shall we accept the more mature judgment of the supervisor or the judgment of the teacher which is based on her continuous relations with the children?

We harass the intellectually weak child and frequently neglect the superior one. It is an open secret in school circles that many gifted children show the lowest achievement quotient. Shall we rest content with a 70 per cent grade in a subject matter test? The answer depends on the pupil. If he has an I.Q. of 90, he may be exerting his utmost effort; if he has an I.Q. of 115, persistent but judicious prodding may be necessary.

Without a measure of intelligence, we have no basis for computing retardation and acceleration. The most common cause of retardation, a low level of intelligence, is frequently forgotten. When retardation is judged by chronological age, we set up a standard of achievement altogether too high for some and decidedly too low for others. In what grade does a ten-year-old child belong? If he is mentally as well as chronologically ten years old, and began schooling at six, he ought to be in the fifth grade; if he is mentally eight years old, he ought not to be considered retarded if he happens to be in the fourth grade; but if he is mentally twelve years old, he is decidedly retarded if he is in the fifth grade, even though he leads his classmates. Judged by mental age, we find that dull children are usually less retarded than they ought to be and, correspondingly, superior children less accelerated than they ought to be.

With an accurate measure of intelligence, it is possible to appraise the true significance of commonly reputed interfering factors in learning. Adenoids have been held accountable for feeble-mindedness by some; others insist that, although these growths may be physiologically undesirable, they make little difference in the intellectual capacities of the victim. Early introduction of school subjects, exclusive association with children, less than normal contact with adults, improper ventilation, unbalanced diet—these are frequently cited as retarding factors in mental development. On the basis of personal experiences and verbal logic, a telling case can be made out against each of them. When personal opinion is checked against actual tests, we find the indictment severely overdrawn.

Intelligence Tests Have Laid the Ax to Many Unfounded Traditions.—*Is Intelligence Improved by Training?*—There is a degree of flexibility, plasticity, it is called by some, for each capacity that responds to training. Human beings can be made fleet of foot, more agile in attack and self-defense, but they cannot transcend their fixed limits in these functions. The development of an innate mental ability may be quickened but not beyond its limit of growth. Feeble-mindedness is not outgrown with the coming of pubescence nor is it overcome by the routine of work, however wisely planned, in a class for ungraded children. To gain the full measure of growth, we need confidence, enthusiasm, and genuinely motivated provocative situations. But the limit of development of any function, physical or mental, seems definitely fixed by inheritance.

Is the Child of Superior Intelligence "Queer"?—We must definitely renounce the old belief that gifted children are weak, anemic, averse to play, nervous, and frequently neurotic. Extended investigations reveal evidence that leads to contrary conclusions. Mentally superior children are, as a rule, better developed physically, have fewer physical defects, are less nervous, are less subject to neurotic expressions, and are more fond of play—vigorous, physical play—than their inferior brothers and sisters. There are, of course, exceptions to our statement, but taken as a class, the gifted child exhibits these advantages. When mentally superior children play less, the cause is usually found in other interests that claim their attention. The problems presented by these children have their origin, not in psychopathic tendencies, but rather in the superior mentality that prompts them to challenge the inadequate reasons so often given them to justify an imposed regimen of life.

Precocity is commonly regarded as a temporary gift of childhood which is altogether too short-lived. There is no evidence to justify such an assertion. On the contrary, precocity does not spend itself; it persists, just as feeble-mindedness does, from early years to maturity. A precocious child may exhibit a neurotic strain, but this is due, in all probability, not to precocity, but to inherited degenerative ten-

dencies. Not all precocious children attain eminence in maturity; but no one has ever seriously insisted that to possess ability is to use it.

Are Gifted Children Especially "Uneven"?—The term "unevenness" is often used to designate marked variations in different types of abilities. Unusual skill in graphic reproduction with marked deficiency in language, arithmetic, and social experiences illustrates "uneven" development. Gifted children, upon examination, have been found less uneven than normal and dull children. The differences which all children exhibit justify the belief that each individual is a unique entity with inherited and acquired mechanisms that are distinctly specific. This conclusion is based on experimental studies and is consistent with our fundamental principle that intelligence is a composite of abilities, a general ability, rather than a specific ability.¹³

Do Gifted Children Use Their Intelligence for Antisocial Ends?—Occasionally an adolescent of high intelligence shows degenerate behavior. Because the newspaper publicity stresses the superior quality of the culprit's mind, the erroneous inference is sometimes made that gifted children are likely to use their ability to circumvent adult law. Every test yet devised secured results that contradict this assumption. Statistical inquiry among delinquents rarely shows that more than 7 per cent of them are above the average, that is, possessed of an I.Q. above 110. The investigators who studied 1,000 gifted children under the guidance of Terman believe that the intellectually superior child of nine reaches a character level corresponding roughly to that attained by unselected children of fourteen.¹⁴ The true character level of these children, though decidedly above nine, is probably below fourteen because most of the tests gauged knowledge of the right rather than actual right living.

Are Delinquents Generally Mentally Defective?—We have long been led to believe that 60 to 75 per cent of the delinquent and criminal classes are made up of feeble-minded.

¹³ Terman and others, *op. cit.*

¹⁴ *Ibid.*

Classification by tests rather than personal opinion reveals gross exaggeration in these estimates. The distribution of intelligence quotients of delinquent girls in a reformatory in New England was tabulated by an investigator.¹⁵ The accompanying graph gives an impression that is blacker than the actual facts. Those with I.Q.'s from 50 to 70 are listed as defective by school and test standards but are usually not

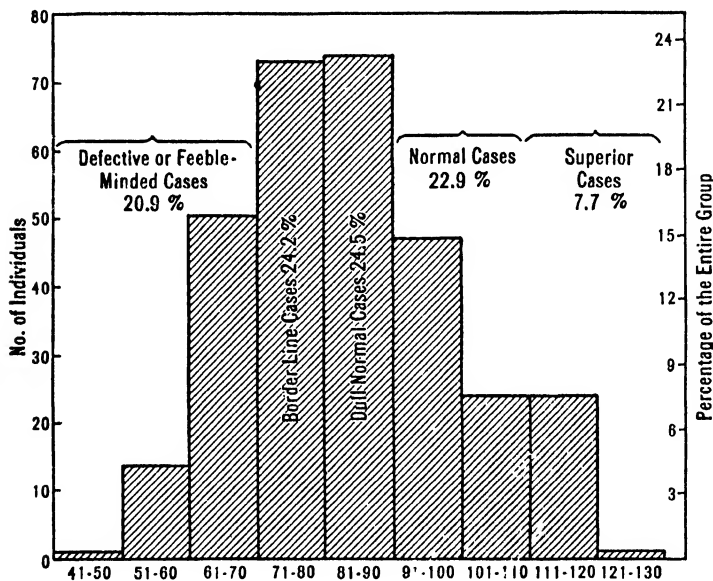


FIG. 15. DISTRIBUTION OF I.Q.'S AMONG DELINQUENTS

so regarded in actual social and vocational life. Many of this group are self-supporting. About one-half, 48.7 per cent of the girls were distinctly of the dull and borderline cases.

Healy¹⁶ found that the distribution of the Stanford-Binet I.Q.'s of 1,212 juvenile repeated offenders corresponded to the

¹⁵ P. B. Battey, "Psychiatric Survey of the Connecticut State Prison," *Monthly Record Press*, Hartford, Conn., 1920. Cited in W. F. Dearborn, *Intelligence Tests*, p. 255.

¹⁶ William Healy, "The Practical Value of the Scientific Study of Juvenile Delinquents," U. S. Depart. of Labor, Children's Bureau Publication, No. 92, 1922.

one we have just cited. Cyril Burt's study yielded a somewhat similar distribution of I.Q.'s among delinquents in London schools. His group had 7 per cent I.Q.'s below 70; 20 per cent were retarded; nearly 50 per cent were below average; about 25 per cent approximate the average; 2 per cent were slightly above average. Burt concludes,¹⁷ "The majority of juvenile delinquents thus appear to be technically 'backward' but not technically defective." While there is a relationship between intelligence and delinquency, it is not as vital as was generally supposed and probably less important as a causal factor than vicious environmental influences.

Delinquency seems prevalent in that twilight zone of intelligence which is below normality and above feeble-mindedness. Most juvenile delinquents are average and usually ill-adjusted in the classes where they happen to be. With longer and better adapted schooling, they would undoubtedly test higher because test scores are determined in some measure by school experience. These pupils have enough mentality to resent continued association with children who are their chronological inferiors and their intellectual superiors. The need of junior vocational schools and continuation schools for this type of pupil is immediate and acute.

Intelligence Test and Social Determinism.—The ardent enthusiasm of new converts has become proverbial. The zeal displayed by the leaders in the new movement for measurement of intelligence often led them to extravagant claims for their new instruments and to dogmatism altogether out of keeping with the scientific spirit. They drew sharp lines between innate and acquired ability with an assurance that gave the trained biologist many a jolt; they ascribed to intelligence quotients the constancy that the physicist does not assume in the physical world; they circumscribed social classes and races and formulated for each a distinct destiny. Intelligence tests were to become the final arbiters in human life and were to set up an aristocracy of ability as just and as competent as the best democracy.

¹⁷ Cyril Burt, *Mental and Scholastic Tests* (King & Son, London, 1921).

By the use of the Army Alpha Intelligence Tests it was demonstrated that recent immigrants tested low; that immigrants of many years' residence in America had decidedly higher I.Q.'s; that southern Negroes had lower I.Q.'s than their northern brothers; that children of parents low in the intelligence scale had lower I.Q.'s than children of parents of unmistakably higher intellectual attainments. Startling conclusions were extracted from these facts: the immigrants of a decade or two ago came from better stock than their recent successors. Our immigrant quota law was prompted in no small measure by this inference. The fact that scores obtained by the use of intelligence tests are affected to an appreciable degree by the extent of one's schooling, and mastery of the language was apparently considered irrelevant.

The northern Negro was declared superior to the southern Negro. When it was shown that the former attended school two and three years longer, the makers of tests insisted that here is further proof of their contention—the southern Negro was so deficient in intelligence that he could not survive the fourth grade. Yet it was well known throughout the land that educational costs in the south were excessively low; that professional standards for teachers were lower; that the abbreviated school year and the absence of machinery for the enforcement of compulsory attendance were quite common; and that the segregated schools for colored children were conducted on lower planes than similar schools for whites. The admittedly superior schooling which the northern Negro received never entered into the explanation of the discrepancies in the distribution of intelligence scores of the two racially similar groups.

The higher intelligence ratings obtained by the children of the professional classes were seized upon as proof that the children of laborers are generally destined for the trades. Inheritance became the determining mechanism. The spiritual stimulus and the educational guidance, that enlightened parents provide, were completely discounted. Nature was in the saddle and nurture played a distinctly secondary rôle. But since we have no reliable means of distinguishing behavior

due to inherited patterns, from behavior due to acquired patterns, who can say to-day whether inheritance or environment exercises the dominant part in conditioning our development?

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QUESTIONS FOR DISCUSSION

1. List ten forms of behavior that indicate the quality of intelligence. List six that do not. Justify your choice.
2. Select twelve typical vocations. Arrange these in an ascending series, according to the degree of intelligence required. Next to each, list a few qualities, other than intelligence, that insure success.
3. Name three vocations in which a high level of intelligence would be a distinct handicap. Explain how intelligence and the job are in conflict.

4. Explain and illustrate: A.Q. (achievement quotient), E.Q. (educational quotient).

5. In what ways can properly administered tests be of service to the following institutions:

- (a) A private business school
- (b) A large department store employing 300 young people under eighteen and having a large labor turnover in this group
- (c) An orphanage
- (d) A custodial home for children who are unmanageable at home or guilty of minor delinquencies
- (e) A trade school that admits graduates of the elementary schools

6. Assume that you are in charge of 120 children in the fourth grade and 131 in the fifth grade. Indicate the steps you would take to secure homogeneous grouping. Justify your procedure.

7. Clinical histories show that children of superior intelligence are sometimes reported by their teachers as indolent, mischievous, and indifferent, but that there is a marked improvement in both conduct and attitude when these pupils are advanced to higher grades. What diagnosis do you make of their misbehavior? Why is advancement advisable in these cases? What is the value of punishment that demotes the child for misbehavior?

8. We are told that many respected scholars, like Darwin, were regarded as mediocre in their youth by their teachers. Does this prove that these people were retarded in youth? That they had ability in fields not taught in school? That they had an abundance of intelligence and, therefore, developed their own interests? That they were superior youngsters and, therefore, moody and different? What explanation do you offer?

9. On a retest, a child's I.Q. is twenty points higher or lower. What conditions may account for this? Think of (a) the tests; (b) the circumstances under which tests are administered; (c) possible changes in the child's life.

10. Why is the I.Q. inadequate as a sole measure for placing children in a grade? In which of these three classes will you find the youngest pupils, 5A1 (brightest), 5A2 (normal), 5A3 (slow)?

11. Account fully for the following:

(a) The dull child is generally less retarded in the school grades than the superior one

(b) Rapid promotion of superior children may produce better intellectual adjustments for them, but acute social maladjustments often follow this course

12. Assume that two groups of children have been rated by suitable intelligence tests at the age of six and again at the age of ten. Those in the first group led isolated lives, with very irregular schooling, like gypsy or canal-boat children. On the retest, the scores were distinctly lower. Those in the second group led more normal lives with normal relations in and out of school; these children, on the retest, showed little change in the I.Q.

What inferences may reasonably be drawn from these facts with respect to, (a) the constancy of the I.Q.? (b) the influence of environment and schooling on the rate of development of intelligence?

What further inquiry would you institute with reference to those children in the first group who tested as high or a little higher in the second test?

PART V
EDUCATION AS MENTAL
ADJUSTMENT

B. THE ACQUISITION OF NEW FORMS OF BEHAVIOR

CHAPTER XXII

MEMORY AND HABITUATION OF NEW FORMS OF BEHAVIOR

The preceding section studied our inherited mechanisms and native capacities. But we must not assume that the individual is wholly conditioned by the factors of inheritance; his ability to make new adjustments should not be minimized. The number and variety of acquired behavior patterns that one can achieve measure his final worth in life. We turn, therefore, to a study of habit.

Scope of Habit.—Habit is the law of nature. Science is based less on demonstrable experience than on faith in the uniformity of nature. The scientist observes, at best, a limited number of cases and then makes his generalization, confident that nature will operate according to fixed patterns. Scientific research is an intelligent and persistent attempt to discover nature's fixed modes of behavior.

In human conduct, habit is all pervading. Thought as well as action flows in habitual channels. Moral attitudes become fixed and their reactions follow expected forms. Teachers of religion judge in terms of dogmas which they regard as divine revelations; teachers of ethics, in terms of intellectually perceived social relations; "good-fellows," in terms of the pagan law of pleasure. Habits are, therefore, the very garments of the soul.

Meaning of Habit.—In an earlier discussion, we observed that a conditioned reflex is an elementary habit. In its broadest sense, habit is a generic term signifying customary behavior. Habits are, therefore, not part of our inherited equipment, but rather acquired systems of conditioned reflexes that set one another off and make up a unified pattern of action.

Habits have their roots in instinctive behavior, though they

are not instincts. The habits or techniques developed in learning to play an instrument are related to instincts of self-expression; habits or skills acquired in a sport are probably based on the craving for companionship; the acquisition of table manners and other social habits is quickened by our craving for approbation. Habits are, therefore, based on the native reflex arc which is the beginning of all human conduct.

Explicit habits are those that persist and insure habitual responses as they are needed. *Implicit* habits also persist but the habitual response cannot be produced at will at any particular moment. Our explicit habits enable us to multiply, to spell the common words, and to carry on the routine of the day. Implicit habits are temporarily beyond recall. The child who has dropped his practice finds difficulty in fingering the violin strings; the teacher who has not taught geography for a number of semesters lacks confidence in teaching the details of Asia. Implicit habits can be reestablished with decidedly less effort than is required to develop a new explicit habit.

Ready habituation of experience is no evidence of limited intelligence. On the contrary, habit formation and intelligence are closely related. We must regard habit, not as a lapse in intelligence but merely as a lapse in the consciousness of certain reactions. Since a habit is a form of adaptiveness, and intelligence is one's capacity to make ready and effective adaptations, the more intelligent individuals acquire and apply their round of habits more effectively.

One of the distinguishing characteristics of habit is its capacity to prompt conduct that is very specific, never general. One may be neat in dress but careless in the care of his personal effects; one may be accurate in his specialty but given to looseness of thought and expression in other relations; one may be well-balanced in his attitude towards personal health but he may suffer exaggerated concern about the well-being of his family. Improvement in the power to think in history does not insure more effective thinking in linguistics nor in scientific situations. Habits are not transferred to

experiences that are different. The skills or techniques acquired in one experience are carried over to another only in proportion to the number of identical elements possessed by both. The habits of thought developed in the study of philosophy may function in a theological discussion but these same habits will render us little service in the solution of a mathematical problem. In the study of formal discipline, the student will find a more extended discussion of the transference of habit.

Significance of Habit.—Action that has been reduced to the plane of habit is (a) more rapid, (b) more accurate, (c) less tiring, and (d) capable of freeing the mind for new adjustments while insuring correct reactions in our daily routine. The pupil who is learning to play the piano takes an irritatingly long time before she strikes the right key. It is comforting to the auditor to know that the child will tire soon because her every movement is directed by consciousness. As the months roll by, her reactions become more rapid and more accurate; she can now practice for longer periods without becoming tired because such matters as body posture, hand position, and location of the keys are performed, seemingly, without conscious direction. Occasionally, the child even permits her mind to wander to other things, confident that the hands will function correctly.

The same significant characteristics of habit may readily be observed in the classroom. When the child must think before arriving at the answer to such questions as $3 \times ? = 27$, $? \times 9 = 36$, and $5 \times 7 = ?$, the responses are slow, often incorrect; furthermore, the class is easily tired by this drill. In all formal subjects—spelling, penmanship, combinations in arithmetic, phonetics, and the like—drills are given to insure the functioning of these experiences as habit so that the control over these matters will be instantaneous, accurate, and less fatiguing.

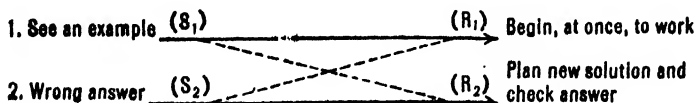
Were it not for the phenomenon of habit formation, all thought would go to the petty business of the day—dressing, washing, eating, and avoidance of danger. We could not learn to speak, to read, to write, or to master the simplest

means of communication. Because habit holds the routine activities in captivity, consciousness is freed to achieve new and finer adjustments and the horizon of human life is widened almost beyond conception.

Limitations of Habit Formation.—Habit formation has also a sinister aspect. Habits are easily contracted, especially in youth when the nervous patterns are comparatively few. Bad habits may be acquired from whose thralldom escape is difficult. With the coming of mature reason, habits already acquired are evaluated, but, by this time, most behavior has become habituated.

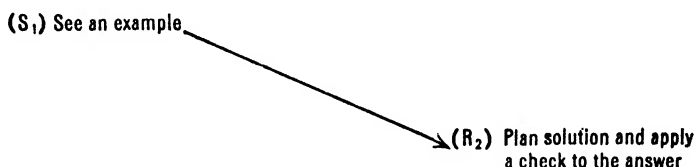
Habit often deadens sensibilities and thus lessens the normal emotional tones of experience. The country toiler is often blind to the beauty of his environment; his city cousin is alive to every change of shade and color. The professional charity worker listens to an applicant's tale and picks out the facts necessary to answer the questions on a printed form, while the visitor, who rarely comes so close to misery, feels his throat tightening and his eyes becoming moist. Workers in hazardous trades show little concern at the serious injuries of their fellow workers. Leaders in the movement for social reform have been thwarted by the indifference of those whose salvation they seek; social betterment must often wait until the deadening effect of custom is broken.

Neural Basis of Habit.—There are two distinct stages in the development of a habit, *acquisition* and *fixation*. In the former, "we establish new paths of conduction." We may find that pupils have an annoying habit of beginning to work the moment an arithmetical problem is presented. As a result, their solutions are often needlessly wrong. These children are then required to rework the problem by making a plan and applying a check to the answer. Diagrammatically, their practices may be represented thus,



Since these two experiences are closely related, they are connected by dotted lines. The symbols S and R represent stimulus and response, respectively.

Again and again the teacher patiently traces the wrong answer to the child's lack of planning and his failure to apply a check to his answer. The unpleasantness that follows the realization that the answers are repeatedly wrong, coupled with the teacher's advice to suspend solution pending the formulation of a plan, tend to weaken the behavior pattern $R_1 \longrightarrow S_1$. Little by little a new behavior pattern is formed and a new reaction is acquired, which we may represent, thus,



What has happened? A new pattern of action is established. The theory commonly held is that,¹ "The actual change of path, in every case, depends upon changes in the condition of the synapses." Some synapses are less resistant than others and give way readily. Sometimes an impulse is so strong that it breaks through a number of synapses and a new pathway thus results. The child who is careless at street crossings may be so shaken by a narrow escape that ever afterwards he looks carefully before venturing across a highway.

Fixation refers to the strengthening of the newly acquired synaptic connections so that the new pathway thus formed may become permanent. We have little or no evidence for the theory that habits are evolved only when a lower center, like the spinal cord, takes over the control of an action heretofore the concern of the higher center, the cerebrum.

There is little difference between the explanation of habit given by the orthodox psychologists and that sponsored by the behaviorists. James accounts for habit by the plasticity

¹ Howard C. Warren, *Elements of Human Psychology* (Houghton Mifflin Co., 1922), p. 255.

of the nervous system and the formation of permanent neural paths, that is, "The possession of a nervous system weak enough to yield to influences but strong enough not to yield at once." Behavior psychology insists that repeated exercise leads to the establishment of new neural patterns which results in habitual forms of response. In the final analysis the difference is more verbal than factual.

Breaking Bad Habits.—Strictly speaking, one cannot rid one's nervous system of the impress of any habit. There is only one avenue of approach to the task of breaking a bad habit: acquire a more desirable habit to replace the undesirable one, which will weaken through continued disuse. The problem is, therefore, one of replacement, rather than of displacement. The child who shows the all too common practice of beginning his composition the moment the topic is announced or his solution of an example with the reading of the last word, does not proceed very far. After the initial impulse has worn itself out, he is left stranded high and dry, without objective or plan. The habit of aimless work is bad, but not much need be said about it. Teach the class a new mode of thought in composition; after the subject is announced, each pupil should ask the following questions before proceeding: "What facts concerning this subject do I know? How shall I group them? What is an effective introductory sentence?" Similarly, in problem solving in arithmetic, children should be required to outline the conditions of the problem under the captions, *Given* and *Find*; to indicate a plan; and to estimate the answer. Insistence on these preliminaries inculcates habits of planned work which supplant the objectionable habit of aimlessness. Since new habits have an explosive power over old ones, the more desirable habits that children are led to acquire may, with reasonable assurance, supplant their less desirable predecessors.

An emotional attitude may retard or accelerate the acquisition of a desired habit. When children are convinced that slovenliness in written work may be a serious handicap, or that incorrect posture may lead to body ailments, they exert every effort in the right direction. As was shown, a single

experience that comes as a shock may successfully initiate a new habit. Some speech teachers compel their lisping boys of sixteen to lisp or their stammerers to stammer in the hope that these students will realize, as never before, the social disabilities of speech defects. In punishment by saturation, the offender is invited to continue his offense. Thus, the child given to talking at the most inopportune time, is invited to complete what he was telling his classmate while teacher and class wait. For some children such an experience is so intensely disagreeable that it accomplishes what earnest pleas and even severe penalties may have failed to do. Punishment by saturation may develop in the child habits of inhibiting such petty but none the less annoying forms of misconduct. These situations may be sufficiently disagreeable to provoke correct speech or proper conduct. As habits of speaking without lisping or stammering develop, old speech habits are not eliminated; they are merely dimmed but they remain coexistent with the new habits. The old habits are now the recessive and the new are the dominant patterns of action.

The formulation of rules for breaking undesirable habits has been a favorite task among the older psychologists who followed James. Their simple and helpful advice is here summed up.

(1) Force the right action. Preaching and mere resolving are futile. Habits lead to action; the only method of counteracting action is through action. Less resolution and more execution is the law of habit formation.

(2) The individual must decide on a vigorous initiative. He must burden himself with obligations for failure to live up to his resolution. James cites an extreme instance of the man who advertised a reward to any one who found him in a public ale house.

(3) Beware of the exception. The individual must not indulge in such self-deceptions as, "This time doesn't count," "Beginning with next Monday I shall. . . ." The exception restimulates a nervous pattern ready to respond at a time when one is most eager to dim it through disuse. When helping children to rid themselves of such undesirable habits as

chewing gum, throwing papers about the room, and biting finger nails, general reminders, in the form of badges, ribbons, buttons, or mottoes are often very helpful.

An old religious story tells of a large Record Book in which the good and the bad of each life are entered daily by a Recording Angel. What the old tale lacks in theology it makes up in psychology because it is a figurative description of a stern reality. Each individual is his own Recording Angel; each one's nervous system is his Record Book. No more faithful system of record keeping has ever been devised.

(4) Confidence in one's ability to succeed is absolutely essential. Without the feeling that one has the power to resist the old habit, he is chained to it forever.

(5) The methods advocated to weaken the hold of instinct—disuse, punishment, substitution and guidance, sublimation—-are usually effective in dealing with undesirable habits. The relative values of these methods are unchanged when used to influence habitual behavior. The practice of substitution and guidance is usually most effective because it directs an impulse already present to socially approved ends. A child whose love for chance leads to gambling may be helped by active participation in properly supervised athletics. Here he finds situations well designed to satisfy—in ways that are socially approved—his gambler's love of chance.

Important Applications to Teaching.—All school subjects must be regarded as instruments for inculcating suitable stocks of habits. A school study may yield three sets of habits, (1) mechanical habits, (2) subject matter habits, and (3) mental habits. Upon the ability of the teacher to analyze each of these groups into its component, specific habits, depends much of her professional effectiveness. Each of these specific habits becomes a specific skill. Since habits are not generalized, we must identify the skills of each subject and help children to acquire them.

Taking the subject of arithmetic for illustration, we have the following partial list of habits:

(1) *Mechanical habits*: arrangement of the paper; neatness; systematic presentation; proper labeling of key numbers;

placing figures in proper place; placing decimal point under decimal point; etc.

(2) *Subject habits*: the basic combinations like $6 \times 8 = ?$ $? + 9 = 15$; the facts about denominate numbers; how to perform any of the four fundamental operations with whole numbers, common fractions and decimal fractions; checking the answer; etc.

(3) *Mental habits*: concentration; first determining on an objective (what the problem asks); making a plan before doing any computation; critically examining the answer; asking one's self if it seems reasonable; etc.

In learning such a process as multiplication by three digits, a child must acquire the following new habits or techniques or skills:

(a) the arrangement of the three partial products

(b) what to do when there are ciphers in the multiplicand, thus $8,004 \times 126$

(c) what to do when there are terminal ciphers in the multiplicand, thus $8,420 \times 126$

(d) what to do when there are terminal ciphers in the multiplier, thus, $8,124 \times 180$

(e) what to do when there are terminal ciphers in both multiplicand and multiplier, thus $8,120 \times 180$ or $8,600 \times 180$ or $8,640 \times 700$

(f) what to do when there are ciphers, not terminal, in the multiplier, thus $8,642 \times 204$ or $8,642 \times 2,004$

(g) what to do when there are non-terminal ciphers in both multiplier and multiplicand, thus $8,042 \times 408$

Skillful teaching arranges these habits in a graded series and focuses attention on one at a time. Much of the difficulty experienced by children in learning a formal subject like arithmetic has its origin in the failure of the teacher to evolve suitable gradation which introduces only one new element at a time. Before deciding on the curriculum material to be taught in any semester, the teacher must list the minimal skills or habits she wishes to implant. These become, not the materials to be taught directly, but rather an inner skele-

ton which must be clothed with socially significant content. The list of minimal skills to be acquired need never be exhibited to the children. It is formulated by the teacher and becomes for the teacher both a guide of what to teach and a measure of the pupils' progress. In the chapters dealing with the various recitation modes, we shall present lessons which aim to develop various skills while the children are concerned with problems and projects—large units of purposeful experience.

Habit and Memory.—*Basic Terms Defined.*—Habit is, essentially, efficient functioning of memory. It gives evidence of the inherent dual capacity of the nervous system to retain those mental patterns we have experienced and to set these off at the appropriate stimulus. To the behaviorists, memory refers to the retention of a function as an explicit habit despite the lapse of practice periods. Memory is, therefore, our knowledge of a past event or fact, accompanied by an unmistakable conviction that we have actually had that experience before. Memory may apply to experience relived mentally, as well as to the revival of old percepts, concepts, judgments, and emotions.

The term *image* refers to reproduced sensory experience of any kind. We have auditory images of melodies heard, visual images of incidents seen, or kinæsthetic images of activities performed. A *percept* is a mental picture of what is at the moment stimulating the senses. Thus we have an auditory percept of the approaching footsteps we now hear, a visual percept of the pen with which we are now writing or a kinæsthetic percept of a new calisthenic movement we are now learning. The sensory elements in percepts are, for any individual, always more vivid than images; as a rule, they are involuntary mental products. Images are less vivid and, except for the reverie, are usually brought back voluntarily.

Different forms of memory are recognized, depending upon either (a) the effort required to achieve successful recall or (b) the nature of the association among the component ideas.

Recollection vs. Remembrance.—Recollection is that aspect

of memory that demands considerable effort, and is, therefore, entirely voluntary. Much of the memory required in ordinary classroom recitations and in study—the recall of a name, or a date, or a formula, or a series of facts—is recollection. In this form of recall old facts appear to be “dragged into consciousness.”

Remembrance, on the contrary, is that state of recall in which facts follow one another easily and quickly. Without any appreciable effort, images after images come and go. This recall is almost automatic and is characteristic of habit or of a reverie. In remembrance there is distinct satisfaction in reliving the past, for images seem to “leap into consciousness.”

Mechanical vs. Logical Memory.—With association of ideas as the basis of classification, we may have mechanical or verbal memory as opposed to logical memory. In the former, events are connected in the mind because they are contiguous in space or in time. It is a chance association with no rational basis. To tell the beginner in reading that the following word-pictures, “father,” “boy,” are *father* and *boy*, respectively, to tell pupils that “in the antebellum days the northern states were commercial while the southern ones were agricultural,” or to ask them to learn, “The products of Brazil are coffee, cocoa, fine woods, tar, and rubber,” is to teach by appealing to mechanical or verbal memory.

But when facts are grouped because of inherent likenesses or differences, or because of an underlying relationship of cause and effect, the appeal is to the logical memory. Teaching spelling on a phonetic basis, thus, *could*, *would* and *should*; reviewing conditions of climate and topography and then leading pupils to infer that the major economic interests of the north were industrial and commercial, while those of the south were agricultural; helping children to infer the products of Brazil from their knowledge of the resources and the occupations of the country—these are illustrations of teaching through logical association of facts. Only as we stress logical memory, do we succeed in educating rather than in training our pupils.

Skillful organization of subject matter is achieved by grouping facts on the basis of their significant similarity, or their differences or their cause and effect relationship. The more logical the association, the greater is the aid to remembrance and the more do we eliminate the element of drudgery in learning.

Memory in Children and in Adults.—The popular belief is that in youth memory is more retentive and insures readier recall than in adult life. Investigations reveal facts that lead to conclusions surprisingly different. During the mature years, *immediate* memory is better than during youth; memory improves gradually until maturity and then remains fairly constant until senescence, when degeneration frequently sets in; facts learned during childhood last longer than those acquired in the mature period; adults acquire associations of a mechanical nature better than children but children retain them longer; in maturity, logical associations are acquired more rapidly and are retained much longer than in youth.

A child will often learn a poem or a list of names in less time and retain the data longer than an adult because the latter, having no interest in the task, approaches it with a hostile mind-set. In experimental undertakings, the mature person is interested in the outcome and applies himself to learning the assignment. While the mature person remembers better, he also forgets more than a child of school age. Analysis reveals the fact that the mature mind remembers and forgets according to its interests.

For successful learning of arbitrary but important facts, overlearning or overdrill is essential. The pupil must continue learning to spell *judgment, separate, believe, and receive* beyond the point where mastery of the letters first makes itself manifest. Reasonable overlearning gives the mind a greater surety of control and thus produces a safe margin for forgetting.

The Nature of Memory.—1. *Memory or Memories?*—Teachers, more than others, must guard against the conception of a *memory*, a special storehouse in which old experiences

are kept, well arranged in the orderly mind, or disarranged in the muddled mind. We have *memories*, not a memory; mechanisms for the reimagining of old experiences, not store-houses of the actual images themselves. The mind has as many memories of an event as phases of its sensory and motor mechanism that were active during the occurrence. A child who knows the spelling of the word *business* has a visual memory of it, an auditory memory of it, and, surely, a kinæsthetic memory of it—at least three distinct memories. Those who learn science in a laboratory remember the structure of a cell visually; they saw it; verbally, they heard it explained; kinæsthetically, they drew it; again, at least three memories. Each memory makes its contribution to a single fused pattern which gives us a unified image or memory of a past event. A whole experience is, therefore, not stored away in any one center. The word *memory* is an abbreviation for the longer expression, *the sum total of the memories*.

This conception of memories explains common mental defects. In aphasia there may be cessation of function of one or more memories. In visual aphasia, the patient sees a word but cannot recognize it; when he hears it, he knows it beyond doubt. The victim of auditory aphasia knows the word he sees but cannot recognize it when it is spoken to him. In another form of aphasia, the printed word is recognized but cannot be produced. The patient looks at *y-o-u* and says *he*, then shakes his head negatively as he hears himself producing the wrong word-sound. He gives evidence that he knows the meaning of *y-o-u*, but he cannot coördinate the speech apparatus to sound the word. He has forgotten how to say, *you*. If he had a *memory* rather than *memories*, such phenomena would not occur; he would either fail in all aspects of recall or have full mastery of the word.

Our memories are not equally effective. Some learn mathematics best by seeing the analysis clearly set forth on the page, others by hearing the succession of logical steps in the demonstrations, still others by writing out the successive operations in a solution. The older psychology taught that some are "visuals," that is, visually minded, and can learn

best by seeing; that others are "audiles" or ear-minded; that most were motor-minded. There seems little basis for such a classification. In the light of recent knowledge, it is safer to say that most people are of mixed sense type; that sensorisensitivity in any one person changes according to the experience—he may be visual-minded in the social sciences, motor-minded in language, and auditory-minded in mathematics; that in the earliest years we are predominantly auditory-minded, later, predominantly visual-minded, and in adolescence decidedly motor-minded. These are tentative conclusions for the proof of which we need a richer basis of fact than is now available.

2. *Can Retentive Power Be Increased?*—Many traditional school practices sprang from a conviction that retentive power can be increased. It was argued that since exercise and nutrition increase bodily vigor, much memorizing will increase retentive power.

In every perceptual experience, a stimulation is taken up by a sense organ and conveyed along well defined paths to certain centers in the nervous system. The stimulation is transmitted along neurones and from synapse to synapse by a series of chemical changes. In recalling a perceptual experience, we must in some way restimulate this path, this particular pattern of response in the neurones and synapses. The power to retain, neurologically, it is commonly assumed, depends upon the readiness of the neurones to receive impressions and of the synapses to establish the necessary changes or paths. On the same assumption, some neurones and synapses will receive stimulation very easily and will reproduce a desired pattern quickly; others receive readily but reproduce the pattern reluctantly; still others are slow to receive and slower to reproduce; a fourth may be hesitant to receive and quick to reproduce. Some nervous systems seem to have jelly-like properties, while others are more wax-like. The Talmud speaks of four types of students: the sponges who absorb everything; the funnels who retain nothing; the sieves who "catch the illustrations and let the main arguments slip by"; the winnows who "fan away the illus-

trations" and hold for all time the fundamental principles.

Since retention and recall are essentially physiologic, increasing retentive power resolves itself into changing one's neural characteristics—a task manifestly impossible. The degree of retentiveness for each individual is, in all probability, heritable, and, therefore, its increase is impossible. We do not mean, of course, that we use all the memory power we have. Effective methods of study teach children how to use to the very maximum what memory power they possess. In the succeeding chapters we shall analyze the laws of learning in the hope of discovering the wisest use that one can make of his powers of retention and recall.

Since memory is essentially physiologic, there is a marked relationship between health and retention. Promote bodily vigor and you improve those conditions that enhance retention and recall. One always remembers better the experiences of his most rested hours than those which occurred during fatigue. The horrible nightmares of fever-ridden days are mercifully soon forgotten; the joys of our vacation days, happily, stay with us much longer.

This close relationship between health and memory has its applications in the classrooms. Drill lessons should be short and not held towards the close of the morning or the afternoon session. An arithmetic lesson of ninety minutes with a sixth-year class wastes about forty-five minutes. A study period set for the last half hour of the day is a convenience to the teacher but gives the pupils little for their labor. Class tests should be given early in the day and not all on the same day. Frequently school custom sets aside the last Friday of the month for tests. After the first examination the children are tired and their control over their information is seriously reduced. Why cannot the monthly tests be scattered over the five days of the last week in each school month?

Unreliable evidence of increased retentivity. Individuals often assert that they increased their retentiveness by daily memorization of poetry, of telephone numbers, of names in geography, and the like. The conclusion concerning improve-

ment in ability to remember is, to these people, a purely subjective impression. James and a group of psychologists experimented upon themselves to ascertain whether practice in memorizing poetry brings greater power to remember. All agreed that as the days wore on, they memorized fewer lines in the set time. In the initial stage of the experiment, each man set to work with avidity, but after two weeks of the daily grind, all lost interest and, therefore, retarded their learning rates.

Experienced actors of repute assert that they learn their parts in less time and remember them better to-day than they did as novices. Inquiry reveals that in the early part of their careers they repeated the script over and over again, until, by dint of rigorous drill, they learned it; but experience taught them to visualize the action of the play, to learn the ideas that they must contribute in each scene, and, finally, to clothe these ideas in the author's words. Here, clearly, is a more rational method of learning supplanting a purely mechanical one, but no evidence of improved memory power. Who cannot profit by more intelligent methods of study?

Not only is native retentive power fixed at birth, but such memory power as the gifted possess is usually highly specialized. Some can perform prodigious memory feats with numbers but not with language; those who can remember sixty lines of metrical poetry after one reading cannot repeat the performance with prose; some show remarkable memory for names but not for faces, others for faces but not for names.

Most commercialized memory courses teach their victims how to live with more aspects of an experience than they usually do. The president of a corporation, tired after a restless night, is embarrassed by his failure to remember the names of some of his important stockholders. He is discouraged and concludes either that he has a "bad memory" or that his memory is failing him. He subscribes for memory lessons. These teach him, with each introduction to a new person, to say the name aloud and to stress the initial letter. After that, he must see the name of the new acquaintance, in large letters of gold and then write it in the

air, with his finger. Heretofore, when the name was mentioned, he directed all attention to the man's business; now he attends, very intently, to the new name and gives himself better mastery of it. In later lessons, he is taught to read meaning into the name, to associate it with some characteristic of the person whose acquaintance he is making, thus, Mr. Shaw, short name, short man; Mr. Tan, short name, tall man; Mr. Leffingwell, long name, tall man; Mr. Leffingwell, contrary to name, looks dyspeptic. The bank president, who is well informed in matters of finance, may fall an easy victim of the memory course. His new mental life gives him readier control of names and he writes an enthusiastic endorsement of the memory course, which any intelligent person who has read an elementary text in psychology can formulate just as effectively for himself.

3. *How Long Do We Remember?*—The memory of an experience is probably coexistent with life itself. Every idea received, every conclusion formulated, and every emotion felt, make an impress upon the nervous system and change the individual neurally as well as mentally. True, we cannot, at will, always revive the memory of an experience, but its registration, however dimmed, probably is never completely erased.

Evidence, seemingly reliable, has established the fact that the language of youth, apparently long forgotten, is sometimes employed in the delirium of the fever-racked patient. Clergymen testify that Americanized foreigners, praying before the end, often lapse into their native language and use it fluently and accurately. People saved from imminent death often tell of a panorama of events, long past, that flitted through their minds—scenes of childhood or visions of boyhood, friends not seen or thought of for a quarter of a century. In the even tenor of daily life, infrequently recalled memories seem to sink into the background of the mind, where they remain until they are routed out by experiences of sufficient intensity.

The psychological significance of repressions is based on the belief that an experience to which we have reacted thoroughly

remains a potent force in the mind, even though, consciously, we seem to have lost control of it. Fears, likes, and aversions of childhood persist and give color to our present reactions. A terrifying snake story may account for an adult's unwillingness to walk in the grass at night. The story may be forgotten, but it nevertheless determines the behavior of the individual all his life. Similarly, fear of darkness, unwillingness to go swimming in the dark, dislike of particular kinds of food, reluctance to make friends with particular types of people—all these may be conditioned reactions having their origin in circumstances no longer in the realm of conscious control.

Forgetting. A good mind forgets as well as remembers. Forgetting is a great aid in the economy of thought. What if we remembered every insignificant detail of our major experiences or every disagreeable consequence? Our minds would either be so encumbered with unrelated images that further thinking would be impossible or so beset with inhibitions born of discouragement that no undertaking could be brought to a successful conclusion. Forgetting begins as soon as experiences are completed, in all likelihood, while the experience is going on. Investigations lead to the conclusion that about half of the events of the day are forgotten by bedtime.²

There is, generally, a decidedly positive correlation between speed of learning and retention. As a rule, the fastest learners remember most of what they learn and for the longest time; similarly, the slowest learners remember least and for the shortest time. While this seems to be true in most cases, we must make due allowance for the learning idiosyncrasies of any given individual. Many pupils have become so accustomed to slow reading, slow analysis, and slow selective judgment that when they accelerate their rate of work, they fail to carry a line of thought to its natural end.

How Shall We Help the Child to Remember?—Without guidance few children will learn for themselves how to make

² H. Ebbinghaus, *Memory* (1885). Translated by Ruger and Busenius (Teachers College, Columbia University Press, 1913).

maximum use of their retentive power. The question we ask is therefore vital. Its answer will be found in the laws of learning that are set forth in the succeeding chapters.

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ON HABIT

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QUESTIONS FOR DISCUSSION

ON HABIT

1. Differentiate the following: instinct, reflex, conditioned reflex, habit. Give, as far as possible, classroom illustrations of each.

2. Illustrate from the science you know best: science is based on the habits of nature rather than on actually proved phenomena.

3. Examine each of the following critically and state your own position in each case:

(a) "To rid yourself of a bad habit, drop it; do not discard it by degrees."

(b) Develop the habit of precision and you will be precise at all times and in all things.

(c) "Let the beginner (typist) look at the keys; after she can locate them quickly, then let her try to type without looking at the keyboard."

(d) "Let a child run until seven, and you can never catch it."

4. "The behaviorist has an explanation of habit that differs markedly from that proposed by the old associationists." Examine Watson's explanation of habit and test the accuracy of this statement.

5. Explain habit as a physiological phenomenon; as a psychological phenomenon.

6. Give an instance from personal experience in which habit was started by a shock.

7. Select (a) one school subject, and (b) a form of desirable conduct, for example, truthfulness, helpfulness, and punctuality. Illustrate in terms of each of these "a hierarchy of habits."

8. Rousseau said that the only habit to acquire is the habit to acquire no habits. A modern writer urges that we develop in children the habit to acquire habits. To what extent is each suggestion inadequate? Adequate? Give illustrations.

9. A man wants his dog to come when called. The dog delays and when he finally does come, the man strikes him. Will the dog associate the master's call with coming? Why? What advice would you give the man? If a child who does a task carelessly is punished, will he associate carelessness with punishment? What undesirable associations may the child make? How can a teacher guard against the wrong associations?

10. How would you help an adolescent rid himself of the habit of (a) smoking, (b) looking for excuses when in error, (c) procrastination, and (d) day dreaming?

11. Many students of government hold that the law of habit explains why the most critical analysis of the American Government was written by Bryce, an Englishman, and not by an American. What is their probable line of thought? Do you agree? What factors, other than habit, may explain the quality and the character of Lord Bryce's epochal treatise?

ON MEMORY

1. Make a list of the basic terms employed by the author of your textbook on psychology in his treatment of the subject of memory.

Which of these are explained in this text? Which are omitted? Can you account for the omissions, if any?

2. Give instances of (a) learning and (b) overlearning number combinations. Is the latter process to be condemned? Why?

3. Assume that you do not accept any of the statements concerning the relative efficiency of memory of adults and children. Plan an experimental inquiry of the following questions:

(a) Who has a better memory for immediate experience, a child or an adult?

(b) Who can learn Latin verbs better?

(c) Who has a better memory for a rationally associated experience?

(d) Do old people show decrease in memory power?

4. Plan an outline of a long essay to prove one of the following:

(a) Memory is essentially physiologic

(b) Our memories of an experience are as many as the senses that coöperated in learning it

(c) Most people are of mixed sensory type

(d) Evidence commonly presented to prove increase in retentive power usually reveals new and better methods of study

5. Draw up a set of suggestions, not mentioning those found in the text, suitable for use in the classroom and based on the close relationship between health and memory.

6. Analyze a line of thought like one of the following and show how significant a rôle is played by memory:

(a) Southern France is in the fruit belt of Europe; much fruit is grown; fruit is perishable; the fruit is used to make wine, a non-perishable product; much wine is exported by southern France

(b) If $\frac{2}{3}$ of my money is \$160, then $\frac{1}{3}$ of it is $\frac{1}{4}$ of \$160 or \$40, and $\frac{5}{6}$ of it, 5 times \$40, or \$200

7. Find evidence in your own mental life or in the experiences of your friends for the following:

(a) A good memory knows when to forget

(b) One may remember a childhood scene and forget an incident of the preceding day

(c) The general rule is more likely to be remembered than a specific fact

(d) Memory is specialized; we remember certain types of experience much better than others

(e) A good logical memory may be found in the person who seems to have a poor verbal memory

(f) Good memory for isolated facts like telephone numbers may be found in people who have poor logical memories

CHAPTER XXIII

THE LAWS OF LEARNING

How to Influence Memory and Quicken Habit Formation.

—A new experience is not learned until it begins to function as habit. The curve of learning is, therefore, the curve of habit-formation. In this and in the succeeding chapters of the same title, we shall study the principles that promote effective memory and quicken the formation of habits.

I. THE LAW OF INTEREST

Misconceptions Concerning Interest.—Teaching technique has long suffered from peculiar and unwarranted conceptions of interest as a pleasurable feeling aroused by an idea. At once there was set up a conflict between interest and effort because interest was regarded as the product of any practice born of a desire to please. This misconception of interest weakened teaching practice and seriously retarded improvement in methodology. The reader is advised to formulate an answer to the question, "What do I mean by interesting my pupils?" This written statement should be put aside and examined critically at the conclusion of our discussion.

Interest vs. Effort.—An age-long dispute exists in education between the proponents of the effort and of the interest school in education. The former, the older, urge that since school is essentially a preparation for life, school work must be conducted in the uncompromising spirit of life. Stern and unrelenting discipline and rigorous tasks must prevail in the classroom lest life's future battles find our pupils unprepared. The interest school asserts that the school is a participation in life as well as a preparation for it; hence, not drudgery but joy must fill the child's day. The outcome of this con-

trovery is important for it determines, to the very last degree, the spirit of education. Let us, therefore, examine critically the points at issue.

The Position of the Interest School.—The interest school maintains that interest is a pleasant emotional tone of consciousness. It further maintains that little can be accomplished by forcing the child. Without spontaneity there is no self-expression of individual capacities. With interest as the teacher's aim, a sympathetic attitude towards the child is assured. If pupils work because they are forced, they gradually become dependent on outside pressure. There can, therefore, be no element of permanence in such training. The effort theory is psychologically false because without interest as a motive no useful expression of self-activity is possible. It must be condemned on moral grounds, for it encourages deception: pupils pretend to be at work but their thoughts are elsewhere. The effort school is contradictory because it really substitutes one interest for another, one that is indirect, negative, and static for one that is direct, positive, and dynamic. In effort education, the child works from a sense of fear and is thus trained to respond mechanically to a blind sense of imposed duty.

The Position of the Effort School.—The followers of the effort school persistently ask, "Who will sweeten life's disagreeable demands out there?" The child must be accustomed to the bitter, they argue; he must develop courage in the face of obstacles, for forewarned is forearmed. The interest educators, by their practice of sugarcoating the bitter, remove the difficulties, the very blessings of heaven, that lie in the child's path. The results are obvious; they weaken and demoralize. The followers of this school argue further that interest is a delusion and a snare. The teacher may for a time present only what is pleasant and simple, but the inherent difficulties of school studies cannot be avoided. When finally they do come, the child is unprepared, lacking in the concentration and the courage necessary to meet and to conquer a difficulty; he is left stranded, high and dry, waiting for the flood tide of interest to carry him to a solution. The

effort theory concludes that school work must be so planned as to call for all of the pupil's energy; that school discipline must be so severe that it teaches the eternal lesson of submission to authority—in school, the authority of the teacher; at home, the authority of parents; in life, the authority of one's duties.

Misconceptions and Limitations in the Two Schools.—

1. Each school is so concerned with its condemnation of its adversary that it has little thought left for a clear conception of the meaning and nature of interest. Each side is critical of the other and is, to that extent, exerting a salutary effect. Both fail utterly to understand that interest and effort are not mutually exclusive; on the contrary, one is the inevitable consequence of the other.

2. Nor do the contestants in what Dewey calls an "educational lawsuit," understand that interest is a motive force that actuates the pupil from within, never a stimulus from without. Those who think that to interest is to sugar-coat, relate interest to subject matter. Interest, to them, is a fictitious process through which teachers delude children by concealing less pleasant aspects of an experience. The controlling question in both schools seems to be concerned with how to present knowledge, not with how to evoke the many inner drives that really actuate all children in their normal relations of life.

3. The effort school assumes that to interest is to simplify. In a measure the very opposite is true: render a task easy, and you kill interest. We may explain the formation of river and lake systems by asking children to imagine mountains in chains and mountains in clusters. A number of partly opened books, standing with the back pointing upward, may aid some children. A few pantomimic motions of the hands will help the exposition: the melting snows run down the mountain sides; if the mountains are in clusters, the water is caught in the basinlike formations and lakes result; if the mountains are run in chains, they form a watershed, and river systems are started. A diagram on the blackboard or a few appropriate pictures may give a final touch to the lesson. But through-

out, the children are not interested. They understand, but they will exert only a minimum of effort.

Let us change the character of the lesson. A picture or a good model is shown and children are invited to make a section of topography that shows lake and river formations. Clay or putty must be secured, the picture or model must be studied, descriptions of the arrangement of mountains must be read with care, the topography must be modeled, and water must be poured down the mountain sides. Only those who have observed such a lesson know with what joy the children see the water gather in the miniature lakes or run off in the web-like river system. The second lesson is interesting not because it is simpler; on the contrary, it requires more attention, more reading, more scrutiny of pictures and diagrams, and richer imagery of what is to be created. It is the more interesting lesson, nevertheless, because it touches one of the mainsprings to action—desire to construct. A child in making a boat will learn the names of the various parts, will listen to the explanations of buoyancy, of center of mass, and of equilibrium. In the science class, these very facts may leave him cold. Puzzles are interesting, but, surely, not because they are easy to understand. Even kindergarten children resent aid injudiciously proffered when they are confronted by a building problem; they are interested in the situation because it is a challenge to their ability. "To make interesting, make difficult," while not altogether true, is more reasonable than "To make interesting, make simple."

4. The effort theory errs again in its assumption that will is trained by enforced application to tasks arbitrarily assigned. It insists that the child who studies the capital and the largest city of each state in the United States or the list of presidents, not because he wants to but rather because he must, is developing capacity to meet his obligations. May not keen resentment rather than will be growing in the child's mind? Increased will power is measured by self-directed effort towards a goal that seems necessary. Carry the effort theory to its logical end and we must conclude that the old prison yards in which inmates, on stone piles, made little

stones out of big rocks, were the best institutions for development of will. Were not these men doing what they did not want to do in a place that was hateful? Labor of this type deadens will, and yet it meets all the educational qualifications of the arbitrary tasks which the effortists demand.

Will is trained by the solution of problems, the argument runs. True, if the term problem refers to an experience that invites solution. Artificial situations built up by the school so that they present elements that are reasonably difficult and uninviting, are not problems. A problem is natural, urgent, impelling. Requiring children to master verb endings in Latin, or to factor twenty algebraic expressions, or to perform ten long division examples will not train in conduct. Unless the situation we present is part of the child's life and its solution seems urgent to him, it will exercise no formative influence on his behavior.

Let us illustrate with a real classroom problem. A number of children in a sixth-year class were late on the morning following the day when clocks were changed to end daylight saving for the past summer season. They gave the same excuse, "We forgot to turn the clock back." After a very short talk by the teacher, questions were asked: "Why turn the clocks ahead only to turn them back? Why are the days longer in summer? If the earth is like a sphere then why are not day and night of equal length? What difference do the seasons make in the length of day?" To answer these questions, the children had to read much, to draw, to make models, to experiment, to visit the museum, and to perform a variety of activities, all of which seemed natural and worthwhile. Here we have real problems because they began in the lives of the children and they aroused sufficient curiosity to invite solution. In the interests of clear thinking, a sharp distinction between developing will and training in submission must always be drawn.

5. A final count in the indictment of these two schools is based on the fact that both lead children to a demoralizing division of attention. The enthusiasts of the effort school fail to see that when a pupil is forced to perform a task for

which he has neither stomach nor understanding he will give only part of his attention to it—enough to do what is expected so that he may get by. But the rest of the mind wanders off to realms more pleasant. Here is a simultaneous division of effort.

The interest educators do not steer clear of this pitfall. To many of them interest is a process in which an experience is made more attractive. Through anecdotes, pictures, games, and the like, the teacher infuses interest into a lesson that would otherwise fail to hold the class. But is the attitude of the pupils toward the subject changed? While the teacher supplies the stimulation, attention is complete; when the teacher withdraws, the class turns from the subject and comes back to it only when the teacher resumes the initiative in dispelling what is seemingly tedious. Here we have a series of alternate waxing and waning of attention, attention that is successively, not simultaneously, divided, but divided for all that.

Modern Conception of Interest.—The door of the room was opened and revealed a class in perfect order. All eyes were directed to the blackboard that contained the sentences to be corrected. "See how interested they are," observed the principal. "No," replied the visitor, "only attentive." In a second room the children were more relaxed and were listening to a talk on the cities of Europe illustrated with stereopticon slides. "Surely this class is interested," insisted the principal. "Probably," came from the observer; "they are certainly entertained." The entrance of the visitors was barely noticed by the pupils of another room. They were listening to a classmate who was talking about the boundaries of Poland. When he completed his recitation, hands were raised in great number and questions were asked of the pupil and of the teacher. This was a review lesson on the exact location of the important countries of Europe. The blackboard contained the sentence on which the first pupil presented a three-minute report—"The boundaries of Poland may cause another world war." Most pupils, in their naïveté, did not see how imaginary lines around any country could

cause any trouble. All listened and nearly every one had something to ask or to explain. Evidently the question aroused doubt in the minds of many. "There," said the visitor to the principal, "is true interest."

Interest is an active attitude towards experience. It is a feeling of satisfaction accompanying self-expression. We may regard interest as a feeling of worth in experience. A class in perfect order is not necessarily interested, nor is a class that is amused, interested. Not unless the pupils react to a lesson, ask questions, look for information in their books, show eagerness to contribute something to the matter before the class, are they really interested. In all interest there is a feeling that the subject matter has value for us, either because it is materially useful or because it promises to satisfy one of our many controlling cravings.

Classification of Interests.—The interests or acquired drives of a child may be summed up under four heads: (a) Social and Religious Interests that find their satisfaction in Bible stories, imaginative literature, history, and geography; (b) Speculative and Exploring Interests upon which we base work in geography, nature study, and elementary science; (c) Reasoning and Logical Interests, that we utilize in number work, in grammar, in thought problems in all subjects; (d) Artistic, Constructive, and Expressional Interests, whose cravings give the child a keen delight in real composition, in manual activities, in drawing, and in active participation in a recitation that is a clearing house of thought and suggestion.

These four main interests form the child's natural stock, his uninvested capital. Upon their proper use and exercise depends his growth. The child is constantly seeking to invest them. Putting them to proper use, making them outgoing activities, gives him a feeling of satisfaction which is interest. Interest is hence merely an impulse functioning with a view to self-realization. True interest is always "urgent, active, and propulsive."

Characteristics of Interest.—Interest may be a means as well as an end. When we appeal to the speculative interest by introducing a geography lesson with a problem, interest

is a means. We rely upon it to hold attention until the final conclusion is reached. But when we teach geography to arouse a desire to know more about the relations among nations or when we teach history so that children will feel a real desire to discuss social and economic problems, then new interests are the results of our effort. Here interest is an end in education.

Interests differ in many ways from instincts. Our interests are acquired and are individual; instincts are inherited mechanisms and are common to the whole race. By proper guidance we increase our stock of interests but not our instincts. Interests die out with comparative ease; instincts defy, at times, the most skillful measures designed to control them.

Instincts may be regarded as wide currents that sweep us into a sea of action. Interests, on the contrary, are very narrow streams that lead us more gently to very definite destinations. Thus, we all have the instinct of curiosity; but we are not all curious about the same things. Those who are curious about the personal affairs of others have an interest in gossip; those who are curious about plants and animals have an interest in nature; those who are curious about $2 + 3$, $20 + 30$, $200 + 300$, $22 + 3$ are interested in number. Our interests, however, have their roots deep in instinctive life.

Frequently the only interest that can be aroused in a lesson is fictitious. The child who learns number combinations by arranging marbles, jacks, toothpicks, colored papers, and beads is interested in the objects, not in the number combination. In spelling bees there is decidedly more interest in the bee than in spelling. Similarly, in language games, the class is more interested in the game than in the correct language form, *It is I*. In a sense, all these devices sugarcoat information that is arbitrary and not especially pleasant. These forms of fictitious interest are not to be condemned, for they do insure attention of children who are too young to understand the intrinsic value of the knowledge itself. Although the interest is fictitious, it leads nevertheless to the acquisition

of useful skills in number manipulation, in reading, and in speaking—in the tool subjects of the curriculum. To be sure, fictitious interest should be replaced by more intrinsic forms of interest just as soon as the increasing maturity of the child makes this feasible.

There is no antithesis between interest and effort. Interest and effort are merely the two phases of the one process. Interest must lead to effort; if it does not, it degenerates into mere pleasurable states. Effort that does not spring from dynamic interest is not effort but rather drudgery. No teacher need be concerned with devising difficult tasks to give children training in capacity to work. Arouse real interest and effort flows aplenty.

Motivation and the Law of Effect.—Interest in the dynamic sense cannot be aroused unless we justify, to our pupils, the experience we are about to present to them. This justification or *motivation* can be achieved either by leading them to perceive the practical value of what is to be learned or by so presenting the new that it appeals to a basic craving in human nature.

Much of our teaching, like our discipline, is based on authority. Most children attend to the exposition and try to carry out the prescribed exercises from a sense of obedience. They rarely ask themselves, and certainly not their teacher, "Why am I expected to learn this rule about the comma?" When asked why he is inserting commas in a number of sentences, the child usually gives the same answer, "The teacher said so." If interest is an active attitude towards experience that springs from a sense of its worth, then we must reveal to the pupil, the social or individual need of this experience so that he may know definitely why his whole attention to the new lesson is requested.

An Illustration of Motivation in Grammar.—It is easy to motivate grammar lessons by basing them on the common language errors of the class. Let us assume that the adjective clause is to be taught. Will we really motivate the lesson if we follow the severely logical treatment advocated in so many books? These texts begin with, *The gray-haired man*

won our sympathy, or, *The French sailor was decorated for bravery*, and elicit that *gray-haired* and *French* are adjectives. Teachers then ask the pupils to identify the two phrases in *The man with gray hair . . .* and *The sailor from France. . .*. The question calls for old knowledge and the class answers, "Adjective Phrase." The phrases are then turned into clauses, thus, *The man, who has gray hair, . . .* and, *The sailor, who comes from France, . . .* "What does each clause tell us?" the class is asked. "What do we call a word that tells about a noun? A phrase that modifies a noun? What will you call a clause that modifies a noun?" With a feeling of triumph the teacher accepts the answer, "Adjective Clause."

The critical mind may wonder why this nice logical development; what if a word can be expanded into a phrase and a phrase, in turn, into a clause! Why should a grammatical element be taught by changing a good expression, *The gray-haired man* into a weaker one, *The man with gray hair*, and, then, into a watery one, *The man, who has gray hair*? What teacher of English would not draw the blue pencil through the clause, *who comes from France*, and insist on the proper adjective, *French*? Clearly, the logical unfoldment does not, in this instance, reveal the practical value of the topic, "Adjective Clause."

Begin with the last written compositions. Select sentences that are simple and related in thought but nevertheless completely cut off from one another. These are then put on the blackboard, thus,

1. Lindbergh began his flight. It was to make him a world hero.
2. In the fog Commander Byrd saw a lighthouse. He mistook it for a boat.

These and similar related sentences are read with an exaggerated slowness that emphasizes their immature quality. The children are then asked for criticism. Assuming that nothing helpful is elicited, the teacher might read the following: "See the cat. It is black. It is on the box." Now re-read the sentences taken from the compositions and the

class volunteers promptly, "The sentences are too short and childish." "What is to be done?" "Combine them." "How?" The obvious conjunction *and* is suggested. The teacher now reads, "Lindbergh began his flight and it was to make him a world hero." The class sees that there is really no improvement. "Combine them in such a way that your audience must listen to the last word," the teacher advises. If the children fail, the teacher suggests the use of such words as *that* and *which*. Now hands are raised in eagerness and the children give,

1. The flight that Lindbergh began was to make him a world hero.
2. The lighthouse that Commander Byrd saw, he mistook for a ship.

Try another pair of sentences that can be combined by the relative pronoun *who*. At this point, the teacher asks, "What shall we take up in to-day's language study?" The reply will very likely be, "More about those words, *who*, *that*, *which*" and "More about how to combine sentences." Every child saw the value of the proposed lesson. The importance of the clause was clearly brought out. To lead the class to see that these clauses relate to nouns and perform the function of an adjective, is the work of but a few moments.

An Illustration of Motivation in Arithmetic.—In teaching a short cut, multiplying by $12\frac{1}{2}$ or $16\frac{2}{3}$, do not announce, "To-day, we shall learn a new way or a shorter way of multiplying." To most children this is more of a threat than a promise, for they are well satisfied with the one way of multiplying that they know. Write on the blackboard two examples, like the following:

At $12\frac{1}{2}$ cents a piece, what will 648 notebooks cost?

What will this school pay for 192 compasses at $16\frac{2}{3}$ cents each?

The class is told that on the signal, teacher and pupils will begin and at the end of the second answer, each will write the number of seconds he required for both examples. The signal is given and work begins. The teacher divides 648

by 8 and adds two ciphers, then divides 192 by 6 and adds two ciphers, and puts her pencil down with exaggerated noise. The class looks up amazed and struggles on with $648 \times .12\frac{1}{2}$. "How did I get the answer so quickly," the teacher asked. To this, the reply came promptly, "You have a trick." The teacher admitted that she had. There was no need of asking the pupils whether they wanted the trick; their desire was written on their faces. Active interest was aroused and effort was therefore assured.

An Illustration of Motivation in Science.—The course of study called for the topic, "Function of Leaves." Surely nothing is gained by telling the class, "In this lesson we are to learn what leaves do for a plant." To the young pupil, a leaf is a leaf and it invites no special attention. Instead of stating the aim so coldly, show the child that you have deliberately turned each plant on the window-sill so that its leaves point towards the center of the room. A chalk line running down each flower pot and continuing vertically on the sill will enable them to tell whether these plants have been moved. The class wonders what will happen. Each session, two minutes are spent examining the chalk lines and noticing the position of the leaves. If the weather is favorable, the children are surprised on the third day to find each leaf turning toward the window. "Why did the leaf do this? How did it do this? What makes it do this?" These questions came thick and fast. If the lesson were to end at this point, the children would probably persist in their questioning. Here, clearly, is an illustration that reveals the significance of well motivated teaching. In this lesson motivation is achieved not by showing the social value of the experience but rather by appealing to fundamental instincts and interests—curiosity and a desire to understand what is happening before one's very eyes.

Advantages of Motivation.—In motivated teaching, every task seems reasonable and is vibrant with life. Children attack their assignments not in a spirit of blind obedience but with a desire to know and to do. The problems of interest and attention or effort are solved because the whole experi-

ence seems real and vital. Watch how intently the child repairs his wagon or works away at his boat that refuses to stay upright in the water, or cuts out the linoleum block that is to produce a print that he has designed. School work will command the same degree of concentration when it is made as genuine and as significant as these tasks are in the life of the child.

Thorndike formulated the law of effect, now seriously questioned in some quarters, as one of the major factors in the learning process. Every individual, he says, tends to repeat and learn quickly those experiences that are accompanied by a feeling of satisfaction. The converse is, of course, just as true. The emotional tone of an experience intensifies the formation or the inhibition of neural patterns. What is done through coercion or fear of punishment is usually not done quickly or cheerfully. What is done because of its inherent significance for the individual tends to be done willingly and more effectively. Motivation, therefore, quickens learning because it insures the proper emotional accompaniment and reveals to the pupil the value of the knowledge he is expected to acquire.

Motivation Is Not a Panacea.—We must not conclude that motivation is a nostrum for all pedagogical ills. It can do much to place teaching on a higher plane, but the situations in which it is impossible are not uncommon. Because its experience is of necessity greatly limited, the child may not perceive the need of a particular set of facts or skills. What reason, within the comprehension of the child, can one give for learning most of the factual history of our country? The adult understands that the past explains the present, but the child does not. How shall we motivate the learning of much necessary locational geography? In the child's narrow world, these facts play no part. How can we motivate the classification of words into adjectives and adverbs? To the teacher the very terminology promises economy in language and in thought. Are we motivating a lesson when we tell the pupils that unless they learn this groundwork, they will not understand, next year, the more advanced and highly useful prin-

ciples of language? Motivation means justifying an experience in terms of present and obvious need. In all teaching, occasions arise in which the pupils must accept the teacher's judgment that a particular set of facts or skills is socially necessary.

Myra Kelly tells of a Jewish lad who worked in the East Side sweat shops pulling out stitches from finished garments. The lad was paid by the piece system—so much for each dozen. One day he became suspicious of his employer's arithmetic and, fearing that he was being underpaid, decided to go to school and learn to add pay slips on "finished pants" during the so-called "slack season." The first lesson of the day, music and opening exercise, he bore with some patience, although not without disappointment. Evidently the teachers wanted to give them "enjoyings" before work began. Manual training came next. This was followed by a calisthenic drill. The patience of the little "baistin'-puller" was taxed to a point beyond endurance. He rose in his wrath and announced his intentions of leaving the institution where learning was so shamed. The teacher tried to argue, but the lad refused to stay and waste more time. "I came to learn how to add checks on the pants, not to make with the hands and the feet," he said indignantly. We know that it is exceedingly important to "make with the hands and the feet," but we cannot always show our children the reason.

We must ever guard against spurious motivation. Experienced teachers and supervisors were asked what motive they would supply to justify learning the geography of Chile. Various motives were suggested—possession of a fund of facts that might be useful in travel, knowledge of the world in which we live, knowledge of a power that we would protect from aggression, and ability to locate places mentioned in the newspapers. These were rejected by the instructor of methodology. Teach Chile because "it is the home of nitrates; no nitrates, no fertilizers for our farmers." How genuine a motive is this to the average boy or girl of twelve in our rapidly urbanizing communities? Ask the class whether it is not necessary to study Chile because that country supplies

nitrate and nitrates are used as fertilizers, and a unanimous affirmative is promptly evoked. But the answer is hollow. The children know the answer that the teacher expects and they give it. To say the contrary is to arouse displeasure. Wherever genuine motivation can be established, we must not teach without it. But we must recognize that occasionally teaching must proceed on the basis of authority.

II. THE LAW OF ASSOCIATION AND ORGANIZATION

Learning Defined.—In its final analysis, learning is the process of producing modification in the reactions of an individual because of what he has experienced. Not until the mind has established a permanent association among 5, 12, and 60, has it learned $5 \times 12 = 60$; not until it has bound the word latitude with the idea of distance north and south of the equator, has it learned the meaning of latitude. So, in all subjects, learning takes place when an association is successfully established.

Relative Values of Arbitrary and Meaningful Association.—In our discussion of memory we saw that events may be associated in the accidental sequence of time or space in which they happen to occur. The child studies that the Rhine River flows north and the Rhone River south; in words like *deceive*, *believe*, *c* takes *ei* and *l* takes *ie*; these are examples of mechanical or arbitrary association. But having no rational basis, such facts are soon forgotten. In an attempt to aid the mind, teachers invent ingenious mnemonics: Rhine recalls *i* of high, to the north; Rhone brings *o* of low, to the south; *ei* follows *c* because *e* is nearer to *c* than *i*, and *ie* follows *l* by the same law of proximity. These artificial attempts to introduce a semblance of reason may require more learning effort than the original facts.

But when experiences are associated logically because of their similarity, or their difference or because of causal relationship, they are retained longer and recalled more easily. We really do not reason facts *out*, we reason them *in*. Every logical or meaningful association calls up in its turn other

associations until a veritable network of dependent and related facts is woven about each new fact.

Applications to Teaching.—*Location of Cities.*—In teaching the cities of the United States, one of two practices may be adopted. The usual method is to take up each state and require the children to learn its capital and at least one important city. For large states like Ohio or Pennsylvania the number may be increased to six. The association is purely mechanical, Ohio—Columbus; Pennsylvania—Harrisburg. A measure of meaningful association may be introduced by grouping the cities physiographically, industrially, or commercially, thus: name ten important Atlantic seaboard cities, ten Atlantic plain cities, three Eastern Piedmont cities, four Mississippi River cities, five Great Lake cities, three cities that are cotton markets, three that are coal markets, ten cities on the New York Central between New York and Chicago, two cities that manufacture textiles, two that manufacture steel, etc. True, both procedures require many repetitions, but the second strives to introduce a form of association that has a small measure of reason.

Introductory Reading.—Children who do not know the alphabet find it easier to remember the word form, *father*, or *man*, than the name of the letter *f* or *m*. Even though the words are longer than the letters, the symbols, *f-a-t-h-e-r* taken together, do call up something that is known, but the letter *f* is new in form, name, and meaning. Hence early reading should begin with sentences and words and not with letters.

Military Events.—Children experience great difficulty in learning the battles of the Civil War when they are presented chronologically. In any one year, say 1863, they see fighting on the coast, on the Mississippi, and in Pennsylvania; slowly the impression grows that a war is conducted by staging battles all over the map. Neither purpose nor plan is revealed in the purely chronological organization with its mechanical association.

Let the class assume full responsibility for the military conduct of the war by the North. As an introductory step, the class is guided to the conclusion that a comprehensive set of

plans must be worked out before sending a single soldier into the field. A few well chosen questions lead pupils to see that the South will need money; that it will sell cotton to obtain money and credit; that therefore the North must prevent the South from shipping cotton, and that blockading the harbors will accomplish this end. Here we have the first campaign which ended in 1862, in the fight between the *Monitor* and the *Merrimac*. By similar logical questions we can elicit from the class (a) the need of taking the Mississippi and cutting the Confederacy in two, and (b) the need of capturing Richmond. Here, then, are the second and third campaigns of the war. Teach each campaign as a continuous story from beginning to end. By studying the map the children can often foretell the next move of the defeated army. The military history of the Civil War is, therefore, made up of three stories, each with its own objective and with its own sequence of events. Topical history gives systems of logical association; chronological history relies on the accident of time to relate events and, therefore, produces severely mechanical associations.

Memorizing Literary Selections.—A chain of rational associations may be established even in lessons which demand verbatim memorization. Few children enjoy the memory gem lesson because the memory element is emphasized to the exclusion of the gem. We must, therefore, zealously avoid such directions for memorization as, "Repeat the first line three times; the second line, three times; the first two lines, three times, or the first sentence, five times," and the like. Correct teaching procedure must make an intense thought appeal, omitting altogether the mechanical repetition of set lines or sentences. Since a good memory is selective, the act of remembering is essentially the art of thinking.

Let us apply these general suggestions to the memorization of John McCrae's "In Flanders Fields."

IN FLANDERS FIELDS

In Flanders fields the poppies blow
Between the crosses, row on row,

That mark our place; and in the sky
The larks, still bravely singing, fly
Scarce heard amid the guns below.

We are the Dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders fields.

Take up our quarrel with the foe:
To you from failing hands we throw
The torch; be yours to hold it high.
If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.

The poem should be made the subject of an intensive appreciative reading lesson so that the children will know the circumstances under which it was written and will understand its message. Through questions they are led to perceive that the very simplicity of the language is evidence of the author's deep feeling. The class then discusses the most effective oral reading of the poem—what words or phrases must be stressed? What pauses must be prolonged? In what voice should it be read?

If the children are really moved by the poem, we suggest that they may make it theirs for all time by memorizing it.

The first step in learning by heart is to list the *ideas in sequence* and to master them, thus,

In Flanders fields, poppies blow, between the crosses, in rows,
marking the graves in which we lie, in the sky the larks still sing
unafraid, we can scarcely hear them, etc.

Many children learn these ideas merely by listing them. Visualizing the scene as the author actually portrays it, is a help to others. This skeleton of ideas is extremely helpful. It gives a framework on which the actual words may be hung. It facilitates the mastery of the author's language because the thoughts tend to bring to mind suitable words with which

they may be clothed. And finally, it insures recall that is rational. Observe a pupil reciting a poem that has been mechanically memorized. The prolonged stare gives evidence that the child is trying to revisualize the next word or the first word on the next line. The recall is in terms of verbal elements rather than of ideas. When the pupil is trying to recall the succeeding thought, he usually suits the word to the idea; if he has forgotten the language in the original, he supplies his own.

The next step is to subject each idea to a question or two and to require answers, as far as possible, in full sentences, but always in the author's words. The following is a verbatim reproduction of this part of the lesson:

Teacher: Where do the poppies blow?

Pupil: Between the crosses in Flanders.

Teacher: No! Answer in full and use the exact words of the poem.

Pupil: In Flanders fields the poppies blow,
Between the crosses, row on row.

Teacher: How are the crosses set?

Pupil: Row on row.

Teacher: Describe the flowered cemetery.

Pupil: In Flanders fields, the poppies blow
Between the crosses, row on row,
That mark our place.

Teacher: What tells you that the larks are not frightened?

Pupil: In the sky, the larks, still bravely singing, fly.

Thus, questions and answers continue until a reasonable section of the poem is concluded.

The third step is to tie all the ideas together. Again, we fall back on questions that call for discrimination and selection. General questions are now asked which require the rereading of the stanza; as before, no answer is accepted unless it is given in the words of the poem.

Teacher: What lines say that the men were killed recently?

Pupil: Short days ago,
We lived, felt dawn, saw sunset glow.

Other questions of the general type, which may be asked, are: What lines give the best picture? The happiest or the saddest picture? What line is easiest to remember? Most difficult to learn? What line tells you most about the character of the men? What lines present a contrast of two very different things? What lines give you the mood of the poem? What lines tell you that these men loved life? Each question supplies the class with a purpose for rereading the stanza; each rereading involves rethinking. After five or six of these questions have been answered, call on children to recite the first stanza. As a rule, about three-fourths of the class can do so creditably. The basic aim of the lesson is to introduce so many logical associations that both appreciative understanding and complete mastery are achieved.

Learning in Natural Association.—There is always a wide gap between mastery of a formal element and ability to apply it in a natural association. Children may know 8×9 but still be unable to find the cost of nine paper portfolios at 8 cents each; they may never err in giving the principal parts of the verb come, but may persist in saying, "He has came." The child who does not know the cost of the portfolios is asked, what is 8×9 and promptly replies, 72. The teacher impatiently demands of the child who says, *I have went to the store*, "Give me the parts of the verb *to go*," and receives an instantaneous, *go, went, going, gone*. Facts learned in one association, $8 \times 9 = 72$, and, *ccme, came, coming, come*, will not necessarily be known in a new association, *9 things at 8 cents each*, or *I have come and He has come*.

The common complaint of teachers is that the school program allows too little time for drill. An analysis of the situation usually reveals that less time more judiciously spent would yield better results. If drills were differentiated according to the need of the individual, and, further, if they were given in the very associations in which formal knowledge is required in everyday life, marked economy in learning would be achieved.

While some formal drill in number combinations is necessary, more drill in practical problems should be provided.

Teachers must recognize the fallacy of the time-honored belief that children who know the tables can use them. Drills in language should be given in sentences. We must banish from our classrooms, for all time, such drills, as, *go, went, going, gone; deer, deer; who, whose, whom; I shall, you will, he will, we shall, you will, they will*. In their place the child must give the full forms:

I go to school every day, I went to school regularly last year, I am going to Lincoln Park, I have gone on that very errand this week. The man shot a deer but his guide shot three deer. Who will be honored to-day? Whose bravery will be rewarded? Whom shall we honor to-day?

Drill on form divorced from content develops mastery of form only. The child who learns in this way is usually unable to select the necessary elements and make them function correctly in a genuine situation.

Meaning of Organization.—The term organization has a larger connotation than the term association. The latter, more often, refers specifically to the bond set up between two successive experiences. Organization is concerned with the grouping of related knowledge regardless of the sequence in which constituent facts were acquired. When one develops a topical outline or marshals all the facts that prove his side of a dispute, he is organizing his knowledge.

Effective organization has at least three distinguishing characteristics: (a) It abounds in logical rather than mechanical associations. (b) The relative importance of the various subtopics is apparent. (c) An underlying purpose or goal is readily discerned. A well organized discussion may introduce two or four lines of thought, but back of all of them, there is a unifying objective that gives them direction.

Illustrative Lessons.—Let us apply this threefold standard of organization to the illustrative lessons in this part of the chapter. Does each lesson introduce a system of logical association? Are all facts made equally significant? Can we identify, in each lesson, an objective that gives its direction and character? Answers to these queries will give a helpful analysis of these lessons and will gauge their worth.

The Causal Series requires the teaching of a geographic unit by the following steps:

I. Physical Aspect

1. Location
2. Size
3. Shape
4. Surface
5. Climate

II. Resources and Economic Significance

1. The resources as determined by I, above
2. Occupations and industries as determined by resources
3. Products which result from the chief occupations
4. Exports and imports as determined by products and human needs
5. Trade routes as determined by the exports and imports
6. Cities, the terminal points in trade routes
7. The inhabitants who produce and transport
8. Government which controls these people

One may reasonably object to following this table too frequently on the ground that by imposing a mature mode of thinking upon children, we leave them no choice but to imitate it. Judged solely as a bit of organization, we must commend the Causal Series because (a) it does associate facts logically; (b) it does stress what is significant—occupations, products, exports, and imports—the economic aspect of a country rather than the mere physical facts; and (c) it does reveal a basic purpose—to make geography a study of *the earth as the home of man* rather than mere earth study.

In the study of recitation patterns we shall find added illustrations of effective organization when we analyze problem and project teaching. Thinking a problem through to its solution requires severely logical organization. Suitable problem and project recitations insure vital training in this type of thinking.

Making Learning Thorough.—The term defined. Knowledge properly organized becomes more thorough. To many, thoroughness seems to be a degree of completeness to be attained in teaching and in study. To them thoroughness

results from the accumulation of much information. They feel that the mind of the thorough student of history or literature is encyclopedic in content and reliable in its control of names, dates, and technical facts. A thorough study of a Shakespearean play would include not only the life of the author and the sources of the story but every historic and mythological reference, every obsolescent word and every irregularity of sentence structure and of versification. But the possession of details does not necessarily lead to an understanding of fundamentals. Thoroughness is a degree of comprehension resulting from deeper understanding and richer interpretation of specific facts. True, a conclusion not based on an adequate foundation of fact, is worthless. But, in the pursuit of facts, one comes to a point beyond which added information encumbers rather than enlightens the mind.

Most courses of study prescribe the topic, Causes of the War for Independence, in two distinct grades—usually in the sixth and in the eighth. To make the eighth-grade lesson more thorough, a teacher reviewed the four causes taught in the sixth grade—Stamp Act, Navigation Act, attempt to quarter English soldiers in American homes, and the Boston Massacre—and then proceeded to add four others like the Hatters' Regulation and prohibition of the manufacture of certain articles. Thoroughness was interpreted quantitatively. Although more facts were added, the basic point of view remained the same. To make the lesson more thorough, the teacher should have presented the English side of the controversy. Why did England seek to control the shipping and manufacturing, leaving the development of raw materials to the colonies? What was England's answer to, "Taxation without representation is tyranny?" How many soldiers were actually quartered in the homes of the colonists? Now, the children begin to realize that the war was caused not by sheer cruelty on the part of the British but rather by the fact that the colonies and the mother country held opposite and irreconcilable views on fundamental economic and political questions. The same facts properly interpreted give a new conclusion that is more liberal and in closer keeping with truth.

How to Produce Thoroughness.—The condition known as thoroughness may be produced by (a) giving added points of view or new interpretations; (b) drawing comparisons; (c) solving new problems in terms of known data. The first method we have just illustrated. Lessons which apply to the other two must now be analyzed.

Comparing two poems, two countries, two statesmen, two schools of artists, or two arithmetical processes invariably gives a better understanding of each element in the comparison. Children who have studied the geography of the United States possess at best superficial knowledge of facts. Not until they compare the size, range of climate, resources, occupations, industries, and products of the United States with those of France or of England do they begin to understand the key position of America in the family of nations. Each of two poems read by itself, under the guidance of the teacher, may tell its message and arouse the mood intended by its author. Compare the themes of these two poems, their modes of treatment, their distinctive techniques and each glows with deeper meaning. Every worth while comparison gives deeper insight into knowledge.

Newly acquired data are effectively reviewed and given new meaning when used to solve problems. The geography of the United States completed, the children are asked to discuss such questions as the following:

The League of Nations cannot succeed without the membership of the United States.

The United States can maintain itself, even if completely cut off from all other nations.

Rarely has nature been as generous with a nation as with the United States.

In formulating a complete answer to any of these problems, the facts studied must be recalled and regrouped so that they point to a conclusion that is new to the class. In such a review lesson, minds are enriched not so much by added facts as by a reëvaluation of the known facts.

Added points of view, new interpretations, remarshaling of

old data for a new purpose—these are practices that make immature minds better informed and enriched by more liberal conclusions. Thoroughness is, therefore, more qualitative than quantitative, more intensive than extensive.

III. THE LAW OF REPETITION OR FREQUENCY

The Law Stated.—Other things equal, the more frequently a neural pattern is excited, the greater is its readiness for expression. Such synaptic connections as are established for any experience, are naturally strengthened by repetitions. The price of retention is use.¹

Characteristics of Effective Repetitions.—The old adage, "Practice makes perfect," is correct within certain restrictions. It is more important that the repetitions be well distributed than numerous. Practice should be regular and frequent—a little every day or every other day rather than innumerable times one day followed by a respite of two weeks. Neural patterns tend to become dimmed unless reënacted; the more *recent* the experience the better do we know it. Continuous practice, therefore, gives to experience what the psychologist terms, *recency*. Repetitions, with progressively increasing intervals, are probably far more productive than the same number of repetitions at equal intervals.

The Law Applied.—In making up the daily schedule, short periods that give a subject a regularly recurring rather than an intermittent or occasional place enhance the learning process. If the course of study assigns 120 minutes a week for geography, four 30-minute periods on four different days are usually better than three 40-minute periods, and decidedly better than two 60-minute periods. Demands for well articulated speech or for correct posture in all subjects and at all times may develop desired habits by making practice con-

¹ Since we tend to repeat what is satisfying, the law of repetition or exercise and the law of effect may not be as different in fact as in name. This law of exercise is to-day under much discussion. First impressions may be more important for learning than mere repetitions. Similarly, other factors enter into the learning process which seem to reduce the significance of mere repetitions. These are explained presently.

tinuous. To confine these standards to language lessons or physical training periods makes practice intermittent and failure almost inevitable.

The Requirement of Focalized Attention.—Practice makes perfect provided it be undertaken with an attentive mind. Three repetitions with focalized attention may insure greater success than twenty-four repetitions with diffused attention. Many children spend adequate time on their lessons but fail to learn them because they permit their minds to wander wherever their associations may lead. The most important single cause of waste in learning is repetition without attention. This fact gives added significance to the law of motivation which teaches that before practice periods are begun, the teacher should lead pupils to see the end to be attained and its value to them. Further applications of this simple principle will be given in the discussion of the drill lesson.

IV. THE LAW OF INTENSITY OR VIVIDNESS

The Law Stated and Illustrated.—The greater the attention at the time of a neural response, the more effective is the control of the neural pattern. First impressions are significant because attention at that moment is intense. We forget important facts but remember the petty details of an examination taken long ago. A habit, we saw, may be acquired through a single experience that comes as a shock. Each mind seems especially retentive in those fields that lie closest to its interests. The athlete remembers the names and the achievements of former athletes but finds great difficulty in remembering the significant facts of history. The absent-minded professor may forget much but he has a tenacious memory for all the details of his specialty. What both the athlete and the professor forget is outside of the fields of their interests and hence commands little attention.

Application of the Law to Teaching.—In order to maintain that attention which insures successful learning, the approach to new lessons should be more psychological than logical. In teaching a literary masterpiece, logical development may

counsel that we present the life of an author before we teach his work. In such procedure, there is little motivation. To most children, literary folk are not especially interesting. Hence, read the masterpiece first; let the pupils thrill with Brutus as he fights against Cæsar, whom he loves. Then introduce the story of the poor boy of limited training who succeeded in writing for all time.

A teacher introduced the subjunctive mood with "Having studied the indicative and the imperative moods, let us now take up a new one, the subjunctive." The first two seemed useless enough, why a third mood? The attitude of the class is one of submission, rather than anticipation of knowledge that seems necessary. Would the teacher not obtain real response by asking the children to indicate the correct verb in the sentence, *If I (was) (were) he, the race would have been won?* The class as a whole usually thinks "I was" and offers the verb *was*. "Incorrect," says the teacher. "If I were" is correct in that sentence. Try another: "(Was, Were) I the president of the class, order would always be maintained." Again the class thinks, "I were the president, no, I was the president" and offers the verb *was*. Once more the answer is rejected and the teacher gives a third sentence. Now few, if any, respond. When pressed for the reason, some children said, "Every one knows that *he was* is correct but you say it is not. How can we tell what to say?" The teacher then asked, "What would be an interesting problem for our language lesson to-day?" The class was challenged and wanted to know why that which to them was obviously correct was now declared incorrect. The whole experience was made vivid by revealing to the pupils the inadequacy of their knowledge of language forms.

Another illustration taken from elementary science may further illustrate the point. In presenting the subject of levers, the teacher followed a severely logical development. First, levers were defined; second, the fulcrum, power arm, and weight were explained and on the basis of their relative position levers were grouped into three classes; third, different types of levers were identified and analyzed. Surely, no ele-

mentary textbook would follow a more logical presentation. But neither the first nor the second step in this lesson attracted the pupils. The last step proved more interesting but came too late to hold the class.

For vividness of presentation, begin at the point of contact, the place where the lesson touches the life of the child. In another class, a long board was placed on a small support. The teacher then announced that the smallest pupil in the class would lift the largest one. The smiles on the round faces showed that the class knew that Jane could never lift Walter. The board was adjusted so that Jane had about three-fourths of it and Walter only one-fourth of it. After the two children were seated comfortably, in see-saw fashion, those supporting the board, let it go. Up went heavy Walter and down went little Jane. She had lifted the heaviest boy in the class clear off the floor. The teacher asked, "Why this surprise, haven't you ever seen a small body lift a much heavier one?" The answers came after a few moments: "The iceman's scale, the man with the crowbar, the boy rowing his father to shore." Every one was eager to learn how these feats are accomplished. What was the third step in the first lesson became the introductory one here. The teacher began the lesson in the experiences of the children. The pupils and not the subject determined the approach. The preparation of the lesson was psychological rather than logical and created an impression vivid enough to sustain attention until the situation was clearly understood. The coefficient of retention for such experience is, of necessity, gratifyingly high.

V. THE LAW OF WHOLE AND PART LEARNING

The Methods Illustrated.—In learning a list of products one may repeat it as a whole until it is known or learn the first few items, then another few until the whole list is mastered. A short poem may be memorized by studying the whole poem or by learning successive sentences through repetitions of each. A campaign may be studied by tracing and retracing its progress from the beginning to the end or

by learning the first part through repetitions, then the second part, and so on, to the conclusion.

Relative Value of Whole and Part Method.—Orthodox opinion has long held that the whole method is superior to the part,² but more recent studies³ challenge this positive conclusion. It appears that the two methods are almost equally efficient and that the results obtained by either are conditioned by (a) the idiosyncrasies of the individual student, and (b) the inherent logic of the material to be studied. A stanza in which the ideas follow in close and natural sequence or a military campaign that achieved its objective through the logic of its well conceived plan would probably yield better results if studied as a whole.

Where the part method is used, each succeeding part studied should be related to the preceding ones that are thus reviewed. The second of the five clauses in an important treaty of peace is related to the first; when the third clause is understood and learned, it is associated with the first and the second. With each succeeding clause, a review takes place and a new integration of old and new knowledge occurs. This gives a progressive part method that combines the advantages of both the extreme methods. More experimental data based on larger and more varied groups must be assembled before more positive statements can be made with respect to part-and-whole learning.

VI. THE LAW OF MULTIPLE SENSE APPEAL

Our faith in the old maxim, teach through as many senses as possible, rests more on logical inference than on experimental data. It seems reasonable to argue that as each sense is called into the learning process, new neural patterns are formed; that it is easier to restimulate one of three neural patterns than one of two; that as we increase the number

² We may mention, Meumann, Colvin, Gates, Freeman, Pillsbury, and Woodworth among others.

³ H. B. Reed, "Part and Whole Method of Learning," *Journal of Educational Psychology*, Vol. 15 (1924), pp. 107-115. Similar results were obtained by Pechstein.

of senses to which we appeal, our contact with an experience becomes enriched. Hence in such formal learning as spelling, the teaching novice is advised to have the class see the new word or its difficult part, to hear it, and to write it, thus obtaining visual, auditory, and muscular registration of the succession of symbols. Similarly, the child should learn two pints make one quart and thirty-six inches make one yard, by seeing the units of measuring, by hearing the equivalents expressed, and by actually using the units, thus obtaining three sets of sense experiences.

Our previous observations of sense types raises many doubts. May not the auditory experience in spelling actually retard the individual who has visual preferences for *linguistic* elements? For such a pupil, will not a multiple sense appeal set up conflicts in the learning process? Is it not wiser to urge a single sense appeal, the preferred sense, in individual study and multiple sense appeal in class teachings? These are doubts that did not assail the highly departmentalized introspective psychology of yesterday. To-day, we wait patiently for experimental studies to supply reliable data for either accepting or rejecting our tentative conclusions concerning the effectiveness of multiple sense appeals.

VII. THE LAW OF CONFLICT

Consciousness tends to express itself in action. Not infrequently, different neural pathways or neural patterns seek to react simultaneously. The patterns may be mutually complementary, working in the same direction, or antagonistic, leading to antithetical ends. Learning is retarded or accelerated, depending upon the concord or discord existing among impulses at a given time.

Sometimes two experiences may involve partly similar neural patterns and thus interfere with each other. Two lists of products or two lines of poetry or two stanzas may begin the same way. Words like *believe* and *receive*, *there* and *their*, *principal* and *principle* taught in the grades remain a source of worry even to the college student.

We may regard these situations as difficulties inherent in the subject matter, designed to be mastered only by dint of repetition. The teacher may help, however, by rationalized methodology. Products should not be taught in lists. Children should deduce the probable products of a country from their knowledge of its surface conditions, climate and resources. These inferences should then be verified by consulting the class text. The products in the corrected list should be spotted on an outline map so that product and appropriate region are closely associated. If children study the products from the product map of their own making, little confusion will arise. Similar emphasis on rational associations will minimize the confusion that may arise in memorizing lines of poetry that contain a repeated element. Stress the sequence of ideas and the similarity of language will become relatively insignificant. In the spelling of such words as are listed above, the element of conflict may be reduced in various ways. It is wise to teach one form at a time, allowing a fortnight to elapse before the second one is taught. The two forms, *principal* and *principle* may, after they have been taught separately, a fortnight apart, be set forth in contrasting context, thus, "The *principal* of our school was the *principal* speaker at the capital." "The religious leader heard his *principles* explained by his disciples." In this way each form is associated with its meaning. In words like *receive* and *believe*, a simple rule may help; in words like *sieve*, *seize*, *grammar*, *foreign*, the critical parts are indicated by the use of different colored chalk, by different type of lettering, or by any means that will focus attention on them thus, sIEve



s|ci|ze, grammAr, for-eign. These devices do not eliminate the conflict; they merely reduce it.

VIII. THE LAW OF SELF-ACTIVITY

Much that has been said in an earlier chapter ⁴ about self-activity emphasizes that learning takes place in direct pro-

⁴ See pages 323-330.

portion to the effort exerted by the individual, that teaching, at best, is a process of arousing and directing the self-activity of the pupil towards a definite goal; that effective teaching provides a variety of ways in which pupils may apply their knowledge. In the final analysis, the pupils' reactions to an experience rather than the teacher's exposition will determine their understanding and retention of it.

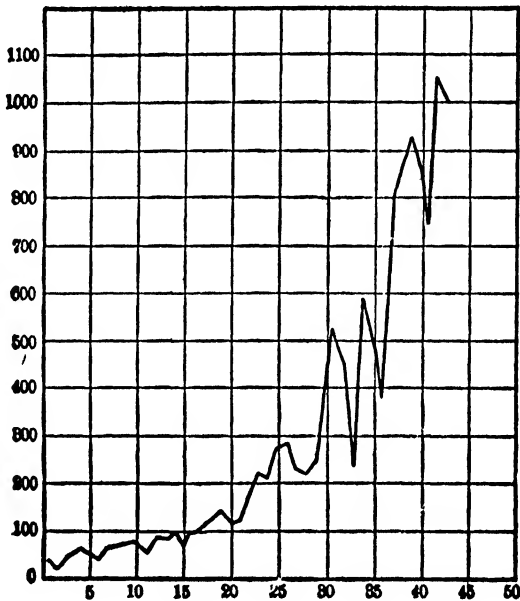


FIG. 16. LEARNING CURVE SHOWING PROGRESS MADE IN BALL TOSSING

The horizontal axis represents days. The vertical axis represents the number of balls caught.

(From *The Mind in the Making*, by Edgar James Swift. Copyright 1908. Courtesy of Charles Scribner's Sons.)

The Curve of Learning.—The rate of learning expressed in terms of units of progress and represented graphically gives us a curve of learning. The records on which these curves are based are usually derived from a study of the acquisition

of a motor skill like learning to toss a ball, and to do mirror writing. The character of the learning curve for more intellectual skills may vary significantly from those that represent acquisition of these motor skills.

Figure 16 represents progress made in ball tossing, the figures on the horizontal axis represent the number of days and those on the vertical axis, the number of balls caught.

An analysis of this curve shows that,

(a) at first progress is rapid; (b) later, there are many periods in which little or no progress is made; (c) periods of accelerated learning occur throughout the learning cycle; (d) an ultimate level of attainment is reached above which the individual seems unable to progress.

Many curves of learning reveal plateaus or no-learning periods which may be due to boredom or to fatigue or to the need of mechanizing lower levels of understanding before higher ones are attempted or may be inherent in the character of the learning process. These plateaus seem to be mere stopping places in an upward climb and need cause a student no discouragement. They seem to be occasions for consolidating and integrating what the individual has experienced. During these no-progress periods, the mind may give random thought to the skill it is trying to acquire and place a higher evaluation upon it. This favorable attitude may account for the spurt that follows a plateau.

We may question the advice, "Learn one thing thoroughly before beginning the next." Should children learn addition thoroughly before beginning subtraction? The curve of learning shows that habit acquisition is progressive and that when a useful degree of skill is attained, we may begin another process with the thought that in later years we shall revert to the first habit and carry it to higher proficiency.

Learning is, at best, a slow process. Concentrated learning is deceptive, as all who have "crammed" for examinations know too well. Our relations with a set of facts or with a process must be distributed over a stretch of time. In order to really know an idea, we must live with it. School courses to-day aim wisely at a spiral organization of their subject

matter. The same topics recur in successive grades, but each repetition is in a wider circle. In the fifth grade, for example, the work in arithmetic includes fundamental operations with whole numbers, common fractions, decimal fractions, denominate numbers, and percentage. In the following grade, the same arithmetical topics recur but each with a richer content. Old courses, on the contrary, gave exclusive attention to one topic in one grade. Skillful teaching often achieves this form of distributed learning by a spiral organization of its subject matter.

SUGGESTED READING

ON INTEREST AND MOTIVATION

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QUESTIONS FOR DISCUSSION

ON INTEREST AND MOTIVATION

1. Which of the following situations give evidence of interest:
- (a) A class pleased with a moving picture of the story of Evangeline
 - (b) A class studying a text preparatory to a written test
 - (c) A class in drawing copying a design
 - (d) A group of children unable to agree on the most suitable title for a book on dogs that they are to write, are debating the relative merits of certain proposals

Justify your answer.

2. Write a list of words, not more than six, that convey the characteristics of real interest.

3. James said, "Do every day or two, something, for no other reason than its difficulty, so that when the hour of dire need draws nigh, it may not find you unnerved and untrained to stand the test." Does this put James into the effort school? Why?

4. List the changes that would be made by one who had deserted the interest for the effort school in (a) methods of teaching, (b) class discipline, and (c) organization of the course of study.

5. Would you ever justify "sugarcoating"? When? State the justification.

6. Give instances, other than those cited in the text, of the following:

- (a) To interest make reasonably difficult rather than simple
- (b) Will is not trained by forced submission to authority
- (c) Interest is an active attitude towards experience
- (d) Interest is a feeling of worth in experience
- (e) Interest may be an end in education
- (f) Fictitious interest

7. Suggest a mode of motivating each of the following:

- (a) How to divide by a common fraction
- (b) The correct use of *its* and *it's*
- (c) The climate of an important foreign country
- (d) The passage of the quota immigration law
- (e) Adjectives and adverbs

8. Select the most effective illustration of motivation suggested in answer to number 7 above. Analyze its values and identify each one mentioned in the section entitled, "Advantages of Motivation."

9. Give instances of the following:

- (a) Teaching that justifiably omits motivation
- (b) Spurious or artificial motivation

10. Tell of three instances in which a temporary interest was dissipated by a fuller knowledge of the situation.

11. Plan a brief program of character training that is in harmony with the fundamental principles of this chapter.

12. Learning is conditioned by purpose and mental attitude. In what ways can a teacher utilize this fact?

ON LAWS OF LEARNING

1. A teacher advises his students to make sure that they understand and to systematize what they wish to remember. Does this teacher's advice epitomize the whole psychology of learning? Plan an outline of a complete discussion of your answer.

2. Assume that you are cramming a poem which you are reasonably sure you will be asked to write from memory at an examination. What part of the poem should receive your last glance? Why?

3. Illustrate learning by the whole and by the part method with reference to the following:

- (a) The exports and the imports of an important country
- (b) The terms of a treaty
- (c) Conditions favorable for the growth of cities
- (d) The steps by which a legislative bill becomes a law

4. How would you motivate the following habit forming experiences:

- (a) Tables in arithmetic
- (b) Recognition of phonograms
- (c) Locational geography
- (d) Factual history
- (e) Penmanship
- (f) Spelling of a list of ten words
- (g) Correct posture in sitting
- (h) A corrective physical exercise

5. Would you modify the following statements in any way? How? Why?

- (a) Repetition is the price of habit
- (b) Practice makes perfect
- (c) Learn one thing thoroughly before going on to the next

6. Cite an instance of learning taken from the play experience of a child, for example, learning to skate. Analyze this act of learning and point out as many laws of learning as you can. Cite an instance of learning from school subjects. Can the laws of learning you listed above be utilized in the classroom? Why? How?

7. Why is supervision of pupil effort essential in a habit forming experience like learning to typewrite or to write?

8. Children are often asked to write words one hundred times or a poem ten times as a form of punishment. The justification is that children are learning by repetition while being punished. What law or laws of learning are violated in such a practice?

9. At the beginning of the school year, there seems to be a spurt in learning, while at the end, there is an apparent retardation. Assuming these conditions to be true, what probable explanation may be offered?

10. Account for this statement by James: "We learn to swim in winter and to skate in summer." What probably happens during the no-practice period? Are you setting forth facts or inferences?

11. Explain why children who know the conjugation of verbs and the declension of nouns and pronouns in Latin frequently use incorrect forms in their translations from English into Latin. How would you conduct the drills in these forms? Why?

12. Review the content and the sequence of topics in this chapter. Criticize the organization of the subject, "The Laws of Learning," in the light of the three characteristics of effective organization set forth in the text.

13. How can thoroughness be attained in the teaching of the following:

- (a) The three, four, and five times tables in multiplication
- (b) The differences between adjectives and adverbs
- (c) The causes of tooth decay
- (d) The institution of slavery in the United States
- (e) The factors that determine climate

14. Illustrate from classroom experience each of the following:

- (a) Begin at the point of contact
- (b) Psychological vs. logical approach

15. Plan the approach to the following lessons:

- (a) How to divide by a decimal
- (b) The use of adjectives in such sentences as, The flower smells sweet
- (c) The climate of England
- (d) Stable and unstable equilibrium

16. Is there any basis for doubting the wisdom of the old advice to teach through as many senses as possible? Plan a scientific inquiry designed to give data on one of the questions at issue.

17. A class has just learned the cause of the longer days in summer. In what ways can children be led to apply their newly acquired knowledge? Make as complete a list as you can.

CHAPTER XXIV

THE RECITATION PATTERNS

We are concerned, in this section, with acquired modes of behavior and we have, therefore, studied the laws by which experience is not only remembered but also made to function as habit. Our immediate task is to analyze the different types of lessons which seek to develop socially approved and individually beneficial patterns of thought and action.

Meaning of Recitation.—The term, recitation, though much used, is rarely defined. To most people, it identifies a period in which the teacher questions the class either to test or to develop a new thought. The distinguishing characteristic of a recitation, it would seem, is that the class is being questioned. Technically, recitation refers to an enterprise in which class and teacher coöperate for the attainment of a chosen end. Let us assume that the teacher, through proper approach, led the pupils to observe that the value of a number may be decreased, not increased, by multiplication; or that the invention of machinery and the utilization of mechanical power stimulated the growth of modern cities and produced most of the present-day social and economic problems. The children set to work to find the explanations. They may question the teacher and listen to the explanation; they may seek light in books; they may experiment with different numbers; they may argue with one another about some phase of their problem; they may observe a series of charts or pictures found by the teacher—any coöperative undertaking that promises a satisfactory solution of a situation constitutes a recitation. Some writers urge the term *class-meeting* as a substitute for the term *recitation* because it is more descriptive of the actual classroom procedure.

Strictly speaking, the term *recitation* should be reserved for

those teaching practices that deliberately reproduce the steps that the mind would take if learning proceeded without direction by the teacher. We would then have as many forms of recitation as there are modes of thinking. But who can say how many modes of thought the mind employs? Common practice, therefore, places no such psychological restrictions on the use of the term *recitation*. Classifying recitations according to their intent, gives us the following arrangement:

- I. The Recitations Concerned Solely with Acquisition of Knowledge
 1. The Inductive Recitation
 2. The Deductive Recitation

- II. The Recitations Concerned with Permanent Retention
 1. The Drill Lesson
 2. The Review Lesson

- III. The Recitation Concerned with Development of Power Rather Than Knowledge
 1. The Observation Lesson
 2. The Lesson in Appreciation
 3. The Study Recitation
 4. The Problem Recitation
 5. The Project Recitation

- IV. The Recitation for Socialized Thinking or The Socialized Recitation

After a cursory analysis of the patterns of thought, we shall study each of these recitation modes, to ascertain its relative value and the extent, if any, to which it follows an identified pattern of thinking.

Types of Thought.—In formal psychology of the orthodox type, thinking is regarded as the mind's process of discovering relations among experiences. Hence the conclusion that there are three types of thinking—conception, judgment, and reasoning.

In conception, the mind forms a general idea, a class notion.

Thus, *soldier*, *gauge*, and *communicate* are concepts, for they represent any professional military man, any mechanical device for measuring, and any act of exchanging ideas, respectively. To arrive at a concept, one must discover the relationship among his perceptual experiences.

In *judgment*, the mind establishes a relationship between any two concepts. When we say, *Modern communication breaks down isolation*, we express a relationship between the two concepts, *communication* and *isolation*. *Reason* refers to the mind's process of recognizing relationship among judgments. One may argue, that modern communication, by breaking down isolation, spreads knowledge, leads to a better understanding among different peoples, and will hasten the dawn of world peace. Here, clearly, are several judgments that are interrelated, and point towards a conclusion, that theoretically, at least, seems reasonable.

Present-day objective psychology overturns this static and introspective formulation of three modes of thought. It regards thinking as a dynamic process, a flow of consciousness towards an end that seems reasonable or satisfying to the individual. When one gives himself to a reverie, he recalls images, selects a few and rejects most of the others; he admits one combination of images but dismisses another; he sees a relationship, becomes critical of it, agrees with parts of it and modifies others; and finally, rousing himself, he decides that he has wasted his time in a bit of day dreaming. Here is a flow of consciousness that terminates in the conclusion that the line of activity must be inhibited at once. Hence, according to our definition, it is thinking.

Thinking may be (A) *Noncritical* or (B) *Critical*. Under the former we may include: (1) reverie; (2) empirical thinking that leads to a decision through habit rather than reflection; (3) rationalization in which we are more concerned with maintaining our position than with reaching truth. Under *Critical Thinking* we recognize: (1) the reflective or judicial type which weighs experiences in search for an accurate conclusion; (2) the creative type, intent on ~~formulating a new~~ relationship in the world of things or ideas.

I. THE INDUCTIVE AND THE DEDUCTIVE RECITATION PATTERNS

Origin of the Inductive Recitation.—In their passion to psychologize education, the Herbartians studied the mode of arriving at concepts. The aim of learning facts, they argued, is to reach a rule or a principle, that is, a generalization or concept. Their analysis led them to believe that in the main, concepts have their origin in individual experiences which

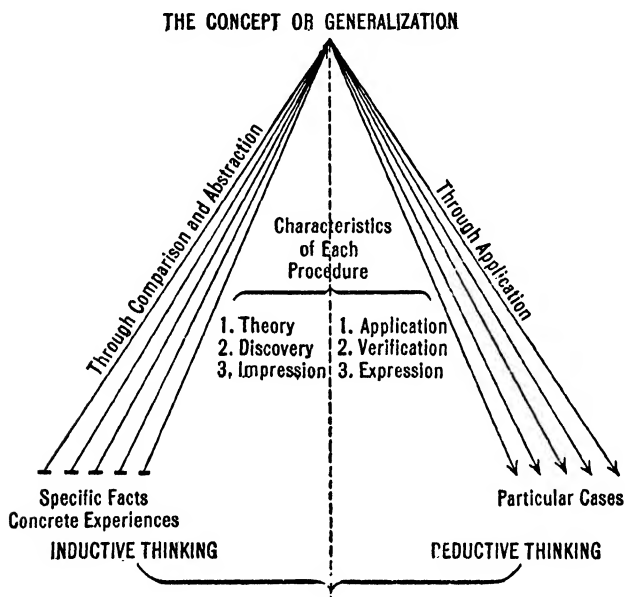


FIG. 17. THE INDUCTIVE-DEDUCTIVE METHOD

the mind (1) *perceives*, (2) *compares*, and from which it (3) *abstracts* common likenesses. After that, (4) the generalization is involuntarily evolved. A child folds papers into equal parts to show $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$; then, $\frac{2}{3}$, $\frac{3}{4}$; in a later lesson, $\frac{5}{8}$, $\frac{5}{4}$, $\frac{7}{4}$. In following lessons, the pupil *perceives* that the parts are always equal; that one of the equal parts may be taken; that more than one of the equal parts may be taken; that the equal parts of two folded papers may be combined to produce $\frac{5}{3}$ or $\frac{7}{4}$. *Comparing* these seemingly dissimilar

experiences, the mind notes the ever-present elements—equal, one or more; these are seized upon or *abstracted*, and the *concept*, fraction, is born. Not until this new knowledge about number is applied, is it retained and enriched in meaning. Kant observed that percepts that do not lead to concepts are blind, but that concepts that are not applied to percepts are empty. Diagrammatically, this succession of steps may be represented as shown above.

The modern form of the Herbartian recitation, therefore, contains the following steps: presentation, comparison, generalization, and application. These steps reproduce the stages in the inductive unfoldment of a concept as well as its application. To these is prefixed an introductory step in which the trend of the lesson is foreshadowed and the new knowledge is both motivated and related to old experiences. Because the first four inductive steps are supplemented by a fifth step, which is deductive, the Herbartian recitation has been called the *method-whole*. The complete organization is, therefore,

1. *Preparation*: (a) apperceptive basis laid for new knowledge; (b) aim of new lesson formulated; (c) new lesson motivated
2. *Presentation*: the facts of the new lesson are acquired
3. *Comparison*: the new facts are associated with kindred old knowledge and with one another
4. *Generalization*: the law, rule, definition, or principle is evolved
5. *Application*: the generalization is made to explain specific experiences

Illustrative Inductive Lesson on Reduction of Fractions.

—*Preparation*.—Elicit that 90 cents = 9 dimes; that 1 dime is $\frac{9}{10}$; that 9 dimes = $\frac{9}{10}$; that 1 cent = $\frac{1}{100}$; that 90 cents = $\frac{90}{100}$; that 90 cents = $\frac{90}{100} = \frac{9}{10}$; that in actual work $\frac{9}{10}$, not $\frac{90}{100}$, is preferred because of the convenience of small numbers. A class, asked to formulate the topic of the lesson, replied, "To learn how large numbers in fractions can be made smaller." The teacher accepted the thought and rephrased the aim, thus, "We must try to discover how to reduce the numerator and denominator of a fraction, without changing the value." Here we have an *apperceptive*

basis for the new knowledge, an *aim* for the lesson and a *motive* for learning new facts about fractions.

Presentation.—Prepared charts like the following are hung before the class. Each child has a number of sheets of paper that he folds in such a way as to reproduce the subdivisions of the diagrams.

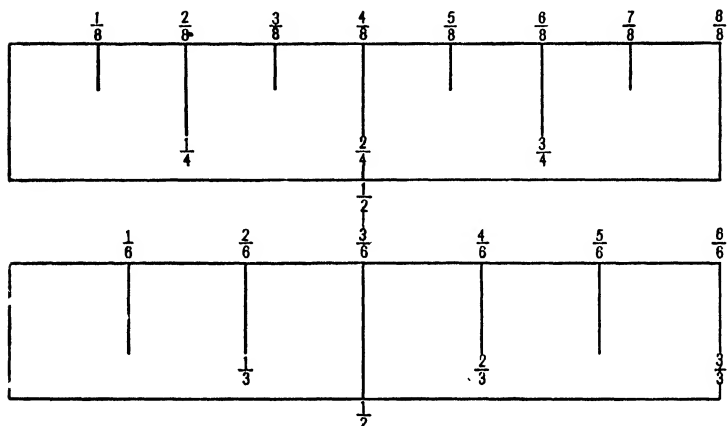


FIG. 18. ILLUSTRATIVE CHART FOR TEACHING FRACTION EQUIVALENTS

Through questions elicit with the aid of the diagrams and paper folding:

$$\begin{aligned} \frac{4}{8} &= \frac{1}{2} \\ \frac{2}{4} &= \frac{1}{2} \\ \frac{3}{6} &= \frac{1}{2} \\ \frac{4}{6} &= \frac{2}{3} \end{aligned}$$

Elicit further that in actual life one does not go about folding papers to obtain the answer; that a method must be discovered for getting the answer by computation; that to change $\frac{4}{8}$ into $\frac{1}{2}$, both terms of the fraction must be divided by 4, thus,

$$\frac{4 \div 4}{8 \div 4} = \frac{1}{2};$$

that, to change $\frac{3}{6}$ into $\frac{1}{2}$, both terms must be divided by 3, thus,

$$\begin{array}{r} 3 \div 3 \\ \hline 6 \div 3 \end{array} = \frac{1}{2}.$$

Continue with the remaining equations.

Comparison.—The children are led to compare the methods of reduction and to note that the same procedure is followed in all cases, that is, numerator and denominator are divided; that, the divisor used for one term of a fraction must be used for the other.

Generalization.—The children are then asked to give the rule for reducing fractions to lowest terms. The teacher must insist that the ideas of the generalization be given by the pupils; if their language is crude, refinements may be suggested to them.

Application.—The class is given suitable exercises in which this rule of arithmetic must be used.

Further Analysis of the Preparatory Step.—*The Nature of the Apperceptive Process.*—Apperception is a form of association in which new knowledge is interpreted in terms of old and old knowledge is reinterpreted in terms of the new. In apperception, old knowledge probably undergoes greater modification than the new. A new idea that does not call up related old ideas remains meaningless. No two people react to the same experience in the same way. The historian looking at a well modeled head of Lincoln, sees the Great Emancipator in the midst of the cares of that day; the minister sees in the face the lesson of courage, humility, and justice; the sculptor responds to the artistic stimulation. Apperception teaches that old knowledge is not dead weight but an active agent in interpreting new impressions.

The apperceptive process does not function unless attention is sustained and the stock of old ideas is sufficiently rich. In poorly graded teaching we ask children to interpret an advanced step without suitable groundwork. The child who can perform the cancellation in $\frac{2}{3} \times \frac{1}{4}$, may not know how

to proceed with $\frac{4}{8} \times \frac{1}{8}$. In the first example, the common divisor is seen, in the second, it must be inferred. In subtraction, the type " $7\frac{1}{8} - 3\frac{3}{4}$ " is rendered difficult unless the teacher introduces examples like $7 - 3\frac{3}{4}$ and $7\frac{1}{4} - 3\frac{3}{4}$ which act as apperceptive material for $7\frac{1}{8} - 3\frac{3}{4}$. The successful teacher of the formal subjects frequently spends much time and effort in working out careful gradations.

Misinterpretations are really erroneous apperceptions due, usually, to the recall of an incorrect apperceptive stock of ideas. The child who called the first snowfall, feathers, and a line of notes of music, barbed wire, or his older brother who thought scarred meant frightened (scared), simply permitted the improper interpretative stock to function.

The characteristic emotional tone gives color to the apperceptive reaction. At one time, a noise, even though persistent, is hardly noticed; at another, it becomes a source of great annoyance. Hamlet observes, with profound truth, that there is nothing good nor bad but thinking makes it so. Walt Whitman, hopelessly paralyzed in his invalid's chair, speaks of the joy of being alive, of being permitted to see nature in all her changing moods and colors. As his last hour draws near, his overwhelming optimism leads him to chide his long-faced friends, "I may be at death's door but I am not in death's shadow." Others, far less invalided and decidedly less helpless have conceived life as a "City of Dreadful Night," each hour of which is a "Ceaseless, termless hell." Apperception is truly the most significant factor in the processes of mental adjustment to life.

How Shall the Apperceptive Basis Be Laid?—The necessary old facts may be stated by the teacher or obtained from the class by well conceived questions. The former practice is almost futile; few listen and fewer hear. The latter places the burden on the pupils by compelling them to recall the old knowledge and to select the appropriate answer to the questions. The teacher may then reasonably assume that they have a suitable apperceptive basis for the lesson. At times, the apperceptive basis is laid by forecasting the various aspects from which a subject is about to be discussed.

The lecturer who announces that he will treat his topic from the political and economic viewpoints is virtually asking his audience to think along these lines and shut out other aspects.

Lessons in literature, ethics, history, or music that make a definite emotional appeal must condition children emotionally, otherwise they will not respond. Through suitable pictures, by forecasting the trend of the circumstance, and by asking the children to place themselves in a similar situation, we may create in them a mood not unrelated to the emotion which the lesson seeks to arouse and refine.

The Aim of a Lesson.—Every preparatory step must look forward as well as backward. The review of old knowledge becomes useless unless it soon foreshadows the trend or the objective of the new lesson. In teaching Washington's administration, we must point out, early in the recitation, the distinctive aspect of the events in these eight years, namely, that they are concerned with the problems attending the establishment of a new nation. Sixth-grade pupils were asked to enumerate a list of problems that would confront any group that tried to organize a new club with children who had had no club experience. Such a question elicited the following as the inevitable difficulties: "We would have no money; other clubs would not respect us; the members would not obey the officers; new members would not readily join this club for they would doubt whether we could exist." A hasty review of the condition of the country during the critical period was followed by the question, "What difficulties must have confronted Washington as he tried to set up the new nation?" Reasoning by analogy, the children gave "lack of money, international difficulties due to lack of respect for the new government, lack of credit because of a doubt as to the long continued existence of this government, disobedience and challenging of its authority." The preparatory step then closed with a statement of the aim: "I wonder how Washington solved these great problems." The minds of the children were prepared for Hamilton's financial policy, international complications, lack of credit, and refusal to pay revenue taxes—some of the basic problems of the first administration.

Values of a Specific Aim.—A clearly established aim serves many purposes. It gives teachers and pupils a measure of progress. They know what they want to accomplish; at the end of the lesson they gauge the extent to which they have achieved their objective. An aim makes for better organization of material because it determines not only the content but also the relative weight to be given to successive sub-topics of the lesson. Omit the aim, and all facts will probably sink to the same level of importance.

The proper mind-set is often assured by an aim. The teacher continues the lesson referred to above, reasonably certain that the pupils' minds are seeking the answer to the question of how Washington met the problems attending the launching of a new nation. With such a preview, pupils can follow the teacher's line of thought more easily and can even anticipate the next turn in the lesson.

A standard of relevancy is set up by every effective aim. Both teacher and pupil now know what to shut out of the lesson. Most weaknesses of instruction can usually be traced to aimless teaching. So definitely should the aim be established that when irrelevant questions are asked, the class can at once perceive that they are not pertinent to the aim. Little by little, the children learn that even interesting facts must be repressed if they do not lead to the goal sought. Occasionally in socialized and laboratory recitations, it might be well to write the aim on the blackboard for the guidance and the warning that are implied.

Characteristics of an Effective Aim.—To attain the full measure of its values, an aim must foreshadow an experience that is necessary and satisfying. Every good aim supplies a motive as well as an objective. A second requisite is, that it be concise and simple in form so that it can be retained as a constant guide. Such aims as, "We shall now study about equilibrium," or "In this lesson we shall try to learn how to find what per cent one number is of another," must be condemned on all counts; they are not simple and direct and they hold no promise of knowledge that seems, to the pupil, either necessary or satisfying. Introduce the lesson

on equilibrium by asking the largest boy in the class to stand erect with feet together. Give him a slight push and he topples over. Now call on a smaller pupil and ask him to stand with feet apart and hands on hips. Push him with more force and he maintains his position with comparative ease. Every face gives evidence of genuine curiosity. The teacher's question, "What shall we learn in science to-day?" quickly brought, "Why did the smaller boy hold his balance better?" Every boy saw that the explanation would serve him in boxing and wrestling.

Consider the standing of the baseball clubs or the teams of the school and ask how the ratings are obtained, if one knows the number of games won and lost. At once, there is indication that the pupils want to know "how to figure out the percentages." The teacher restates the aim in more acceptable language and is assured of an attitude on the part of the class that will quicken the learning process.

Further Study of the Comparison and the Generalization.

—*The Values of Comparison.*—Directing the development of a lesson so that pupils associate the newly acquired facts with one another and with kindred old experience affords necessary incidental reviews. Questions calling for comparison stimulate thought and thus lead to more thorough understanding. Seeking likenesses and differences usually reveals those basic characteristics of experiences that justify the generalization. Despite its values, the comparison step may deliberately be omitted if in a particular lesson it seems forced.

The Pupil Bears the Burden of the Generalization.—Pupils usually find the formulation of the generalization difficult either because their understanding of individual experiences is inadequate or because their expressional vocabularies are too limited. A child classified the noun, *parents*, as a pronoun, because, "it stands for father and mother—for two nouns instead of one"; another insisted, "any part of a thing is a fraction" because "a fraction is something broken off a whole thing"; here are errors clearly traceable to limited comprehension. The formulation of a law or principle usually calls for a finer precision in the use of words than most people possess. The

statement of a generalization is, therefore, a composition exercise that requires no mean language ability. In the light of this analysis it seems reasonable to conclude that the pupils should give the thought content of the generalization and the teacher should suggest improvements in phraseology. The children who declared "A preposition is, therefore, a word that shows what business one part of a sentence has with another," gave evidence of comprehension; their teacher then indicated the necessary refinements of language.

How Should the Generalization Be Learned?—After a definition or a principle has been formulated, children should be required to learn not the set words but rather the constituent thoughts. In reciting they should give an original example first, then the generalization, phrased impromptu, but embodying the necessary ideas. After the definition of a preposition has been evolved, the pupils should learn (1) introduces a phrase; (2) shows relation. When called upon to define a preposition, they should (a) give an illustration, thus, *Early in the war, Pershing went to France, to*; (b) incorporate the distinctive ideas in a sentence of their own, "The preposition, *to*, is used to begin the phrase and to show what *France* has to do with *went*." In such an answer the children are not repeating parrot fashion a stereotyped formulation but are rather expressing their clearly conceived ideas about a language relationship.

Omitting the Generalization.—When the statement of the concept is long or when the primary aim is to develop skill in performance, the generalization may well be omitted. Nothing is gained by having children recite the long story of how to divide by 27 or how to get the square root of 5,025 or how to draw to scale. The pupil who can attain an accurate result within reasonable time has met, very fully, the requirements in these situations. A method of teaching must ever be an aid to the pupil or to the teacher; it must never be permitted to dominate a teaching situation. If therefore, economy of learning counsels the omission of either the comparison or the generalization step, then the method-whole must be curtailed accordingly.

Value of the Generalization Step.—Except in these unusual situations, the generalization step makes valuable contribution to the lesson. It is a ready and a reliable test of comprehension. As the pupils attempt to formulate the rule or the definition, the weaknesses in their knowledge come to the surface. Generalizing is an excellent mode of training in thinking. Apparently divergent experiences must be reconciled and all their common elements selected and bound into one complete thought. In the preceding steps of the recitation, pupils gather many impressions; in the generalization step they must give a single unified expression of their many and varied impressions. As a final value of the generalization, we must include the training it affords in the happy selection of those words that will express with utmost precision the meaning intended. Few formal language lessons can emphasize so successfully the importance of selecting the correct words as the generalization step.

Evaluation of the Method-Whole or the Inductive Recitation.—Liberally interpreted, the method-whole makes for effective teaching. It insures a systematic recitation in which each step prompts the succeeding one, always following one of the mind's natural processes. The entire recitation insures adequate reviews, helpful association of old and new, proper mind-set and attention to the application of knowledge. When employed in teaching small units of logically organized subject matter like rules of language, of spelling, of arithmetic, or of physical science, its values become apparent.

Objection to the method-whole rests on the fact that it is based on the maturely conceived logic of the teacher, never on the logic of the child. The pupils play no part in shaping the plan; they follow, understandingly but obediently, the path of the teacher. The charge is true and if the method-whole were used to the exclusion of other recitation patterns, this limitation would serve as a complete condemnation. In answer it may be urged that for the pupils some teaching must be a short cut across experience rather than a process of rediscovery. In such situations this inductive recitation is essentially sound.

Complaint is made that since no such nicely planned mode of learning is seen in the everyday experiences of life, then why employ it in class? Such a sweeping assertion may be challenged successfully. The small shopkeeper with limited experiences makes sad and costly errors. One season he buys his stock without adequate thought to the tastes or the purchasing capacities of his particular clientele; another season he overstocks with certain sizes; a third season he buys his stock without giving heed to early delivery. But the fourth season he conducts his business in the light of the lessons he has learned so expensively. This is life's method of teaching, natural and inescapable. Is it very different from the procedure advocated by the method-whole?

Dewey¹ and other opponents of the Herbartian recitation insist that induction and deduction cannot be isolated; that the two flow into each other; that "generalization is not a separate or single act," but, "rather a constant tendency and function of the entire discussion or recitation"; that in any difficulty other modes of thought, even trial and error, are employed; that either induction or deduction alone, is utterly inadequate. To all these statements every student must give assent. But an examination of the method-whole shows an intimate and constant supplementary relationship between induction and deduction and a freedom in the use of the recitation plan which makes it flexible and adaptable. If the ends can be attained more efficiently by beginning with the application step as we did in our illustrations of psychological approach or by omitting any of the steps, the teacher must feel free to do so. The method-whole, at best, is a suggested procedure, never a holy ritual.

The Deductive Recitation.—*Its Psychological Basis.*—We traced the genesis of a concept inductively acquired. But concepts may come to one without an analysis of individual cases; they may just be thrust upon one by circumstances. In the school shop, a child may find it necessary to know the length of the hypotenuse of a right triangle. His manual-arts teacher tells him the rule of the squares. When seeking

¹ John Dewey, *How We Think* (D. C. Heath & Co., 1910), p. 211.

advice from an older friend about connecting two dry batteries, he may be told to join the plus pole of one battery with the minus pole of the other and he may even be given the explanation, "like poles repel each other, unlike poles attract." In writing a letter during his vacation, his mother may correct his misspellings, *allso* and *allways*, and add, "when making a new word by building on the word *all*, always drop one *l*." Here are instances of concepts learned deductively.

But these generalizations convey at best a minimum of meaning. Not until the child squares the three sides of the triangle, or actually connects different shaped dry batteries, or actually applies the rule of spelling does he come to an adequate understanding of the new concepts. He finds some batteries mark only one pole, others both; some use the screw cap, others a clip; some are round, others square; some provide for the connection on top, others in the middle. Similarly he learns that *altogether* is correct but *alright* is not. Without the experience with individual cases, rules or principles remain empty words. In the inductive lesson, this experience comes first; in the deductive lesson, last. In the emerging conclusion, there is real knowledge.

Steps in the Deductive Recitation.—This analysis of the deductive genesis of concepts determines the organization of the deductive recitation which is presented in tabular form.

<i>The Step</i>	<i>Its Function</i>
1. Preparation : (a) Apperceptive Basis (b) Aim (c) Motivation	1. It is manifestly improper to begin a new lesson without paving the way for it by calling up necessary old knowledge, without indicating the purpose and without justifying the undertaking. There need be no difference between the preparatory step of an inductive lesson and that of the deductive lesson.
2. Giving the generalization	2. The law, definition, rule, or principle of the lesson is now given by the teacher or obtained from the class text.

3. Making the explanation, inference or application
3. The children now attempt to apply the new generalization. They may explain specific phenomena in terms of it. Having been given the law of the lever, they explain why the man with the crowbar can move weights altogether beyond his power without it. Having learned that latitude, altitude, distance from large bodies of water, prevailing winds, and surrounding topography affect climate, they take typical sections of the map of the United States and infer the probable climate of each region. Or, they may take their newly acquired rule for computing double discounts and solve a number of appropriate problems.
4. The verification
4. The children are taught the significance of the suspended judgment; they learn that an inference or an explanation is a tentative conclusion which must be subjected to the acid test of experience. Books are now consulted to ascertain the correctness of their analysis of levers or of their inferences regarding climate. Finding the cause of each error of judgment is extremely valuable training in thinking. Once more the emerging conclusion, after the verifications are complete, is regarded as accurate knowledge.

The Deductive Recitation Illustrated.—A seventh grade was to learn how to compute the area of a circle. The teacher asked the class to give the cubical contents of a tank having a rectangular base 9 x 12 feet and a height of 10 feet. The formula, "area of base times altitude" and the answer based

on it were quickly given. The problem was then changed—the tank was circular, having a diameter of 9 feet and the same height; will this change in form give the owner as much storage space for his water? The children knew that, to obtain the answer, “the area of the base should be multiplied by the height.” But how find the area of a circular base? They suggested that the day’s lesson in arithmetic concern itself with how to determine the area of a circle. The teacher had thus established an aim and provided a motive for the new lesson. To make sure that they would understand the new rule, the children were asked to review the necessary terms, diameter, radius, circumference, and the ratio between diameter and circumference, 1:3.1416.

The law for finding the area of a circle was then written on the board: $3.1416 \times \text{radius squared}$ or πr^2 , and the teacher explained that in later studies in mathematics, the reason for this rule would be apparent. Various problems were then solved but each answer was subjected to critical analysis. The area of a circle having a diameter of 9 feet was given as 63.61+ square feet by some and 6361.74+ square feet by others. What is the area of a rectangle 9 x 9? Will the area of the circle within this square be more or less than 81 square feet? They all realized that the second answer must be wrong, while the first seemed reasonable. The book was consulted and the correctness of the first answer was established. We did not label the successive steps in this lesson because the reader can identify them easily enough by himself.

When to Use the Deductive Recitation.—In dealing with short units of arbitrary subject matter or with procedures whose rationalization is beyond the comprehension of the pupils, the deductive procedure is advisable. For instance, rationalization is too difficult for young children in the teaching of long division, in teaching how to find the least common denominator, in the teaching of much factual history, and in teaching the recognition of the various keys in music. Since these experiences must, however, be learned early in one’s

schooling, the direct telling method seems advisable. When time must be made up, as with a class of overage children, or when teaching a prescribed topic that in the teacher's judgment lacks social value, the deductive recitation is again appropriate and helpful. The area of the circle can be taught inductively but the time required seems altogether out of relation to the value of the topic. Those who will pursue an academic course in high school will be given a mathematical explanation of πr^2 ; most of those whose schooling is to be of short duration, and those who are bound for industry or commerce have little use for the formula; hence teachers wisely decide to approach the topic as directly as possible and present a deductive lesson.

In every well planned deductive recitation, the procedure has psychological sanction. Motive and aim assure interest and helpful mind-set; the apperceptive basis facilitates logical associations; the third step reads meaning into the concept and the last step develops a useful attitude—the suspension of judgment until conclusive proof is adduced. Throughout the deductive recitation, induction mingles with deduction as intimately and as continuously as in any thinking that takes place in our informal daily experience.

II. RECITATIONS MAKING FOR PERMANENCE OF RETENTION

Drill and Review Lessons Illustrated.—A class completed the study of Japan by following the causal series. To fix the major facts, the teacher might have asked questions that follow the causal series. All the significant facts might have been elicited through such directions as, give the location and size of Japan; describe its coast and its topography; sum up the essential facts of its climate; give lists of its resources, occupations, products, exports, imports, and cities. This drill lesson would have aroused, at best, the pupils' interest in their individual performances but not in the geography of Japan.

To make the old subject more interesting in the dynamic sense, the teacher asked the class, "What justification is there

for calling Japan "The Great Britain of Asia'?" The pupils pondered, and then recalled Japan's location, its insularity, its proximity to the mainland, its climate, its resources, its chief occupations, its products, and its ports. They recalled all the facts learned in order to accept or reject the suggested comparison. This is a review lesson because it introduces a new view of known data.

In reviewing the topic, The Sahara Desert, we ask, not the obvious questions concerning size, location, topography, climate, and the like, but rather, "What harm may befall you in crossing the desert?" As the reason is found for each of the tragic possibilities, the essential facts are reviewed. The children who speak of death from thirst or starvation, tell of the limitless stretches of waste, the lack of water, the infrequency of the oases, the sparseness of the population, and the vastness of the territory. Others who mention the dangers of losing one's way or of death in sandstorms, explain these accidents in terms of the size of the deserts, the exceedingly dry, pulverized soil, the peculiar winds that sweep over the deserts, and the mirages. Little by little, every important characteristic of Sahara Desert is repeated again and again, not for the sake of repetition, but rather in the search for an answer to a new question.

A sixth-year class spent a whole lesson on, The Causes of the War of 1812. To impress these facts on the pupils in a succeeding lesson, the teacher might have asked, "How many causes of the War of 1812 did we note? Name the first. Give an illustration of it." Through these drill questions the topic would have been covered without any real interest or added significance. The teacher planned, rather, a review lesson which she introduced by writing on the black-board,

"The Revolutionary War gave us our political freedom; the War of 1812, our business freedom."

At first, the children seemed unable to deduce proof of this statement. A brief discussion led them to formulate a plan. They listed the causes of each war; compared them;

decided one group was concerned with political questions and the other with business matters. As they carried out their plan, they reviewed Right of Search, Impressment of American Seamen, Interference with Commerce, and interpreted these causes in a new light, thus deriving a new set of values.

A group of young children had studied the squirrel. The teacher in review did not require them to tell how the squirrel looks, where it lives, how it walks or runs, what it eats—the various aspects of the animal studied in earlier lessons. She asked instead, "What must you know about a squirrel if you wish to make a pet of him?" Every fact that is important about the squirrel was suggested in order to plan the most suitable cage, the proper diet—the regimen of the squirrel's life. The old facts were seen in a new relation which gave them added significance.

Frequently, a long poem or story that was read slowly in class is stressed by asking the children to reproduce the narrative, bit by bit, and to identify the characters, the most important incidents, and the most telling dialogues. For the children, the main interest in a story lies in the plot; this interest satisfied, the repetitions hold little for them. Give a review, rather than a drill. Let the children plan a pageant or a dramatization or a scenario for moving pictures based on the story. At once there is intelligent reason for going over the story and the characters, because decisions must be reached for such questions as: How many scenes shall we have? Where shall each take place? What part of the story will each scene give? How many characters must we introduce? What shall they say or do in each scene? How shall we convey to the audience the character traits of each person? The play need not actually be written; in the planning of it, the vital aspects of the story are reviewed and the child is left with a deeper and more sympathetic understanding of a literary work.

Drill and Review Lessons Contrasted.—We shall contrast the characteristics of these two types of lessons in tabular form. For illustrations of each element in the contrast, the reader is referred to the lessons set forth above.

	<i>Drill</i>	<i>Review</i>
1. Aim	1. To develop skill or reduce knowledge to the level of habit	1. To insure longer retention and greater thoroughness
2. Method	2. By exact repetitions	2. By presenting old knowledge from a new point of view
3. Amount Recalled	3. Every detail is recalled, and each is given equal emphasis, hence the organization remains unchanged	3. Only the essential facts are recalled and stressed according to their relative importance, hence a reorganization of subject matter takes place
4. Appeal	4. In the main, to mechanical association, hence memory	4. To logical association, hence thought
5. Spirit	5. At best, one of increasing monotony	5. As a rule, interest is aroused and sustained and the flow of effort is quickened

It seems reasonable to conclude, that when the same ends can be attained, reviews rather than drills should be employed. But in the learning of spelling, locational geography, factual history, number combinations, and phonograms, drill—rigorous and persistent drill—is inescapable. In such subjects as arithmetic, penmanship, fine arts, and manual arts, the educational significance of drill lessons is further intensified by the fact that they are designed to develop sets of basic skills.

Further Analysis of the Drill Lesson.—Since the drill lesson is designed to make necessary facts and reactions function as habit, the steps in an effective drill and those in habit formation are identical. Analysis of a drill recitation and of the process of habit formation should reveal the following organization:

1. *Understanding Must Be Assured.*—No experience should be reduced to habit unless it has been explained adequately. Whenever possible the phonetic difficulties in the new spelling words must be reduced; each unit in a table of measure must become familiar through actual use; the river systems of the

United States must be located on the map, their courses traced and their directions accounted for; the posture to be acquired must be demonstrated with utmost care and common faults of posture pointed out. Without the assurance of thorough comprehension, the process of habituation is greatly retarded.

2. *Motivation*.—Unless we have the pupils' earnest coöperation, habit will not be acquired. Occasionally children must be led to see the importance of the elements that make for legibility in penmanship. After the difficult part of each word in the spelling list has been explained, the class should be asked to spell the words. Their inability to make ready responses leads them to realize their need of drill. The facts of a table in denominate numbers having been taught, the class is asked to apply them in oral arithmetic work; poor results lead them to the conclusion that drill is necessary. So, too, in matters of conduct and health—proper table manners, modes of response, and correct standing and sitting posture—children must be convinced of the value of habituating the proper reaction. Of course, the motivation is not given in every spelling or in every arithmetic drill; occasional motivation may elicit a genuine response but regular motivation in these lessons becomes a monotonous ritual. Motivation is not concerned with making children like the drill but rather with helping them to perceive the need for it.

3. *The Repetitions*.—Mere practice will not develop habit. The repetitions must be *regular* and *frequent*, rather than merely numerous, and made with all the *attention* at the individual's command. These characteristics are discussed at greater length in the chapter on Laws of Learning.² To insure focalized attention, drill lessons should be reasonably *short* and *spirited*. Children should *not* be called upon, *in regular sequence*. Calling on pupils alphabetically or according to the seating arrangement of the class discourages attention on the part of those who have already recited; promiscuous calling keeps the class alert. And, finally, the matter to be habituated should, when possible, not be repeated in identical forms. Instead of asking for repeated spellings of certain words,

² See Chapters XXII and XXIII.

require pupils to indicate the crucial parts in the following words: *associate*, *nervous*, *guarantee*; giving *ci* for the first, *vo* for the second, and *gu, ee* for the third word is as helpful a form of drill as respelling the whole of each word. Seven times nine may be given as $7 \times 9 = ?$; $? \times 9 = 63$; $7 \times ? = 63$; at 7¢ each, what will 9 cost; what will 7 cost at 9¢ each? If 7 boys gathered 63 clams, how many will each boy receive as his share? Each variation helps to sustain attention and thus render the repetitions more fruitful.

Further Analysis of Review Lessons.—Every review lesson, by giving a *re-view*, an added interpretation, makes for greater thoroughness. Reviews can readily be given through *correlations*, *comparisons*, *new problems*, and *new applications*. In correlating the law of the lever with the law of proportion, two important facts, one of physics and the other of mathematics are reviewed; each means more because of the relationship established. When a poem studied in the literature period is sung in the music lesson, the correlation intensifies the message of the poem and the spirit of the music. In the exposition of the law of thoroughness in learning, ample illustrations of teaching through comparisons, new problems and new applications are given. The reader is now referred to them because they exemplify methods of review as well as methods of achieving greater thoroughness.³ Through these devices, reviews lead to new organization of subject matter, to a richer comprehension, and to a firmer grasp of the essentials rather than to the details of an experience.

SUGGESTED READING

See end of Chapter XXVI, that concludes the study of recitation patterns.

QUESTIONS FOR DISCUSSION

See pages 596-599, which contain problems on all types of recitation patterns.

³ See page 512.

CHAPTER XXV

THE RECITATION PATTERNS (*continued*)

III. THE RECITATIONS THAT DEVELOP POWER

The recitation modes, discussed in the last chapter, are concerned with acquisition and retention of knowledge. We turn now to recitations that admittedly aim to develop initiative and independence—power to direct one's own learning. One can tell pupils more facts than they can learn by their own observation or by their own study of the printed text; but giving information to children continually makes them too dependent on the teacher.

The Observational Lesson: The Laboratory Method and Field Trips.—*Psychological Basis.*—*Sense training and observation defined.* “Sense knowledge before thought” has long been a pedagogic maxim. With the development of modern pictorial representation—stereopticon and stereoscopic views, the cinema, the richly illustrated textbooks—observational lessons are acquiring added significance. The effectiveness of these visual aids in instruction is heightened for pupils whose senses and observational powers have been trained.

Sense training leads not to improvement in the sense organs, the eye or the ear, but rather to quickening the mental power to interpret more accurately what the sense organs bring. In ear training, the condition of the mechanism for receiving air vibrations remains unchanged, but the auditory centers in the brain become more expert in distinguishing and identifying the stimuli that come by way of the auditory channels. Senses that are trained, not only react more quickly and more accurately, but also detect smaller differences. After many manual activities in which children work with colored materials, their visual senses recognize the various shades of

each color with greater accuracy and speed and they are less likely to be confused by tints that merge almost imperceptibly into one another.

Observation is not aimless looking about. Seeing, as one sits in a rapidly moving train, an advertisement, a fellow passenger, the conductor, and perhaps a house in the fleeting landscape does not constitute observation, but mere acts of perception. When one notices the passengers about him and tries to identify them vocationally or socially by appearance, speech and behavior, he is observing because he is engaged in *a series of perceptions for a purpose*.

Characteristics of Trained Observation.—Good observation is functional; it concerns itself with perceiving not many details but rather the few that are significant. In the old object lessons, children were expected to look at a bit of glass and note that it was thick or thin, regular or irregular in shape, sharp or smooth, crystal clear or cloudy. But all these are accidental qualities. The trained observer sees that glass is transparent and fragile and overlooks all the other characteristics. The children who tell us that the rabbit has four legs, a fur coat, two eyes and two ears, a mouth and a tail, have not observed as well as the child who reported that it has a “funny mouth and a funny way of walking.” Here are summed up, crudely, to be sure, the distinguishing characteristics of the rabbit family. Young children, drawing a human figure, will often insert the buckles on the shoes and the buttons on the apparel but omit the neck or even permit the legs to grow from the head. Trained observation follows a plan and is guided by purpose. The crude observer looks about and in his haphazard way sees much. He has no purpose and his perceptions, therefore, lack intelligent sequence. These three characteristics of trained observation—establishing a purpose, following a plan, and selecting what is characteristic or functional—measure the degree to which observational lessons attain their educational objectives.

Educational Values of Training in Observation.—Trained senses give knowledge that is accurate. Many faulty judgments can be traced to lack of adequate sensory contributions.

Children who could find the cost of $1\frac{7}{8}$ tons at \$5.60 a hundredweight, did not know the meaning of a pound. True, they repeated with celerity, 16 ounces make 1 pound, 100 pounds make 1 hundredweight and 2,000 pounds or 20 hundredweight make a ton; but they did not know the feel of a pound. They were asked to place as many of their books on the palm of one hand as weighed a pound. Some stopped after putting a three-ounce blank book there, others continued until they had disposed of all their textbooks and looked about for more. Ask children who can obtain correct answers to problems in denominate numbers to tell you the height of a door, of the classroom, the length of the blackboard and at once the hollowness of the formula, 36 inches or 3 feet equal a yard, becomes apparent. Units of measure should be taught concretely and through use. Children should look intently at the ruler before them, should hold it between their forefingers, should read the successive numbers, and then with eyes closed and palms together, should, at a signal, extend their hands one foot apart. As they open their eyes they are usually surprised at the discrepancy between their estimate of a foot and the actual distance. These exercises should be repeated on successive days with foot and yard. Each day, a distance should be estimated visually and then actually measured. At the end of four weeks of such training, requiring never more than three minutes a day, children can estimate the height of a person, of a building, of an ordinary room—dimensions that are useful for comparative purposes.

Interesting experiences await the teacher who has never made inquiry concerning the mental content of the concepts his pupils recite so glibly. Ask pupils the meaning of a cord of wood; the answer is promptly given, 128 cubic feet. Continue the inquiry: will this classroom hold a cord? The answers show that children have attached no definite dimension to the words, 128 cubic feet. They are surprised when the teacher chalks a rectangle 4 x 8 feet in the corner of the floor and then indicating a height of four feet says, "This is the space occupied by a cord of wood."

What do words like isthmus and plateau mean to literal-

mind children who recite, "A narrow neck of land connecting two larger bodies of land," or, "A high table-land"? Many children admit that while they know the meaning of neck and land, they really cannot conceive of "A neck or a table made of land." And yet one expects them to reason from physical factors to economic consequences. We teach that the heart of the Iberian Peninsula is a plateau and then expect them to deduce some of the important occupations of the central sections of Spain. Children must learn the basic concepts of geography by modeling the important land forms and studying stereopticon views portraying them. Without this perceptual basis, adults as well as children live in empty worlds and merely mouth the conclusions forced upon them by teachers or textbooks.

Observation and sense training, adequately stressed, help us to look outward rather than inward. These teaching practices open the windows of the soul, and reveal to us the beauty and the challenge of nature. Education that fails to develop observation dooms us to live in a many windowed house whose curtains are drawn to shut out forever the panorama of life.

An overdeveloped inward attitude promises little of the joy of living. It encourages self-analysis and generates unhealthy discontent with oneself. The more one takes stock of his opportunities, of his successes, and of his failures, the more likely is he doomed to keen disappointment with himself. It is important that most people get away from themselves, for few, indeed, can tolerate themselves; that they cultivate, most assiduously, the outwardness of nature lovers, who though alone for protracted periods have capacity to lose themselves in the world without.

Organization of the Observation Lesson.—1. Our analysis of effective observation leads us to conclude that the observational recitation must begin with *clear recognition of specific purpose*. Too frequently one hears the teacher's announcement, "To-day, we shall show you pictures of Europe." A sigh of relief comes from the pupils who expected to be questioned on an assigned lesson. The teacher proceeds to show

pictures of cities, of famous buildings, of docks, of bridges, of small towns, of mountainous country, and of country toilers—in all from seventy-five to one hundred and fifty slides click through the machine. What a conglomerate of subjects! What a confusion of impressions!

In the study of the Panama Canal the class was led to the conclusion that no verbal description could make clear the operation of a canal lock. The teacher then presented five or six views of boats passing through locks and then a diagram and a crude cardboard model made of an old shoe box, showing the operation of a lock. The pupils observed intently, asked questions, watched the cardboard gates swing open, made a one-to-one correspondence between the objects in the photographs and the lines in the diagram and at the end of ten minutes felt that they understood what mere words were unable to convey to them. The observational lesson was not a relaxation; it was another mode of acquiring a very definite experience through a few well-chosen pictures and other visual aids.

2. As the lesson progresses, children must be directed to *observe* the *details* that are *characteristic and vital* depending upon the aim that is established. In the lesson described above, few children could tell whether the boats in the pictures were passenger vessels or warships, but all knew whether the ships were coming from an upper or a lower level and which gates were swung open first. Observation is a highly selective activity governed more by the objective than the actual details in the picture. Little by little, children learn not to see everything. We should banish forever such aimless practices as asking children to observe the mounted butterflies or the rabbit in his box and then requiring them to tell what they see. Some pupils usually see little, while others see much that is insignificant; in the end, very few really see what is significant. Unless teacher and class decide what to look for before the actual observation is undertaken, little will be gained from the experience.

3. In the *discussion* which follows the observation, children must be led to draw sharp lines between nonessential and

essential details and to draw such conclusions as seem warranted.

4. Finally, books must be consulted to verify inferences and to supplement the information—often felt to be too meager—that was gained through observation.

Suggestions and Cautions in the Conduct of Observational Lessons.—Pupils must ever be reminded not to permit *emotional bias* to color their observation. We bring more to the object to be observed than it can possibly reveal to us. Those who dislike chemistry see little in the same test tubes that fascinate their interested classmates. Observation is too frequently capricious and subjective.

Object teaching must never be confused with *objective teaching*. A lesson must not be taught solely because it affords opportunity to train in observation. Lessons in denominate numbers, science, physical geography, and drawing, taught for their intrinsic worth, become agents in stimulating sense activity and in training observation. Incidental training in observation through socially useful subject matter produces natural learning situations whose outcomes are significant and well balanced.

Wherever possible, *simple experimentation with its laboratory technique* should supplement observation. In the former, the pupil is the active agent, relying less on what is accidentally exhibited and more on the results of recombining and redirecting the elements in the situation. Experimentation requires greater activity, keener penetration, and greater initiative than observation.

Elementary-school teachers must not assume that the scope of their grade work does not permit recourse to the method of experimentation. Simple facts of diet can be taught quickly by direct telling, but better results are achieved by experimental feeding of white rats, accompanied by accurate observation of changes in weight and conditions of health. The law of germination can be taught by telling that seeds need light, air, sunshine, warmth, and moisture for germination; more effective teaching directs children to plant seeds in soil, on sawdust, and on wet blotters and then to subject these

seeds to a variety of conditions. Each day the observations are recorded and cumulative evidence is collected which enables the children to formulate the law of germination. Teachers will find the physical sciences, physical geography, hygiene, arithmetic, and the manual arts replete with situations calling for simple laboratory technique and affording golden opportunities for training in experimentation as well as in observation.

Field trips and *visits* to museums and to places of economic or scientific interest are excellent means of encouraging observation. But the promise of training that lies in these situations is often lost when the excursions are undertaken without a motivating purpose and in the spirit of a holiday picnic. In a properly organized school, a bus is as essential a part of school equipment as a blackboard. Before the trip is made, the class must be led to realize the need of going to see for oneself and to formulate the objectives to be attained. The preparatory discussion must lead to decisions concerning what is to be seen in passing and what is to be observed with care. The excursion over, stock must be taken of the impressions that were corrected and the ideas that were enriched by the actual contact with reality. Unless the class trip is construed as another method of learning, children will derive less intellectual stimulation from it than from the family outing.

The Recitation That Trains in Appreciation.—*The Psychological Basis.*—*Imagination defined.* Every well-conceived course of study plans for the refinement of emotions and the development of appreciative attitudes towards æsthetic and ethical experiences. But neither an emotion nor an attitude is a disembodied mental condition; the one is an aspect or tone, the other a mind-set of a particular mental content.

The mental activity that produces images or that combines images into old or new forms is called imagination. On occasions the mind repictures an experience exactly as it occurred. This form of image making is known as *reproductive imagination*; without it, memory of an event would be a mere power utterly devoid of form. Memory may, therefore, be

regarded as the retaining force, and reproductive imagination, the image-painting artist. Memory refers to a power; reproductive imagination to a result. In *creative* or *productive imagination*, images of selected old experiences are woven into new mosaics of thought. The most fanciful conceit is, hence, made out of the images of actual experiences. In the final analysis, imagination is conditioned by perceptual life, for we can image nothing that is entirely new. Congenitally blind or deaf people cannot imagine in terms of visual or auditory elements; they can have no image of color or of a melody; of necessity, they know fewer phases of life than normal people. It is not difficult to gauge the rare gift of Helen Keller's mind when we see the development it attained despite its eternal doom to silence and night.

Relation of imagination to thought and emotion. Progress, the result of invention and discovery, is produced as much by imagination as by reason. Guessing—intelligent not random guessing, to be sure—is at the bottom of every hypothesis, an assumed truth pending final verification. The scientist does not make chance experiments hoping to stumble on truth. He assumes a possible condition and seeks data that will either confirm or disprove it. Those in the vanguard of civilization—Copernicus, Galileo, Davy, Newton, Darwin, and Pasteur—had minds capable of a high order of creative imagination as well as reason. Our conclusion must, however, be tempered: although imagination makes reason more fruitful, it must not be given free rein lest it mistake fact for fancy.

The whole range of emotional life, from the most refined to the least desirable of experiences, is intimately associated with imagination. Social and æsthetic emotions stir appropriate imagery that is rich in content and suggestibility. But fear, anger, and hate create a background of images so vivid and controlling, at times, as to banish all reason.

Imagination plays its part in freeing us from the commonplace. Without it literature would be a "cold, insipid photograph of reality," and moral and social growth would be woefully retarded. Who can feel pity and show sympathy without picturing himself in the place of his unfortu-

nate brother? Who can understand the message of a master's work in music or literature without an imagination that is at once sympathetic and creative? It is imagination that frees us from personal bonds and transports us into realms whose highways and bypaths lead, not to ourselves, but to others.

Meaning of training imagination. The fabrications of children and the seeming reality of their dreads are often cited to prove that their imaginations are exceedingly active. Why, then, we are asked, should teachers concern themselves seriously with stirring up a process that appears to be in constant activity?

Imagination of youth is undoubtedly very active, but it is often reluctant to limit itself to reality or even possibility. In the imaginative world of the child, the law of gravitation is constantly defied; the wave of the fairy's wand turns the miserable hovel of the fisherman into a palace of gold and crystal. But the imagination that enriches life through invention and the creation of art concerns itself with the probable and the possible. To train the imagination is not to stir it to greater activity but rather to direct it towards ends that can be attained through any of the media of self-expression vouchsafed to mankind.

What Is a Recitation for Appreciation?—Recitations designed to develop socially approved attitudes or emotions towards experiences are known as recitations for appreciation. They do not imply blind acceptance by pupils of mature standards but rather a sympathetic understanding of and reaction to an æsthetic or moral appeal. They seek to give immature youth a set of values in terms of which it can measure the artistic and the ethical. They are, to quote Dewey, systems of "learning to prize experience."

Conditions Necessary for Recitation for Appreciation.—Lessons planned to develop appreciative attitudes cannot succeed unless the class is emotionally conditioned for appropriate reaction. A class returning from an athletic contest is not emotionally prepared to respond to the appeal in Kingsley's *Three Fishers*. Either the lesson must be postponed or the

class must be invited, through proper approach, to consider the dangers of those who must toil "though storms be sudden and waters deep." Not until the pupils have talked about the common tragedies of fisher folk should the poem be studied, or even read.

Appreciation is conditioned by an adequate knowledge of both the circumstances and of the technique of the artist. Children must know the story of the poem and must be led to perceive the skill with which the poet early foreshadows the tragedy, and with which he pictures, indirectly, the home relations of the fishermen and the hazards that they must face. Young pupils must be taught that story writers portray character by telling us what their people do, or letting us hear what they say or what is said about them. These children must then find instances in the text of each mode of character delineation. In similar ways they must be led to understand the meaning of suspense and other devices by means of which the writer works up to his climax; the significance of color words in description; the indirect descriptions and how they are suggested; the use of dialogue to further the story or reveal character; the dramatic values of contrast and climax—the skills that make up the writer's art. The pitfall in teaching language technique is overanalysis which attempts to focus attention on the meaning of new words and on the significance of all literary and mythological allusions. Few people are charitable enough to have forgiven their Latin teachers for the relentless dissection with microscope and scalpel of each classic studied. No such detailed study is considered in the advice that children be given an insight into the technique of the artist.

Without free flow of suggestions and criticisms and ample opportunity for talking together, lessons for appreciation become formalized and usually fail. The recitation must be socialized to a degree that turns the class in literature into a literary club or reading circle.

Special Devices to Quicken Appreciation.—Reading aloud to pupils, letting them listen to good music sung or played, encouraging them to sing such poems as have been set to

music or to improvise suitable melodies of their own, vivid visualization of a scene or a circumstance presented by a writer, membership in after-school clubs organized to develop special interests, recommendation of popular musical concerts and of suitable lists for home reading, visits to art galleries and museums, active participation in dramatics, and much classroom dramatization—these are some of the devices that may be employed to develop appreciation of experiences genuinely æsthetic and social. Most of these suggestions are self-evident; we shall, therefore, discuss at length only two of them, visualization and dramatization.

Quickening appreciation through visualization. In the teaching of the social sciences, innumerable situations arise that are meaningless to children unless they are helped to build up a very human background. Through history we are expected to transport the child into the past and help him to feel the great emotions of the race by reliving its most dramatic episodes. This purpose is often lost in a web of cold facts, soon to be forgotten. The colonial period is not understood unless the children can contrast the life of that day with the life of this and see, in their minds' eyes, the towns, the farms, the domestic character of industry, the muddy roads, the primitive means of transportation and communication, and the lack of our everyday comforts and of modern sanitation.

In a lesson on the industries of the United States, the children showed themselves masters of the facts. They knew not only the list of representative industries and occupations but associated each with its specific region. Two important aspects of the subject were entirely neglected: the causal relationship between industry and locale, and the human contribution to the development of any industry. The pupils did not understand why textile industries developed in certain parts of New England; neither did they understand why iron is mined in Minnesota while steel is made in Pittsburgh. An industry, to them, was a deliberately planned activity without reference to the raw material or to mineral deposits or to transportational facilities. Nor did they know

the human factor in the conduct of an industry. They were not asked to visualize the steel foundry, nor the subterranean world of the miner nor the storm-tossed and fog-bound fishing vessels. Each of the key industries should be taught in a separate lesson in which the child learns something about the skill required of the laborers, about working conditions, about the attending hazards, about the annual cost in terms of human life and health, and about the protection that a socially minded government can and does afford its workers. Gradually there would then emerge in the mind of the child a picture of a highly integrated society in which each of us holds a sacred trust—the happiness and life of his fellow beings. But in the pressure of classroom routine, such opportunities to make history and geography live are neglected and progress is measured by the glib recital of cold facts torn ruthlessly out of their human association.

In the teaching of the arts—representation, design, and music—formalism is often permitted to kill their spirit. In many courses of study, far too much stress is laid on drawing technique and too little on appreciation of pictures. The detailed analysis of the proper drawing of the ear of a cup, and the placing of the handle on a fruit basket is appropriate for those who may specialize in drawing but not for all pupils. The study of the great masterpieces in oil and marble should be given an important place. Courses in music, too, often neglect song in the pursuit of dotted quarter notes, key signatures, and the like. In nature study, the parts of a leaf and the cross section of a tree are typical of the type of material that banishes all hope of achieving the humane objective in nature teaching—the inculcation of a sympathetic and appreciative attitude towards nature.

Quickening appreciation through dramatization. Emotions have identifying forms of physical expression, such as changes in the rate of respiration and in the tonicity of muscles, the clenched fist, the moist eye, the lump in the throat, and visceral disturbance. In the study of emotions, we saw that changes in bodily posture may induce changes in the prevailing mood. To help children image a situation and respond

sympathetically to it, we often ask them to become a participant—and to make use of dramatization.

But unusual care must be exercised not to dramatize a situation that the unaided imagination can construct more clearly and vividly. A favorite historical incident selected for dramatization is that of Columbus before the court of Spain. Two pupils take the part of the sovereigns, a third, of Columbus, and a fourth, the prime minister; a group behind Ferdinand and Isabella impersonate the jeering courtiers. Columbus asks for help, gives his reasons, answers the doubters and the queen brings the incident to a melodramatic close by offering her jewels. Does not this demonstration offend the imagination? Show the children a reproduction of the famous painting of Columbus before the monarchs of Spain and describe the setting to them. At once the artist within each mind creates a real palace of marble and gold, places two real sovereigns on real thrones, surrounds them with real people of the court in gorgeous array, awed by the presence of their king and queen. In this scene Columbus is introduced pleading his cause with the dignity that springs from an overwhelming conviction. Given free sway, each imagination paints a picture in keeping with the spirit of this dramatic incident of history. With the dramatization before them, the imaginative activity of the children is inhibited. What is gained by dramatizing Valley Forge or the signing of the Declaration of Independence? Will the sight of children sitting on the floor of a steam-heated classroom, warming their perspiring hands on an imaginary fire quicken their appreciation of the sacrifices made by these men? Will the signing of a long sheet of wrapping paper by pupils who pretend to be Franklin, Hancock, or Randolph increase their admiration for the courage displayed by the patriots? Have faith in the imagination of youth. Describe the sufferings and the discouragement of the men at Valley Forge and at once each mind creates a real winter, feels the cutting winter winds and relives the sufferings and the agonies of that small army under Washington. Explain that the significance of signing the Declaration of Independence lay in identifying oneself with

the rebels; that in the event of defeat, these men might have been hanged; at once each imagination is fired and the scene is clothed with appropriate solemnity. Needless dramatizations that produce situations far inferior to those that imagination can create do great harm; they paralyze the wings of fancy and make a commonplace out of an incident vibrant with dramatic possibility.

Dramatization, as was stressed in an earlier chapter, helps when comprehension is endangered, when an emotion must be induced or when more expressive speech or oral reading must be developed. But not every situation is appropriate for dramatization. Are we helping imagination by dramatizing Old King Cole? The child who plays the part of the jolly old soul sits frightened on the teacher's chair and calls meekly for his fiddlers three who appear and fiddle on imaginary fiddles. Effective oral reading by the teacher and enjoyment of some of the delightful illustrations of King Cole by the children act as stimulants to eager imaginations. What classroom exhibition can compare with the picture that is at once created in each mind? Superfluous dramatizations are like elaborate toys—they give too much to the imagination and leave nothing for it to do. Stifle imagination and you have stifled the appropriate emotional accompaniment.

We have dwelt long on improper dramatization. But school curricula are replete with occasions in which dramatization is extremely helpful. In teaching new expressions, like *akimbo*, *trudge*, *knit brow*, and *gait*, the performance of the suitable action does more to convey meaning or to test children's comprehension than long expositions. In civics, the organization and function of governmental agencies are difficult to teach without suitable motorization. The issues in the historic debates take on new meaning when redebated in class. Not unless children actually write out checks, pay bills with them, endorse checks, make out deposit slips, and make deposits in school or class banks do they really understand these simple business transactions. For most children the full dramatic force of such incidents as the church scene in *Evangeline* is lost without dramatization. Properly

employed dramatization quickens imagination, insures emotional response, sharpens comprehension, and makes speech more natural and expressive.

The Organization of the Recitation for Appreciation.—Unlike the recitation patterns we have studied heretofore, the recitation for appreciation has no distinct set of well-defined steps. Frequently, one of the other recitation modes, suitably modified, is employed to inculcate a desired attitude. The distinguishing aspect of the recitation for appreciation is its æsthetic or ethical objective, rather than its formal organization into formal steps.

Cautions in the Recitation for Appreciation.—Teachers must guard against empty sentimentality and a false attitude that is little better than hypocrisy and pretense on the part of the class. Pupils are prone to say what is expected of them and keep their thoughts to themselves. As far as possible, we must not tell children what to approve. We may tell them, to be sure, why people approve a particular work of art or a certain mode of behavior but we should urge them to express their own opinions. In all these lessons for appreciation, we have no instrument for gauging the genuineness of the pupil's response nor of determining the superiority of the teacher's standards. Color combinations held in disrepute only ten years ago are to-day hailed as the harbingers of the new art. The unsophisticated æsthetic judgment of the child, so often ruthlessly suppressed, may come closer to the accepted standards of art of to-morrow than we suspect.

The Study Recitation.—The ability to make himself superfluous to those whose behavior he seeks to influence is the measure of the final worth of a teacher or a social worker. By this standard, the importance of the study recitation looms large because in acquiring adequate skill in study, the child is growing in initiative and in power to find his knowledge independently of his teachers. Study, whatever its form, is the voluntary application of mind for the attainment of a goal that seems worthy. Without comparatively vigorous application and self-direction, on the part of the pupil, there can be no genuine study.

Children Lack Ability to Study.—An old misconception. Those in intimate relation with pupils of adolescent age are in substantial agreement concerning common lack of study technique among these children. This inability to study may be traced to many factors. Too many teachers believe that skillful teaching will, of itself, develop power of study. This position they bolster up by two assertions: (1) that good teaching is inspirational and arouses an urge for independent pursuit of a subject; (2) that children are imitative and reproduce, in their own work, the teacher's mode of selecting and organizing data and of arriving at conclusions. But arousing a desire to study does not insure ability to study. Children are imitative, but, in their immaturity, they imitate the teacher's physical attitudes and postures rather than her mental processes. Let the teacher unwittingly hold the chalk between forefinger and index finger and at once half the class attempts to write by holding pencils similarly. But the imitation of the teacher's thinking requires keener intellectual interests than most high-school pupils exhibit.

To the layman, a good teacher is one who is a master of his subject, presents it in orderly and nicely graded sequence, illustrates each new step by an experience taken from the life of his pupils, explains away each succeeding difficulty by making it an outgrowth of the preceding facts, and, finally, unfolds the panorama vividly and interestingly. But throughout this type of instruction, the child is following the leader, his teacher, who blazes the trail to be trod by the pupils. In study, on the contrary, the pupil must assume leadership in a seemingly pathless wilderness of fact. Will a faithful follower become a good leader? Teaching and study are, for the child, two learning activities almost diametrically opposed in spirit and method. The pupil whose school day is given completely to being taught is, in no small measure, mentally pauperized. The old fallacy that effective classroom instruction must of itself develop desirable habits and skills of study persists and is responsible for a school program that is niggardly in its provisions for the development of the art of study.

Factors that make study a difficult process for children. Aside from the fallacy we have just discussed, there are other factors that explain the difficulty children experience in attempting to study. Chief among these may be mentioned: (a) the unfamiliarity with the process that requires a relatively vigorous personal application to a need; (b) the lack of selective and critical judgment that leads to the elimination of some facts and the challenging of the text; (c) youth's subservience to authority, especially to that of the printed page; (d) the lack of intellectual interests and the resulting short span of attention; (e) limited knowledge of any subject that makes acquisition of added data difficult; (f) inability to read serious text intelligently because of the paucity of their vocabularies. To these causes, others may readily be added, but the conclusion for the teacher is inescapable—the art of study must be taught, with utmost patience, through a variety of graded exercises and, even then, the child's progress will be slow. In the grades, teachers frequently announce, "This is your study period; take out your books and study." The children are quick to take advantage of such an opportunity to complete their homework in school hours. In the high school, the daily study period is usually a period of enforced attendance in the study hall where pupils may use their time as they please so long as they maintain order. If the study periods were seriously devoted to the purpose for which they were intended, assignment to the study room would not be a free period for the teacher in charge. On the contrary, teaching to study requires arduous preparation and skillful guidance of pupils.

Types of Study Lessons.—There are many forms of study but a complete enumeration of them would serve no practical purpose. For classroom needs, we may distinguish four distinct types: (1) the *drill type* in which formal subject matter must be memorized and reduced to the plane of habit; (2) the *laboratory or manual type* in which specific facts are acquired by experimentation or by the creation of an object; (3) the *assimilative reading type* in which text is critically analyzed or a problem is solved by the aid of the knowledge

presented on the printed page; (4) *the mixed type* which combines the preceding types and makes adaptations of them as circumstances demand. In its turn, each of these forms of study will be analyzed and its methodology indicated.

The Drill Type of Study.—Let us assume that the important cities of a geographic unit have been identified, and the factors that account for the growth of the largest ones carefully noted. The teacher may then suggest that the children study the location of these key cities. Similarly, after adequate preparation, we may lead up to such assignments as, "Study these ten words commonly found in business letters but frequently misspelled by you," or "You must now learn the fractional equivalents of certain percentage forms so that you may save yourself much time and effort." The direction seems simple enough but inquiry proves that children do not know what to do even though the class drills embody all that is helpful in the psychology of habit formation. Teacher and class must, therefore, in socialized discussion, evolve the following questions of guidance for drill lessons:

1. Do I understand what I am to memorize?
2. What is my best method of memorizing? By writing the material? By looking at it intently? By hearing myself say it over and over? By looking at it for a moment and then trying to see it all on an imaginary blackboard?
3. Do I permit my mind to wander or do I keep it intent on what I am trying to memorize?
4. Do I test myself before deciding that I have successfully learned the lesson?

As each assignment is made for the drill type of study, these questions are reviewed until the children understand all the implications. At first, this guidance is followed consciously, but with repeated practice it becomes second nature and the child's study shows intelligent conservation of attention and utilization of the simple rules taught by the psychology of memorization.

The Laboratory Type or Manual Type of Study.—By definition, study is not confined to memorization of formalized

facts and the mastery of the printed page. Pupils who have been given an introductory lesson on air pressure may be asked to perform certain experiments and evolve the explanation for the phenomena they observe. A class was asked to stand a milk bottle on its mouth in a dish partly filled with water and then to repeat the procedure with a burning taper floating on the water but confined by the neck of the bottle. The pupils were startled to see the water rise in the bottle as the flame died out. They thought deeply in their attempt to evolve an explanation and then consulted their books to verify their tentative conclusions. Although much was done and comparatively little was read, this lesson constituted an act of study. Such an assignment as modeling a map to show topography or river and lake systems must also be regarded as a mode for study because it requires voluntary application of mind to a task that seems necessary. Without proper preparation, assignments of this type do not invite solution.

Studying by Assimilative Reading.—*The method of assignment.* The most common and the most difficult type of study requires critical reading of text. Let us suppose that after the proper approach, an assignment was made, not by reference to pages or to numbered paragraphs but by topics and subtopics, thus: "Study the colony of Georgia; be sure to find out: (1) why the colonists came; (2) the character of their leader; (3) how they bore their first hardships; (4) their progress after the early months." Such an assignment gives the pupils centers around which to group their facts and a helpful standard for gauging the probable success of their study. A mechanical assignment in terms of pages is, to most children, an invitation to memorize the text and leaves them not only without a scaffold for their facts but also without any means of determining whether they know what is expected of them.

Development of a method of procedure. The first subtopic introduces the study recitation. Children usually agree, "The first thing to do is to read the paragraph for understanding." They further agree that the next step is "to learn it." Questioning soon reveals that by "learning it," they

really mean memorizing the paragraph verbatim and that they have no conception of study as a selective process. To drive home the utter futility of attempting to memorize, use the method of *reductio ad absurdum*. "Here is a larger book," says the teacher; "to study more thoroughly what shall I do with the text of this book?" The answer, often promptly given is, "Memorize that too." "And with the two dozen books on the reference shelves of our library?" persists the teacher. In the hesitation that follows there is evidence that the children are beginning to realize that memorization is not the correct procedure in this kind of study.

To teach that study involves generous and courageous elimination and to develop the concept, "important facts" require many weeks of nicely graded instruction. An initial lesson was devoted to listing all the reasons why the settlers of Georgia came to the New World. The class textbook and the more difficult reference books on the teacher's desk were consulted. The results of the analysis were set forth, in parallel columns, as follows:

Class Text

1. Reason for settling Georgia differs from that which led to the founding of any of the other colonies
2. Debtor's Law of England
3. The injustices that followed
4. Oglethorpe decides to help these people
5. The Crown gives them a grant of land
6. Settlement of Georgia in 1732, the year of Washington's birth

Teacher's Book

1. Settlement of Georgia is an unusually interesting story
2. Laws may sometimes punish wrong people
3. Debtor's Laws of England
4. The hard lot of the honest debtors
5. Life in prison
6. Oglethorpe secures a grant of land to found a new home for these people
7. The settlement of Georgia in 1732

In the socialized discussion, the class concluded that while the two treatments differed, they both gave certain facts; that the common facts must be the important facts; that certain sentences like the introductory ones contain the obvious

that need not be learned; that other sentences, like number 5 in the teacher's book, are inserted to repeat an idea; that only the ideas found in all the books, the important thoughts, need be selected for learning. In this concrete way did the class learn the meaning of the term, "important ideas." In succeeding study periods, paragraphs were selected from representative books and their component ideas evaluated; these were then either accepted for study or rejected. This practice was continued until the children gave evidence of acquiring selective judgment. Other exercises were devised; among them, are the following:

1. Supplying a title for each paragraph in a story or an exposition

2. Reducing newspaper stories to half their original length

3. Finding topic sentences in a series of paragraphs

4. Answering questions based on a specific text; this device should be used in the introductory period only because the teacher's questions do for the pupil: what they ought to do for themselves, namely, decide on what is significant

5. Reducing a newspaper story to a telegram of a given number of words

6. Indicating the logical sections of a story or exposition and supplying an appropriate title for each section.

Each exercise is designed to train in intelligent selection and elimination.

After weeks of practice, the class then returned to the initial problem, "How to study a text." In a little time the following procedure was formulated:

1. Read for understanding

2. Select the important ideas

3. Learn them by listing them in outline form

4. Follow the same procedure with each succeeding paragraph

5. Add to the outline until the assignment is concluded

Questioning the text. This mode of study is not complete and is not advocated for the older student. Not unless we adopt a critical attitude towards the text and challenge each

of its conclusions are we really studying. But our present concern is with the young pupils who have neither the maturity of mind nor the basic knowledge requisite for intelligently questioning any book worthy of a place in the school. Critical study with mental aggressiveness must be postponed for students of high school and college grade.

The Meaning of Supervised Study.—School men give no evidence of having agreed on a definite conception of supervised study. All use the term but each thinks of it in terms of the practices in his own school. Brownell¹ gives a list of fourteen typical activities that constitute supervised study and Hall-Quest,² seven. Upon analysis, all these modes of supervised study are ways of working with, not for the pupils, and of substituting individual learning for mass teaching. In supervised study, teachers seek to direct effectively the learning activities of their pupils.

Some Common Practices in Supervised Study Periods.—The activities usually observed in supervised study do not all promote the purpose we have just formulated. Many teachers spend the period in teaching children how to study. We may assume that a time will come when this technique will be acquired. What these teachers will do then is difficult to predict. Others give individual help which soon becomes a coaching process. Much good is undoubtedly done in these personal conferences, but they consume much time, and with fairly large classes the intervals between these conferences, are, of necessity, very long. Some teachers devote these periods to helping children find essentials in the text assigned for home work. This is a worthy purpose, but it cannot be justified as a regular practice. Unless the children make their own decisions and selections, they are really not studying. Many supervisors report that their teachers, "Study with the pupils," in the supervised study periods, but the precise nature of this activity is not made clear. It is

¹ W. A. Brownell, "A Study of Supervised Study," Bureau of Educational Research, Bulletin No. 26, University of Illinois, 1925, Ch. ii.

² A. L. Hall-Quest, *Supervised Study* (The Macmillan Co., 1916), Ch. v.

probably another way of referring to one of the practices already enumerated.³ The *Dalton Plan* and the *Winnetka Plan* may, in a sense, be regarded as elaborately devised systems of supervised study. These techniques are set forth more fully in an earlier discussion.⁴

The most acceptable of the plans reported is the *Divided Period Plan* in which a period decidedly longer than any devoted to regular teaching is divided into three parts, (1) the assignment and the plan of procedure; (2) individual study under supervision; (3) the recitation. The function of each of these three parts, suggested in a general way by their respective titles, will be elaborated in the following discussion.

Steps in a Supervised Study Lesson.—1. *The assignment.* A study lesson should be introduced with as much care as a well-planned teaching recitation. The assignment should have its origin in a need revealed in class experience and clearly set forth in a statement of purpose. The class must know definitely what it is expected to accomplish and why. Unless we look for something definite we find nothing. The assignment has aim and motive when the teacher says, "These are the words you missed in the dictation lessons of the week; we must learn how to study them," or, "Now that we have traced the progress of Grant's Campaign, you must learn how to study the important facts for yourself," or, "We now know why the days are longer in summer than in winter and what is meant by daylight saving; I shall ask you to find, in this pamphlet, the reasons that prompt city workers to favor daylight saving and farm workers to oppose it."

The assignment may be made at the end of a teaching period or in the middle of one or it may be reserved as the introductory step of the study recitation; in a word, whenever it seems most natural and necessary. Wherever possible, the assignment for the whole period should be followed by short allotments of work requiring not more than five or six min-

³ Compare with results of a questionnaire reported in *Supervised Study Plan of Teaching*, by Shreve (Johnson Publishing Co., Richmond, Va., 1927), p. 52.

⁴ See pages 338-341.

utes each. To make a single assignment of work for, say thirty minutes, creates many problems. To some children a half hour is an incredibly short time; they rush through their work, complete it imperfectly, and then waste many precious minutes. Others regard a half hour as an interminable stretch of time; these children dilly-dally and accomplish only half the task in the given period. The short allotments of work alternating with discussions based on the facts gleaned produce more satisfactory results.

Discussing the mode of procedure. After a definite and motivated assignment is made, teacher and class should discuss the merits of various possible procedures for attaining the goal. In a dictation lesson some children wrote *salable* and others *saleable*, some *receiveable* and others *receivable*, but all wrote *taxable*. After the assignment was stated, the class, under the teacher's guidance, decided on the following plan of work:

1. Make up as many *able* words as possible
2. Look up the spelling of each in the dictionary and then make the necessary corrections
3. Formulate a helpful rule
4. Self test on the spelling of *able* words

These discussions of projected procedure often arouse sharp though friendly differences of opinion and lead to that spirited exchange of ideas that is so sadly lacking in the formal oral composition lessons.

2. *Individual learning or study.* Each child now sets to work to carry out the plan that was suggested. The children should be discouraged, judiciously but persistently, from asking questions lest they shift their small burdens to the teacher and disturb those who are bent on working out their own problems. It is important to announce a time limit so that the pupil may form the habit of giving himself completely to his task.

3. *The recitation.* When the time allowed is used up, all individual study should be discontinued. Questions may be asked to test the children's knowledge or to determine the

wisdom of their selection of ideas. Children should be encouraged to suggest questions as well as to answer them and to bring about as free an exchange of opinion as the circumstances will permit.

The Study Recitation Evaluated.—Empirically, it seems reasonable to conclude that properly organized study recitations give the pupils systems of study and develop effective study techniques; that they foster a spirit of self-reliance; that they train in the art of concentration; that they inspire the confidence necessary to disregard, deliberately, some of the facts on the printed page; that they teach how to organize data and how to arrive at conclusions. These study recitations seek to attain the highest professional aim of teaching, to develop in each pupil the power to obtain for himself the heritage of knowledge the race has bequeathed to him. But these claims are little more than expressions of personal faith, and are not based on objective data derived by scientific testing. In truth, we have yet to devise accurate instruments for measuring the results of study.

SUGGESTED READING

See end of Chapter XXVI, page 593, which concludes the discussion of recitation patterns.

QUESTIONS FOR DISCUSSION

See end of Chapter XXVI, page 596.

CHAPTER XXVI

THE RECITATION PATTERNS (*concluded*)

The Problem and Project Recitations.—*The Meaning of Problem.*—Any situation that challenges the mind and invites solution is a problem. So long as knowledge and skill are adequate in any circumstance, no problem will arise. Problems arise only when there is a conflict in experience.

In writing a friendly letter, the pen runs on as we try to keep pace with the flow of thought. Inadvertently we may begin the word *English* too close to the end of the line. The habitual reaction, divide it by the use of a hyphen, suggests itself. A writer may stop after *En* and ponder, "*Eng-lish* or *En-glish*?" His ear begins to play him false and he cannot be guided by auditory impression. He falls back on other *ng* words: "*singer* is pronounced *sing er* and *finger*, as *fin g er*; are *singer* and *finger* syllabicated the same way?" Here is a problem that arises in the realization of the inadequacy of habitual knowledge to meet a new situation.

Types of Problems.—Problems differ markedly in nature and purpose and give rise to a variety of types. We shall name the most important of these with brief illustrations of each.

<i>Type of Problem</i>	<i>Illustration or Explanation</i>
1. Selective Recall	1. Name the tariff bills in the history of the American tariff that caused bitter disagreement between the North and the South; between the East and the West.
2. Comparison (a) In respect to a single characteristic	2. (a) Compare Germany and France with respect to natural resources. Compare the message

<i>Type of Problem</i>	<i>Illustration or Explanation</i>
	of two poems, two plays, or two short stories.
(b) In respect to all characteristics	(b) Compare England and Japan with reference to all their physical features.
3. Cause and Effect	3. Account for the rapid growth of Japan and England and the slow growth of Australia in terms of proximity to or remoteness from the mainland.
4. Statement of Explanation	4. Why did England under George III seek to limit the development of manufacturing and shipping in the colonies? Why should multiplying by a proper fraction make the product less than the multiplicand?
5. Classification	5. Having studied the probable origin of the Hawaiian Islands, Newfoundland, Cuba, and the Azores, name two causes of island formation.
6. Opinions as to (a) adequacy; (b) approval; (c) relationship; (d) justice, etc.	6. Was John Brown right in carrying on propaganda against slavery? In taking up arms to force his views? Should he have been executed for what he did? How far may a citizen go in advocating his views?

Psychological Basis of the Problem Recitation.—Dewey's analysis of the process that the mind follows when challenged by any experience has been popularized and has provided teachers with a series of steps for problem recitations. A child who placed a pitcher of ice water on the table was surprised to find, a few minutes later, that the outside surface was decidedly wet. He was sure that the pitcher was absolutely dry when he placed it on the table. What he said in explanation of how he solved the problem is here set forth in his own words as accurately as the writer can recall the

experience. The lad continued, "I asked myself what caused that? At first, I thought that perhaps some one wiped the pitcher with a wet towel but I soon saw that could not have happened because no one had come into the room and, even if some one had, why would he do that? Then I thought that the pitcher was made of leaky material but I realized that was foolish. I simply could not explain it until I thought of the wet window panes in winter and then I recalled what we had studied in the science class. It must be the condensation of the moisture in the air touching the cold surface of the pitcher, I decided, just as the moisture of the warm room is condensed on touching the cold window pane in winter. This will make an interesting report to the science class. But I had to make sure of the facts so I put lukewarm water into the pitcher and the outside remained dry but when I tried ice water it soon became moist again. I thought that perhaps my science book might help me. I hunted up the paragraph about the windows in winter and, sure enough, on the next page was an explanation of why the outside of an old ice box sweats in summer. Then I knew I was right."

Here we have a record of a line of thought that was initiated by a conflict in experience, the dry surface of a pitcher turning wet. This led to the formulation of the problem, "Why did this happen?" Various explanations were evolved, each was examined only to be rejected, until a reasonably sound hypothesis was reached. But the mind being concerned with the situation sought to verify its conclusion and continued to do so until it was thoroughly satisfied. The steps in the child's thinking seem to have been:

1. The conflict in experience; the inadequacy of old knowledge to explain a phenomenon; the challenge
2. The formulation of the problem
3. The attempt at solution by weighing various explanations
4. The selection of a tentative conclusion that seemed most reasonable
5. The verification.

These natural steps taken by the child's mind without direction from a mature person who knows the simple facts of

condensation, give us the organization of a problem recitation.

Problem Teaching Illustrated.—A social science class was about to begin the study of the history of the immigration policy of the United States. Instead of presenting a chronological story far removed from the life of the pupils, the teacher approached the lesson by reading aloud newspaper accounts of monster mass meetings held in the larger cities of Japan to protest against the action of the United States in setting aside the gentleman's agreement in the matter of immigration, and then adopting a resolution in Congress excluding the Japanese. The gentleman's agreement was explained and at once the children asked, "Why exclude the Japanese? Why exclude others?" In answer the teacher read newspaper clippings showing the hardship entailed upon foreigners by our quota law. The children were puzzled; they had always regarded the United States as the haven of all the oppressed. The conflict that arose in their own experience led them to formulate the problem, "Why not let in all who want to come here as we did in the early days?"

The restriction of immigration as it operates under the present law and under the exclusion laws was explained. "But why restrict immigration?" the class persisted. Under the guidance of the teacher, various possible reasons were elicited:

- (a) We have no more land for newcomers
- (b) We have no work for newcomers
- (c) Foreigners make up the criminal part of our population
- (d) Foreigners do not know trades and cannot support themselves
- (e) Many foreigners do not become loyal citizens
- (f) We no longer have the kind of work foreigners can do best

The discussion that followed brought out the truth or the falsity of each of these statements. The children concluded that while our cities were crowded, we still have vast stretches of sparsely settled land; that at certain seasons, unemployment is extensive and its attending hardships would be increased were we to add indiscriminately to the population; that foreigners do not necessarily make disloyal or delinquent citizens and that many of our best citizens come from immi-

grant stock. Out of all the talk came the conclusion that the lawmakers believe that when we were still a frontier country we had unlimited assimilative power but to-day we can absorb only a comparatively small number of selected people. Two periods were devoted to this discussion which was based not on mere hearsay, but on regularly assigned readings. The conclusion that was finally evolved as a reasonable explanation of our immigration policy was modified in the process of verification. In this recitation pattern, the teacher followed a definite plan of organization which reproduces the mind's process in meeting the challenge of certain types of new experiences.

The Project Illustrated.—A composition project. An examination of a semester's work in composition of the traditional type reveals a set of wholly unrelated exercises. Yet, this work is not at all haphazard; on the contrary, it was carefully planned. The first week the children wrote a letter inviting a friend to a party; the second week, a short narrative composition, *An Accident on a Busy Street*; the third, an answer to an advertisement; the fourth, an expository essay, *How to Make a Tapioca Pudding*; the fifth, an imaginary conversation between two characters from a story in the literary reader. The class had no part either in the selection of the topics or in determining their sequence. Pupils obey the directions and do as well as they can—the more gifted among them, buoyed up by a vague hope that all this is good for them. What if we had to live a life that was entirely laid out for us and made up of arbitrary and utterly unrelated tasks? Yet this is what we ask our children to endure uncomplainingly and even cheerfully. How can a regimen of such experiences give any adequate preparation for life?

To replace this all too common form of composition, a sixth-year class of boys was asked to consider making a book devoted to the subject of dogs. The idea took hold at once and the discussion turned to the contents of the proposed book. The children suggested the inclusion of the following: a favorite dog story; incidents showing the service dogs render to mankind; how to care for the dog; treatment

of common dog ailments; collection of good dog pictures, or, if possible, photographs of dogs; lists of books containing dog stories. These topics were arranged in intelligent sequence and gave the class a series of related composition exercises for six or eight weeks. Letters were written to leading kennels and drug houses asking for their free booklets on the care and treatment of dogs. Committees were appointed to consult with the public library in order to secure lists of books containing dog stories and to make reservations for these. Many of the reading lessons were given to *Buck*, *Stickeen*, and *The Bar Sinister*. When the material was finally collected and the compositions were all written, the question of suitable titles arose. Suggestions were listed on the blackboard and the relative merits of different titles were debated. In the end, each pupil chose the title that he liked best. Then came the planning of the title page; this was made the subject of study in the drawing class. Appropriate designs had to be evolved and the selected title attractively lettered. And finally, the study and preparation of the binding and cover design brought the project to a close. The ordinary class is taught to do lettering by the drawing teacher; like making a design, lettering is just another exercise that springs from the course of study. But in this project, composition, oral and written, reading, lettering and design, and manual art were combined into one big experience. At the end of the very first lesson, the children saw the composition work that lay ahead of them. The whole situation appeared unified and purposeful, the whole big task was undertaken jointly by class and teacher; it was not imposed upon the class by the teacher. The course of study calls for the teaching of exposition, description, narration, and letter writing. But does not this composition project meet these requirements fully?

A geography project. In learning the geography of the United States, one class studied, among other topics, these three in sequence: cities, distribution of population, important means of travel and transportation. It is apparent that these topics form part of a logical plan, conceived by the teacher, and expounded, bit by bit, in successive lessons. Again, the

class played no part in devising the plan; in each lesson the teacher set the specific objective for the day.

In a second class, this information was gathered as part of a commercial project. The teacher explained the duties and responsibilities of a sales manager and then asked the pupils how they would apportion territory among a staff of fifteen salesmen who were to cover the United States under their direction. The suggestion to divide the number of states by the number of salesmen was soon found absurd. Under the teacher's guidance, the class saw that it would have to formulate a plan of study before the question could be answered. The following was evolved:

1. Study the distribution of population
2. Locate the important cities
3. Locate the cities on their respective lines of transportation
4. Route the salesmen accordingly.

Here was work in geography that was expected to consume many periods, but each pupil knew, at the end of the first lesson, what was to be accomplished in the next four or five weeks. We are not insisting that the children were necessarily happy in the prospect. The significant observation is that they had a responsible part in planning the learning of a set of socially necessary facts. If they dislike geographic information of this type, then their quarrel is not with the school, but with life that makes the learning of such knowledge necessary.

In carrying out this project, a variety of related experiences was introduced. Maps were made on which the changing places of the sales force were spotted. Railroad and steamship time tables and tariff schedules were used for reference. Correspondence was maintained with the active sales staff and many types of business letters were planned and written. Checks were sent to the salesmen to pay their traveling expenses and commission. Bills received from them were checked up and orders were acknowledged to them and to the customers. Much of the grade work of composition and arithmetic was interrelated with the geography and the children

were made to feel that unity in their school work that is present in life.

A project in literature. Pupils are accustomed to reading selections from readers. When a story or a poem is completed, no one knows what is to be read next. All wait for the announcement by the teacher, who keeps her plans of sequence and selection of reading material strictly to herself. In fact, she herself may have no definite plan in mind. An eighth grade, responsible for one day's program in the school assembly, decided to give a play. The teacher suggested that since it was their play, the pupils should make their own selection. There was general agreement. "But what shall we select?" they asked. "We don't know suitable plays." It was decided to ask each pupil to submit, after visiting the library, the names of at least two collections of one-act plays to a committee of five, including the teacher. That done, the committee selected five one-act plays from which a final choice was to be made by the class.

The children foresaw no further difficulty until the teacher suggested that if the five plays were read to them, one of two situations might arise, either too many would vote for the last play or there would be a hopeless division of opinion. "How shall we judge?" was the question asked. The teacher suggested that a set of requirements—a standard—be prepared in terms of which the final selection should be made.

In the discussion which took two periods, the following requisites of a good playlet were formulated with relative values for the several items:

The plot or story must be interesting.....	40 points
The play must contain something unexpected.....	15 points
The play must teach something worth while.....	10 points
The characters must be well portrayed.....	20 points
The play must be suitable for presentation by amateurs who have only simple scenery.....	15 points

This contribution to literary criticism should not be taken too seriously; it was formulated by the class under the guidance of a teacher who believed that the final outcome should be the pupils', not hers.

Each play was read aloud by a committee which apportioned the task among its members. At the completion of the reading of a play, it was analyzed and evaluated. Every child knew what was to be read not only in the day's lessons, but also in the lessons of the coming fortnight. Oral composition, extensive home reading and interesting oral reading in class were combined into one purposeful experience.

Project Curricula for the Earlier Grades.—The introductory grades are replete with opportunity for project teaching. The reader is referred to earlier chapters on curriculum planning for a full discussion and ample illustration of project curricula for the primary grades.¹

Types of Projects.—Projects, like problems, may take many forms; the most common of these, with suitable illustrations are suggested below: ²

1. The manual type of project

Making the costumes and scenery for a play to be presented by a class.

2. The intellectual type of project

The composition and the geography projects described in a preceding section of this chapter.

3. The social or community type of project

Planning a campaign to rid a community of the mosquito pest. The project includes the following activities: enlisting community help through posters and slogans; the making of posters and the lettering of the slogans; studying the life and habits of the mosquito, modes of extermination, and communication of disease by insect carriers; writing to departments of local governments for coöperation; reading reports of similar undertakings elsewhere. The subjects of composition, drawing and design, hygiene and civics, are here combined into one purposeful activity. Similar projects are planning a better English week and planning a campaign for cleaner parks or cleaner streets.

4. Æsthetic and dramatic types of project

Undertaking to decorate the classroom. Some of the related

¹ See pages 141-143.

² The classification has no intrinsic value. It is offered merely as a means of giving a comprehensive view of the variety of forms of projects.

problems include: decision on what is appropriate; study of reproductions of masterpieces to select most suitable pictures and casts; study of color combinations preparatory to painting the class bulletin boards and window boxes; writing to friends of the school for contributions; giving a play as a means of raising funds. Here, too, the class work in picture study, composition, arithmetic, and literature can be coördinated into one purposeful undertaking. Similar activities are studying costumes of a period in order to make correct costumes for a play; reading and evaluating ten selected war poems to decide whether England or America produced the more effective war poetry; critical reading of a series of one-act plays to select the most suitable for presentation to the school; planning a pageant to sum up the semester's work in history, the settlement of America.

5. The excursion type of project

A trip to the museum to obtain help in understanding the Renaissance, the period studied in history. Similar projects are visits to industrial and commercial establishments, colonial homes, museums, art galleries, and specialized exhibitions.

6. The project to develop skill

Preparing pupils for an athletic contest by having each participant practice to perfect his particular performance, such as goal shooting, basketball passing, or goal guarding. The development of such skills as adding or spelling correctly may be a project to the teacher but not to the children. The project idea is dissipated when applied to such formalized learning.

The Meaning of Project.—The analysis of all these teaching situations leads us to conclude that a project is a complete unit of purposeful experience. It is an episode, taken from life, presented with all its human background and, therefore, possessing educative significance.

The problem and the project differentiated. A project is always a real situation but a problem may be supposititious. What changes in the life of Italy would follow the removal of the Alps, or what changes in industries and commerce of the leading nations would take place if, by magic, we erected a series of high mountain chains along the northern and western

coasts of Africa are hypothetical problems, and yet, very helpful in the classroom.

A problem usually affords the class a task for a particular period while a project is generally an extended enterprise calling for a diversity of activities. A project may, therefore, necessitate the solution of many problems. As a rule, a problem is limited to the subject matter of one of the common school studies, whereas a project cannot be carried out within such confining bonds. The solution of a problem may, therefore, involve little correlation while the successful prosecution of a project erases, in large measure, the lines of demarcation of the departmentalized school subjects.

Organization of a Project.—In the development of a project, the class must take an active part in formulating the entire plan. In this complete identification of the pupils with the undertaking lies the most significant value of the project. We recognize, therefore, the following steps in the progress of the project:

1. The situation is presented to the class by the teacher or by a pupil.
2. An agreement is reached to undertake the project and carry it to successful completion.
3. The project is analyzed into its constituent activities which are arranged in the order in which they should be undertaken.
4. The activities are taken up one by one.
5. In the light of experience, the original intention may be changed and the initial plan modified.
6. As the project nears completion, teacher and class assume a critical attitude towards it; they try to gauge the degree to which they have succeeded; they list their errors and indicate, if possible, an improved procedure for attaining the goal. In this taking of stock, the lessons of experience are summarized.

Reputed Values of Problem and Project Teaching.—

1. These recitation patterns insure highly motivated class work and demand curriculum material that is socially significant. The closer a genuine project is approximated, the more accurately do we lay the ax to outworn subject matter that clings to school curricula with the grip of ages. In problem

and project teaching, knowledge is acquired because it must be put to use; in the more formal recitation patterns, studied in the preceding chapters, knowledge and skill seem to be sought mainly for their own sake.

2. Pupils are active and mentally aggressive in project and problem teaching. They play their part in the selection of the tasks, in planning the solutions, and in evaluating their success.

3. Ample objectives for determining progress are assured. The extent to which a purpose has been attained is a reasonably safe measure of the intelligence and the skill that were called into play.

4. As a rule, a textbook is studied consecutively, by pages or by paragraphs. In problem or project teaching, the book is used more rationally for reference, rather than for slavish memorization. As facts are needed, they are sought in the printed pages. The clearly defined objective gives the pupil a basis for weighing the value of the facts presented by the book.

5. No other recitation mode contributes as much towards effective organization and natural correlation as a project. In every one of our illustrations, kindred topics of different subjects were focused into a line of thought logically evolved and always moving towards a definite objective. Rational organization is always important in teaching but effective correlation is especially significant to-day. The old curriculum contained very few subjects but it allowed almost as much time to elementary and secondary-school education as we do to-day. As a result, the stream of knowledge was relatively narrow but deep. To prepare for a life of greater complexity, the curriculum admitted first one subject and then another, until we have at present, a stream of knowledge that is wide but comparatively shallow. The remedy lies not in the elimination of subjects because each was introduced, presumably, to meet a new demand of life, but rather in a close correlation among the related topics of different subjects. This interrelation of subject matter leads to two very desirable results: (a) the field of knowledge is unified and is thus

reduced in scope; (b) the natural correlation gives added viewpoints and new interpretations and thus leads to greater thoroughness of comprehension.

6. The gifted child finds in problem teaching a tax on all his ability, and in projects a variety of activities that open up limitless vistas. The character of the reading and the intensity of the creative thinking required to carry a project to a successful conclusion, call for an investment of all of the ability of the superior children.

7. For all children, the problem and the project give training in thinking about life's real situations. These recitation patterns teach the futility of aimlessness. They stress the importance of attempting to attain a clearly formulated goal by a well laid plan that must be repeatedly subjected to critical evaluation.

Limitations of Problem and Project Recitations.—In project teaching we have all the advantages of purposeful activity but no magic cure for all our pedagogical ills. Applied to formal experiences that must be habituated through repetitions, the project fails. Teaching to spell common words or the location of the most important places on the earth's surface may be termed a project in the dictionary sense, but is always a cold drill lesson for the pupils. Such sectional textbook headings as, "A Project in Fractions—How to Add Them" are misleading. These specific bits of information should be motivated and accepted for what they are—merely necessary arithmetical processes. No real learning can continue for an appreciable time without formal drills—purposeful, attentive repetitions in natural associations, but, in the last analysis, drill for all that.

A limitation of the project is seen when the undertaking is extensive and includes a large variety of activities. The cities of the United States are located, but the project of which this specific task is but a part is lost in the tedium of the immediate task. Frequently, learning that was initiated many days ago by a real project, proceeds on a formal basis not unlike traditional practices.

What is a real project to the adult may nevertheless still

be an arbitrary and hence unwelcome task to the child. Managing fifteen salesmen, charting their territory and keeping up real correspondence with them seem useful enough to us, but many a child bent on pleasure or with a decided penchant for things manual, finds this adult experience a distinct intrusion. Shall we leave the selection of the learning situation to the children or to the teacher? What assurance have we that the children will avoid the trivial and that the teachers will not be guided more by the needs of to-morrow than by the interests of youth? A single illustration ran through a two-hour lecture on project teaching by one who has done much to popularize it. The lecturer told of an imaginary Willie who was trying to make a kite that would fly. The lad used paper that was too heavy and could not get his kite to rise. Newspaper, he found, was too weak to withstand the wind. Umbrella ribs and sticks of one kind of wood made his kite too heavy; another type of wood lacked flexibility and invariably broke. His problems led Willie into a study of paper and the characteristics of different kinds of wood. These matters cleared up, Willie applied himself to mastering the laws of physics and mechanics involved in kite flying. Each succeeding research was an added joy to this lad. Are we not repeating here the old fallacy of reading the motives of a mature mind into the child and forgetting to learn child psychology from a study of the child? What real boy undertakes an extended inquiry on kite flying while the summer slips by?

Among the many unwarranted criticisms directed against project teaching, we hear the following: it is excessively manual; it undermines effective organization of subject matter; it supplants courses of study by situations that happen to satisfy the passing interests of the child. Nothing in our analysis justifies the first objection. Manual projects form one of the many types of projects worthy of study. Project teaching may banish the logical organization found ready-made in books and in lessons planned by the teachers alone, but it also set up a psychological organization of objectives and procedures. This new organization means more to the

child because it is the joint product of the coöperative effort of teacher and class. Finally, every project we suggested can be carried out as part of existing curricula.

Final Evaluation of Project Teaching.—Aside from the limitations we have just recognized, project teaching promises much that is pedagogically vital. In the last analysis, it is more than a mere method of teaching, it is an attitude towards life and a mode of living. Genuine project teaching will come slowly and gradually and will bring with it a curriculum made up, not of separate school subjects, but rather of the inevitable and persistent problems that confront each individual in his major adjustments.

The Socialized Recitation.—*Socialized Teaching Explained.*—In most formal instruction, the teacher is regarded as the sole and final authority. As the recitation proceeds, the successive answers are accepted or rejected by him. There are few other situations in which a group is intellectually dominated so completely, so persistently, and so successfully. In normal relations, intelligent people agree and disagree; they try to understand one another's point of view; they accept as well as offer corrections—in a word, they talk together and think together. The socialized recitation attempts to make learning a coöperative enterprise in which the group thinks together in order to reach a conclusion acceptable to all its members.

Illustrations of Socialized Recitations.—Compositions were being read aloud by their authors for class criticism. The first pupil, who always rushed in where more cautious classmates feared to tread, insisted that in the sentence, "One of the boys was elected leader," the word *was* should be *were*. "Wrong, sit!" came peremptorily from the teacher. In socialized teaching, the teacher insists that the criticism be addressed to the pupil who wrote the sentence and that he either accept the correction or reject it with adequate support of his own position. A letter applying for a position was read to the class; it began with, "I hereby apply for the position of . . ." The following conversation illustrates the spirit of socialized teaching:

HENRY: I don't like your opening sentence. It is too sudden.

JOHN: How would you begin this letter?

HENRY: While reading this morning's paper, I chanced to see your advertisement, or, From a friend I just learned that there is a vacancy in your office.

JOHN: My opening sentence comes to the point. I think busy men don't care where we find out that there is a vacancy. Besides everybody begins the way you suggest.

The debate ended as each disputant turned to the teacher. The class was asked for a show of hands and presented the same division of opinion. The teacher then explained why John's introductory sentence is superior to the traditional opening suggested by the critic. Teacher guidance took the place of teacher domination and the children were encouraged to think together about a common concern.

Characteristics of Socialized Teaching.—By definition the socialized recitation identifies, not a distinct recitation pattern, but rather a coöperative and sympathetic spirit that turns class teaching into group learning. It is an attitude that makes for self-expression, for questioning by pupils rather than by the teacher alone, and for a relationship in which the teacher, as the benevolent guide, encourages mental aggressiveness both in criticism and defense.

Limitations of Socialized Teaching.—In subject matter rich in content that calls for personal judgment rather than definite fact, socialized recitations exhibit their educational worth. But how can drill lessons be socialized? In these situations, habits not opinions, performances not discussions, are the desiderata.

The values of socialized teaching are often dissipated in aimless wanderings. A trivial suggestion here, an irrelevant observation there, and the class discussion continues, totally oblivious of the objective that initiated it. Skillful teachers can minimize this besetting danger of socialized teaching by writing the aim of the lesson on the blackboard and by frequent reviews at logical pauses in the development of the thought. At each irrelevancy, the aim is recalled; at reasonable stopping places the pupils are required to summarize the

results of the lesson in the hope that the retrospect will sharpen the view of the end to be attained.

In the discursiveness which often characterizes socialized lessons, many observations are made but fundamental principles may not be stressed enough. In a socialized recitation on Czechoslovakia, the class spoke of the art, the glassware, and the life of the people but not a single pupil could locate the new republic on an outline map. A subsequent test showed that most children learned little from the discussion and knew only those phases that they prepared for report. It is a grievous error to assume that all of a lesson must be socialized. Again and again, the teacher must assume active direction and insist on formal learning of basic facts. This alternation of socialized discussion with formal learning under teacher direction usually makes for significant economy of time and effort and successfully avoids the superficiality so frequently observed in socialized recitations.

Much that passes for socialized recitations is mere gesture, a perfunctory procedure in which the place of the professionally trained teacher is taken by an immature child. A group of superior children were conducting a socialized recitation on "Washington's Administration." The pupil-chairman called on many classmates, asked many questions, recognized those who were moved to make suggestions, and answered questions with marked ability. But at the end of the period, the children knew little more than they did at the beginning. Their inexperienced chairman led them to form no new viewpoints nor to clinch added interpretations. More than the relegation of the teacher to a seat in the rear of the room is required for a genuinely socialized recitation. Any recitation, even the formal method-whole, may be socialized by introducing, not new teaching steps, but a spirit of intellectual coöperation.

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QUESTIONS FOR DISCUSSION

1. Differentiate a recitation from an act of incidental learning. What is the basic principle of a recitation? Illustrate it.

2. Plan an inductive lesson on the development of cities at the mouth of large rivers. Plan a deductive lesson on the same topic. Which lesson do you prefer? Why? Which requires greater pupil participation? How would you test the comparative worth of each of these recitations?

3. "Details should always be selected with reference to the generalization that they must build up." Explain by illustrating from actual lessons.

4. List the weaknesses and the strong points of both inductive and deductive methods. Which are the most significant?

5. Plan a drill lesson in locational geography showing the sequence of steps in the lesson. By referring to the lesson, illustrate: "The object of the drill lesson is to insure the functioning of experience as habit. . . . The laws of the drill lesson are therefore the laws of habit formation."

6. List different modes of planning review lessons. Give an illustration of each. What characteristics of reviews do your lessons reveal?

7. Prove that every effective review lesson makes for thoroughness of understanding as well as for longer retention.

8. Devise a series of simple tests that will enable you to determine whether observation has been trained by a laboratory course in one of the physical sciences. Why will tests formulated along the lines you suggest achieve the purpose intended?

9. Cite instances from your own experiences to illustrate the following:

- (a) Concepts that are empty because they lack perceptual experience
- (b) Imagination is conditioned by perceptual experience
- (c) The child's imagination is active
- (d) The child's imagination is not concerned with the creation of the probable
- (e) Overemphasis on facts and the neglect of human background in history
- (f) Stressing form and neglecting the appreciative interpretation of the arts

10. What is meant by "history and literature train imagination"? In what specific respects is imagination trained by these two subjects? Illustrate.

11. Plan a lesson for appreciation, giving (a) the specific object; (b) the preparatory conditions to insure successful reactions; (c) the cautions and special devices used to quicken appreciation.

12. With respect to dramatization, give (a) its psychological sanction as a classroom device; (b) the objectives to be attained; (c) illustrations of proper dramatization; (d) illustrations from your experience of situations in which dramatization is inadvisable; (e) a standard for determining the appropriateness of a specific dramatization.

13. "Study is a personal procedure which each person discovers for himself empirically." Discuss the statement; be sure to state your position with adequate support.

14. Analyze an act of study of your own. What practices do you regard as especially helpful? Which should be modified or eliminated? Why?

15. Explain the meaning of assimilative reading. Give six exercises designed to develop power in this type of reading. Should reading by "skimming" be encouraged? Under what circumstances?

16. What type of study should be used in each of the following study lessons: (a) rules of spelling; (b) the terms of an important treaty that concluded a war; (c) the meaning of brokerage and how to compute it; (d) learning a poem by heart; (e) why England is a commercial nation; (f) the lever and its law.

17. Evaluate the common practices in supervised study. How do they compare with the procedure suggested in this text?

18. "Less class teaching and more class studying will make schooling more valuable." To what extent is this statement based on objective evidence? Outline a plan for securing real data to prove the values so often claimed for supervised study.

19. For each of the types of problems listed in this chapter, give an illustration of your own taken from class teaching. What types of problem or thinking are not included in the listing?

20. Recall a challenging situation that arose in your own life. Analyze the process by which the mind finally came to a solution or a decision.

21. Plan a problem recitation on one of the following lessons:

- (a) Multiplying the denominator decreases the value of a fraction
- (b) To divide by a fraction, invert the divisor and multiply
- (c) The United States, an active participant in the World War and in the formulation of the Treaty of Versailles, is not a member of the League of Nations created by the treaty
- (d) Much wire must be used in wireless communication
- (e) Perspective of curves

22. Plan a project on one of the following situations, listing the activities to be undertaken:

- (a) Literature: Did England or America write the better war poetry (World War)?
- (b) Civics: A campaign for cleaner and better kept parks
- (c) Hygiene: Bringing each classmate close to normal weight
- (d) Arithmetic: Organizing a company

23. Evaluate the advantages claimed for project teaching. Are

these proved advantages or merely statements of logical expectations? Give reasons.

24. To what extent are the principles advocated by the following in harmony with project teaching: Rousseau, Milton, Locke, Pestalozzi, Froebel, Herbart, Spencer, James, and Dewey?

25. Why do some teachers think that they have always taught by projects?

26. Which of the following statements are true? Give reasons:

- (a) Project teaching is impossible with existing curricula
- (b) Project teaching means socialized teaching
- (c) In project teaching, both the preparation for the lesson by the teacher and the burden of actual teaching are materially reduced
- (d) A project lesson lacks real organization of its subject matter
- (e) Project teaching affords excellent training in organization of data
- (f) Without specialized equipment, project teaching is impossible
- (g) Project teaching is as old as purposeful teaching
- (h) Project teaching helps to meet the problems produced by individual differences

27. Which of the following statements are correct? Why?

- (a) The principle of the socialized recitation can be introduced into any recitation pattern
- (b) It is simpler to socialize an inductive recitation than a problem or project recitation
- (c) The teacher must never be in active charge of the class in socialized recitations
- (d) The chief aim of the socialized recitation is to teach children to express themselves
- (e) The socialized recitation favors the superior rather than the mediocre child
- (f) The teacher must do much to encourage some children to participate in a socialized recitation because many children prefer to remain auditors

28. List the dangers or weaknesses of socialized recitations, which are inherent in this plan of teaching. Which can be partly overcome? How?

29. We read about "new methods" of teaching which are contrasted with "old methods." Which of these recitation patterns belong to the "new"? Which to the "old"? What is your principle of classification, the age or the psychological basis of a method? Defend your classification.

30. What characteristics do you demand of a perfect teaching method or recitation pattern? Which one of the recitations studied comes closest to your ideal teaching procedure? Why?

CHAPTER XXVII

THE TRANSFER OF TRAINING

The Problem.—School studies are commonly justified in terms of disciplinary as well as utilitarian values. Disciplinary values refer to the permanent effects upon mind; to the development of that mental fiber that insures ability to make the necessary adjustments to life adequately and independently. The vital problem, however, is to determine the extent to which training in one set of experiences will develop power that can be used in situations that are wholly different and in others that have elements similar to those in the original situations. Acquiring proficiency in mathematics or accountancy is undoubtedly accompanied by increasing accuracy. But accuracy in what? In bookkeeping alone? In all studies? In all social relations? Is the full measure of precision developed in the laboratory transferred to all other situations requiring exactness in measurement? The final answers to these questions will determine, to a marked degree, the content and the method of future education.

The Doctrine of Formal Discipline.—*The Theory Stated.*—The old theory of formal discipline offers a simple solution; it teaches that power developed in one experience can be utilized in any other experience. These disciplinists conceived the mind as a reservoir in which power, developed, but not immediately used, is stored. Through mathematics, reasoning power is increased; through history, imagination is developed; in the laboratory, observation is improved. These surpluses of mental power flow into the reservoir of the mind and are drained off when an occasion arises in which one must reason or imagine or observe.

Origin of the Theory of Formal Discipline.—The doctrine of formal discipline has its origin in the old faculty psychology

which regarded the mind as made up of discrete powers or faculties—one for reasoning, one for observation, one for volitional control—one for each function of the mind. Train one of them, the argument ran, and you have strengthened that faculty to serve you at all times. In studying Latin and Greek, the student learned to recognize verbal relationships and to distinguish a condition less vivid from one more vivid. His faculties of abstraction and discrimination were presumably so developed that he was prepared to perform more efficiently all acts of abstraction and discrimination.

• *Modern Functional Conception of Mind.*—Contemporary psychology holds that an organism reacts as an integrated whole to each experience. Imagination and reason refer, therefore, not to special powers, but to modes of mental reaction to specific situations. Since experiences differ in content and in intensity, the reactions suitable in any one instance are not necessarily helpful or even appropriate in another. We must imagine in history and in geometry. We must think in grammar and in biology. But the word imagine used in relation to geometry refers to an activity that is very different from that which takes place when we imagine in history. So, too, the expression, thinking in grammar, identifies a mental activity very different from thinking in biology. The full measure of difference will be understood when the reader, after introspection, compares his mental processes in thinking out a solution to an arithmetical problem, with those involved in coming to a decision in a political matter.

Prevalence of the Doctrine of Formal Discipline in Educational Practice.—Woodrow Wilson in answering his own question, "Why go to college?" said, "The mind takes fiber, facility, strength, adaptability, certainty of touch from handling mathematics, Latin, Greek, etc. The college should give elasticity of faculty and breadth of vision so that they (the students) should have a surplus of mind to expend." School men are prone to make up a high-school course of study in terms of mental functions—literature for emotional training, mathematics for the development of reasoning, and the like. The science faculties, so bitterly opposed by the classi-

cists fifty years ago because of the crass utilitarianism of science, are to-day militant in their opposition to the social sciences; these new studies, they argue, necessary though they be in our highly socialized life, nevertheless give less rigorous and, therefore, inferior mental training. Much is retained in our courses of study mainly for its reputed disciplinary effects.

Critical Examination of the Doctrine.—*In the Light of Experience.*—Teaching often proceeds on this theory that skill developed in one situation can be applied to all others. Spelling is taught in isolated lists; the very words that are written correctly in the spelling test are spelled incorrectly by the child in his composition. Children may know all the forty-five additive combinations, like $9 + 6$ and $7 + 8$. But they fail in $6 + 9$ and in $8 + 7$, and rarely know $90 + 60$ or $19 + 6$ without special progressive drills. Adults who know the laws of elementary physics and mechanics often fail to apply them in simple chores about the house. A class that had just completed the study of centrifugal and centripetal forces was asked to solve a simple puzzle that requires the application of the very knowledge just acquired. The toy or puzzle consists of a circular disk covered with glass. Near the circumference, 120 degrees apart, are three hemispherical depressions. Between the disk and the glass are three little balls that roll about freely. The object of the puzzle is to fill all the three depressions with the little balls. It is relatively simple to fill two of them but in tilting the toy for the third ball to fall into its place, one of the others is invariably dislodged. All tried the method of tilting and all failed. No one, not even the teacher, thought of spinning the disk rapidly and relying on centrifugal force to bring the three little balls to the area near the circumference so that they might fall into their intended places. Unless pupils are taught to make the applications of theoretical knowledge to practical situations, there is likely to be a fearful gap between theory and practice. We have too long proceeded in blind faith that knowledge and skill, once acquired, spread spontaneously to all situations where they may be needed.

Moral and æsthetic standards differ with circumstances.

The courageous Miles Standish, fearless in battle, was not brave enough to face Priscilla. A sense of beauty may be limited to color or to sound. Many a painter exhibits unsophisticated taste in music and as many musicians prefer chromos to real pictures. People who are neat in matters of dress may send slovenly letters, others whose desk and written work reveal a keen sense of order are extremely careless about personal appearance. The mechanic with an uncanny sense of accuracy with materials does violence to truth in reporting his success as a fisherman. Physicians and laboratory assistants whose technique is noted for its scientific precision are often gullible in matters of politics or business investments. We may exhibit remarkably keen perception in the darkest nooks of one set of experiences and yet be as blind as owls in the sunlight of others.

In the Light of Experimental Evidence.—The transfer of training has been a favorite field of investigation among psychologists from James to those of our day. The experimental technique employed in earlier studies was usually very simple; for example, a test was given of the skill in discriminating tones and the results were carefully recorded. Practice was then given in a wholly different type of discrimination, like discriminating different sizes and shapes, until a marked improvement was noted. A retest then took place in the initial skill. If the second test showed marked improvement, or retrogression, then the change was ascribed, in large measure, to the training in discriminating sizes and shapes. This technique is open to criticism. Many of the exercises are extremely formal and unrelated to life; memorizing nonsense syllables or the vocabulary of an artificial language are typical of these. Then there are people who learn much from one contact; hence the second test, the retest, may reveal a higher degree of efficiency than would normally be attained in an entirely new test. Also the attitude of the subject changes the character of the result; he may become sufficiently interested in the project and in his own progress to introduce a factor usually not present in ordinary learning.

Recent investigators have improved research technique to

a point that reduces the force of some of these criticisms. Control groups are now used to determine the significance of irrelevant or disturbing factors. Present-day testing procedure and testing instruments give more accurate measures of changes in skill and permit the student to make more helpful interpretations. Without a control group, improvement in any function cannot be ascribed definitely to a particular type of training. Let us assume that light is sought on whether memorizing poetry quickens the learning of locational geography. In the initial test it is ascertained that the practiced group can learn the names and locations of twenty cities in fifteen minutes. A control group, taking the same test, achieves the same results; it, too, learns the location of twenty cities in fifteen minutes. The first group, the practice group, then spends a period a day for ten days, learning lines of poetry. The control group is not required to learn poetry during these ten days. On the eleventh day, both groups are retested for ability to learn locational geography. Let us assume that the practiced group can learn the location of twenty-five cities in fifteen minutes, while the control group can learn only twenty-three locations. Both groups have improved; both have enjoyed such benefits as come from the experience of taking the initial tests; both groups may have become interested in the experiment and may exert greater effort; both are richer by ten days of living and by ten days of growth; hence, if the groups are large and the same results are obtained with many different groups, it seems reasonable to conclude that learning lines of poetry for ten days produced an increase of two items per fifteen minutes. The gain of the practiced group is $\frac{5}{20}$ or 25 per cent; of the control group, $\frac{3}{20}$ or 15 per cent; hence practice in learning poetry for ten days has improved capacity for learning location of cities by $(25\% - 15\%)$ 10 per cent. These facts are supposititious and are here presented, with all their crudeness, to illustrate, not scientific technique, but rather the significance of control groups.

The object of all experiments in transfer has been to discover the intensity and the extensity of transfer, that is, the

degree to which improvement in a trained function will pass over to an unpracticed function and the number of unpracticed functions that become improved as a result of training in a given function. While their goals have been similar, the results of these investigations show marked disparity:

Ebert and Meumann,¹ in 1904, concluded as a result of their experiments, that there is positive transference of skill, due, they thought, to increased attention and the acquisition of better methods of learning. Meumann writes, "All sorts of memory were considerably improved by the mere drill in the learning of nonsense syllables. . . . We may make, on behalf of the schools, a renewed demand for memory exercises, which shall aim to improve memory itself, and which shall, in that sense, constitute a formal training in memory." Later experiments failed, however, to confirm these conclusions.² In 1909, Dearborn,³ using control groups and superior technique, obtained data that showed the possibility of transfer but decidedly less quantitatively than Meumann's experiments. Coover and Angell⁴ found that the "effects of practice may be transferred from a trained to a non-trained function," that is, discrimination of brightness of light and color may be improved by training in discriminating pitches. They agree with their colleagues that this transfer is facilitated by the coöperation of learning factors—improved attention and a new interest in one's power to detect small differences.

The experiments of Thorndike and Woodworth⁵ in 1901 measured ability to discriminate areas and lengths and to detect words with certain letters. After considerable practice was given in discriminating areas and lengths within certain limits of size, the subjects were tested for ability to discriminate other areas and lengths within larger limits of size. The authors found that there is some transfer but, on the whole, very little, and that there was evidence in many instances of zero and even negative transfer.

¹ E. Meumann, *The Psychology of Learning* (D. Appleton & Co., 1913), pp. 353-357.

² H. B. Reed, *Psychological Review*, Vol. 25 (1918), p. 331.

³ W. F. Dearborn, "Experiments in Learning," *Journal of Educational Psychology*, June, 1910.

⁴ Coover and Angell, "General Practice Effect of Special Exercise," *American Journal of Psychology*, Vol. 18 (1907), pp. 328-340.

⁵ Thorndike and Woodworth, "The Influence of Improvement in One Mental Function upon Efficiency of Other Functions," *Psychological Review*, 1901, pp. 247-261; 384-395; 553-564.

Fracker,⁶ in 1908, found that transfer took place between experiences as dissimilar as memory of the order of tones and the learning of poetry but that the greatest transfer was between similar experiences. This transfer, he concludes, is due to increased power of imagery and to "conscious effort to use the elements of training in a different task."

Winch's data⁷ show that memory for geography was improved through the memorization of poetry; that practice in verbal memory improved the memory for content material. He believes, "Training that is acquired through the memorizing of one sort of subject matter may be transferred to the memorizing of all sorts of subject matter whose nature is certainly diverse from the first."

One of the most interesting experiments recorded was conducted by Scholekov and Judd in 1908. Two groups of children were used; the one was taught the principles of refraction, while the other received no such instruction. Both were given practice in shooting at a target twelve inches below water. After the first series of practice exercises, no difference was noted between the two groups. It seems that knowledge had no effect upon the result and that both groups were concerned with learning the idiosyncrasies of the dart. A new condition was now introduced—the depth of the water was decreased from twelve inches to four inches. After each series of practice exercises, it was apparent that the performance of the group that had knowledge of refraction was decidedly superior, while the other group was almost at sea. Judd⁸ concludes that the ability to generalize, to apply a principle, determines transference.

Thorndike's study⁹ of 1924 on the comparative disciplinary values of high-school subjects is significant. The 1927 inquiry on the same question confirms, in the major aspects, the finding of the former investigations.¹⁰ Much that is prescribed in high-school curricula is determined by the college whose academic prescriptions, in turn, are decided largely by reputed training values of the several subjects.

⁶ G. C. Fracker, "On the Transference of Training in Memory," *Psychological Review*, No. 38, pp. 56-102.

⁷ W. H. Winch, "The Transfer of Improvement in Memory in School Children," *British Journal of Psychology*, Vol. 2 (1908), pp. 284-293.

⁸ C. H. Judd, "Relation of Special Training to General Intelligence," *Educational Review*, Vol. 36 (1908), pp. 28-42.

⁹ E. L. Thorndike, "Mental Discipline in High School Studies," *Journal of Educational Psychology*, Vol. 15 (1924), pp. 1-22 and 83-89.

¹⁰ Broyler, Thorndike, and Woodyard, "A Second Study of Mental Discipline in High School Studies," *Journal of Educational Psychology*, Vol. 18 (1927), pp. 377-404.

Thorndike measured the disciplinary value of a subject by the improvement it induced in general reasoning ability.

Mental tests were given to 8,564 students of grades X, XI, and XII representing eighteen high schools, in May, 1922, and again in May, 1923, to determine the influence traceable to one year's study. We shall not enter into an exposition of the technique employed, of the various control groups used to isolate single factors like sex, of the grouping of subjects, of the mode of making allowance for normal growth in intelligence at the age levels of these pupils, etc. These studies of 1924 and 1927, lead to the conclusion that the amount of general improvement, due to school studies, is small; that the languages hold no preëminent place as agents in general training; that persons of high mental ability made the highest gains; that the average gain in mental ability, in one year, as measured by the tests was 23 points, 11.9 of which were due to the experience in taking the tests, while 11.1 were traced to actual growth in intelligence.

Ranking the subjects according to the disciplinary values in each of these two studies, that is, the 1924 and the 1927 investigations, we have the following interesting table:

Subject	Gain in Points, per Course, According to the Inquiries of		Rank		Rank by Starch, Com- posite of Many Personal Opinions ¹¹
	1924	1927	1924	1927	
Algebra, geometry, trigonometry ...	2.33	2.99	3rd	1st	1st
Civics, economics, psychology, and sociology .....	.27	2.89	6th	2nd	low
Chemistry, physics, and general science	2.64	2.71.	2nd	3rd	very high
Arithmetic, book- keeping	2.92	2.60	1st	4th	low
Physical training..	.66	.83	5th	5th	moderately high
Latin and French.	1.64	.79	4th	6th	very high

¹¹ Daniel Starch, *Educational Psychology* (The Macmillan Co., 1927), p. 258. Based on figures in Table 57.

We must again stress the fact that while the different subjects in the high-school curriculum differ in their power to develop general mental ability, the best of them seems to produce little change, less than three points. Latin does not maintain its reputed place as a school discipline but this may be explained by Thorndike's observation: "When the good thinkers studied Greek and Latin, these studies seemed to make good thinkers. Now that the good thinkers study physics and trigonometry, these seem to make good thinkers." If the most intelligent pupils specialized in stenography or physical training, then these subjects would likewise seem to make good thinkers.

The American Classical League¹² initiated a comprehensive evaluation of methods of teaching Latin and the resulting disciplinary consequences. Significant transfer from Latin to English and to modern languages was found, but this may be traced to similar elements in the content of these studies. The various tests established the facts that the study of Latin (1) accelerates the acquisition of the meaning and of the spelling of English words of Latin origin; (2) shows "significant positive correlation" with progress in French; and (3) makes for only slight gain in reading English understandingly. No conclusive data are produced to prove that mental habits and attitudes, fostered in the teaching of Latin, are transferred to all other school situations.

Experimental data are available to show every possible type and degree of transfer; that training in canceling parts of speech does not improve ability to cancel words containing the letters *e* and *t*; that training in memorizing nonsense syllables does not improve the memory-span for letters, numbers, Latin-English vocabularies, poetry, and prose; that memorizing poetry does not improve ability to memorize dates, poetry of another sort, prose, places on a map, letters, and names; that "memorizing tables improved the ability to locate points in a circle and to learn nonsense syllables, but interfered with ability to learn dates, poetry, and prose."¹³

In *negative transfer*, a specific skill is reduced, not increased,

¹² *The Classical Investigation*, General Report, Part I (Princeton University Press, 1924).

¹³ H. B. Reed, "Associative Aids," *Psychological Review*, Vol. 25 (1918), pp. 128-155; 257-285; 378-401.

by practice in some related function. If training in memorizing dates in history were directly responsible for reduced capacity to learn new number combinations, then the transfer would be decidedly negative. Instances of negative transfer in actual class teaching are not common and most of them can be traced to ineffective modes of teaching. It is a common belief that intense specialization reduces capacity for mental adjustment to new situations outside of the specialized field. This is frequently cited as an illustration of negative transfer. To what extent specialization, the result of definite interests, fosters indifference to experiences beyond its scope rather than reduces capacity to understand and to master them, is still a matter of personal opinion.

How is Transfer Achieved?—*The Restatement of the Law of Transference.*—Although many of the most significant experiments in this field have been cited, no clear-cut conclusion can be drawn from them. The experimental technique must be further refined and conditions, heretofore not under adequate control, must be subjected to closer supervision. At present we have ample data for denying the sweeping implications of both extremes—of the old formal disciplinists as well as of those who insist that no transfer occurs. A very tenable position is that knowledge, skills, and attitudes developed in any one kind of experience are applicable to other experiences in proportion to their similarity. The subject matter acquired and the mental habits developed in the study of Latin are of positive service in learning French but of relatively little aid in learning a physical science. Similarly, the skill developed in the study of economics will contribute much to effective work in sociology or history but very little, if any, to the mastery of a foreign language. Various explanations of the mechanism of transference have been offered by experimental psychologists. Despite their apparent diversity, they reveal, upon close analysis, the same basic principle.

How Does Transfer Probably Take Place?—Meumann, we saw, ascribes transference to improved methods of study—longer span of attention, elimination of causes of waste, and

clearer imagery of the elements of an experience. Spearman traces success in any performance to two factors, the general and the specific. The former has almost universal range and includes elements found in any satisfactory outcome; the latter has a narrow range and includes those elements that distinguish one act from another. Thus, in studying history, attention, recall of related occurrences, attempt to extract meaning from the printed page, and deliberate exclusion of irrelevant matters, constitute the universal factor, while learning dates, names, battles, and facts, constitute the specific factor. Most acts of school learning have about the same general factor in common, but differ markedly in the specific factor. "When specific elements so overlap that the two performances are almost identical, a person's success in one of them must give probability of success in the other also and the two performances must become highly correlated with one another."¹⁴

Gestalt psychology believes that in matters of mind, the whole is something more than the sum total of its parts. We hear a new combination of notes and express approval or disapproval. The whole experience is, therefore, more than the total of sensations, perceptions, and associations. Koffka holds that an organism can acquire ability to perform certain reactions in some situations different from those in which the training was initially given. This is true because a whole situation results only when individual elements of it assume certain positions in relation to the whole. Only as these situations are similar, will transfer take place.

Judd's theory of generalization explains transference on a principle that can readily be applied in class teaching. If science be taught from the book, with emphasis on theory rather than the application of the theory, little will be transferred to other situations. But science that begins with applications, that develops principles by laboratory methods and then stresses further application is likely to be transferred to all situations that require knowledge of science. In effec-

¹⁴Hart and Spearman, "Mental Tests of Dementia," *Journal of Abnormal Psychology*, Vol. 9 (1914-15), pp. 219-221.

tive teaching of science, the pupil is taught the need of accurate observation, of observing essentials, of being guided by purpose, of verifying each inference, of precision in every measurement. When the general applicability of these habits of mind is thoroughly explained and motivated, they tend to express themselves on every appropriate occasion. Judd, therefore, concludes, "Formalism and lack of transfer turn out to be, not characteristics of subjects of instruction, but rather products of the modes of instruction in the subjects."¹⁵

Bagley explains that we carry over, "not a generalized habit of work but a generalized ideal of work," and thus comes rather close to Judd's position.

The theory of identical elements, presented by Thorndike, is most commonly accepted. It is eclectic in nature and really harmonizes apparent conflicts in the other theories. After pointing out that experiences may be alike in (1) *content*, (2) *procedure*, and (3) *ideals or aims*, the theory states that transfer of ability from one experience to others is conditioned upon the degree of similarity among these experiences, or, more strictly, upon the identity of the neural patterns involved.

Power gained in history spreads rapidly to other social sciences because their subject matters are similar. Frequent reference has already been made to this type of identity.

Chemistry differs from physics and both differ markedly from biology. The student who is trained in the laboratory technique in one of these sciences, however, is apt to be better equipped to pursue laboratory work in one of the others. Their content is different but they both demand the formulation of a clear-cut aim and a carefully laid plan for its attainment, the visualization of the procedure before beginning, careful observation in terms of the objective, precision in all measurement, and verification of results; these are basic factors in all laboratory technique. History differs from geography, but the child who was taught how to use his book and maps in one of these studies, will do better work in the other

¹⁵ C. H. Judd, *Psychology of High-School Subjects* (Ginn & Co., 1915), pp. 412-414.

because the two procedures are not unlike. The class that has mastered multiplication by two orders will do better in long division which involves multiplication and requires close attention to correct placing of each figure. Children who know their phonograms well can spell better because the phonogram renders as much service, though different, to be sure, in spelling as in reading. The transfer in these situations of arithmetic and language takes place because of similarity of procedure.

Similarity of aims or ideals quickens the process of transfer provided they are made part of the individual's stock of conscious attitudes. The feeling of self-reliance properly acquired in study recitations is likely to help a child in any situation where independent effort is required. Pupils who have learned the economy of effort inherent in accuracy in arithmetic, will probably not show appreciable improvement in accuracy in unrelated subjects, unless this interpretation of accuracy is applied for them to such situations as reading directions or cutting materials in manual arts. We are merely repeating illustrations of Judd's theory of generalization.

Broadly interpreted, there is little in this theory of identical elements that is in conflict with the other explanations of the probable mechanism of transference, except that of Gestalt psychology.

What Is Carried Over?—This analysis of identical elements in experiences leads to the conclusion that, (1) facts, (2) processes or skills or techniques, and (3) attitudes may be transferred—always an improved function but never an improved faculty.

Summary of Prevailing Beliefs Concerning Transference.

—Despite the conflicting results obtained by means of experimentation and despite the differences in views held by contemporary psychologists, a common meeting ground can now be discerned. Few authorities would take exception to the following statements:

1. Transfer of training is regarded as an established fact.
2. This transfer may be positive, zero, or negative, the last having reference to actual interference with the learning of a new experi-

ence. Thorndike believes that negative transfer is rare and can usually be traced to wrong teaching procedures.

3. The validity of results obtained by most experiments on transfer may be challenged because, (a) the maturity of the students changes; (b) the previous training or specialized experience of each student cannot be ascertained with any degree of accuracy; (c) the exercises used are often not natural learning situations; (d) the training may have been given under conditions not favorable to transfer of power, namely, absence of motivation, failure to generalize an ideal, inadequate comprehension and the like.

4. Though the amount of transfer to a given subject may be small, nevertheless, small amounts of transfer to many similar fields make the total result of transference significant.

Conclusions for Education.—1. *The Curriculum to Be Broad and Liberal.*—Under the old theory of formal discipline, curriculum making was extremely simple and mechanical. In one column were listed the mental capacities or functions to be developed; in the second column, a subject or two was prescribed for each faculty that would best accomplish this development. Each subject was given a psychological or disciplinary index that indicated its educational destiny. Our psychology to-day teaches us that the amount of general improvement due to any school study seems very small indeed. The position accorded any subject in the school curriculum should, therefore, be decided by the value of the special training it affords and by the social significance of its content rather than by its promise to develop general capacity for school work. For generations, the classics were credited with power to develop general intellectual capacities. Again and again, teachers of the classics pointed to the superior general record of those students who excelled in Latin, unmindful of the fact that those who elected the classics gave evidence of linguistic interests and only those with gifted minds could meet the exactions of the subject. No subject produces an intelligent thinker; proficiency in certain subjects may, however, be used as a measure of native intelligence.

The curriculum should incorporate all those experiences that prepare for the variety of thinking found in life. If the

school is a preparation for life, then it must give its pupils practice in living. No subject is especially predestined to give mental training. Improperly taught, no subject has any disciplinary value; properly taught, manual and household arts are as potent in training to do the thinking demanded by life as the traditional favorites, mathematics and linguistics. If the school is to achieve its social mission, it must ever be a part of life, never apart from it.

2. *Methods of Teaching Acquire an Added Significance.*—The greater the transfer of abilities the simpler is the teacher's problem, because knowledge or skill, once developed, would function in all other situations. Because this is, unfortunately, not true in most teaching, we must look to those teaching devices that will insure the transfer of the greatest possible skill and information. Hence we urge, with renewed conviction, the generalization of every element in the technique of productive study, the motivation of the habits we seek to inculcate, the formulation of ideals of work—the practices that distinguish gifted and professionally trained teaching.

In each of the tool subjects, we must develop a hierarchy of skills or habits. We must accustom ourselves to the thought that we train no general mathematical ability but rather specific abilities in mathematics. In the matter of $6 + 7$, we must teach $7 + 6$, $7 + ? = 13$; $? + 6 = 13$, $13 - 7 = ?$, $13 - ? = 7$, $13 - ? = 6$.

It has already been pointed out that children who know abstract relationships, do not necessarily know how to apply them to concrete situations. There is no general reading skill; some do silent reading well but their oral reading is poor; others do oral reading so well that they are enslaved by it and their silent reading becomes slow and uncertain; some can "skim" but are incapable of reflective reading, while others always indulge in slow assimilative reading and can get nothing out of a presentation that was intended to be read at a glance. Hence different types of reading skill must be taught. In geography, map work differs in every essential respect from text study; physical and economic geography are almost different studies. The problem for the educator

is to analyze each of these school subjects into its constituent skills, so that they can be taught one at a time. This is the very essence of skillful gradation, a teaching practice to which we have already made reference but which looms even larger in the light of limited transference.

Much scientific work still remains to be done before the final word is written on the transfer of training to related and dissimilar experiences. We must maintain an open mind, ready to accept any adequately supported conclusion on this pivotal problem which may shape curricula and determine methodology in ways we do not, as yet, suspect.

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QUESTIONS FOR DISCUSSION

1. It has often been said, facetiously perhaps, that it makes little difference what young men and women are taught in college, so long as they are taught that well. To what extent is this true? Untrue? Give your reasons in full.

2. On purely disciplinary grounds, any subject can be justified as a prescribed element in the course of study. Make out a case for a prescribed course in puzzle solving. Wherein does the sophistry of your answer lie? On purely disciplinary grounds, make out a similar case for compulsory military training in all high schools (Think of physical, intellectual, and volitional gains). Are there any differences between the two briefs? Point them out.

3. What is the practical significance of the question of transfer of training? (Think of courses of study, methods of discipline, methods of teaching, prescribed vs. elective programs of studies, and the like.)

4. Why do some investigators regard the experimental data now available on transfer of training as altogether inconclusive?

5. Make a list of the questions concerning transfer of training that you would like to have answered in terms of experimentally obtained data.

6. Plan an experiment designed to reveal the extent to which training in solving algebraic problems will aid students to solve non-mathematical problems in any physical science.

7. A faculty was considering changes in the list of prescribed subjects. Protest was made against reducing the amount of Latin required of candidates for the degree of B.A. The argument ran about as follows: "Those who elected Latin in the Freshman year, stood high in their sophomore mathematics and physics; those for whom Latin was prescribed and who did well in it, also did well in mathematics and physics; hence Latin is well designed to give students the kind of training that insures academic success."

Is the argument sound? Is it wholly or only partly false? Be specific in your criticism and give reasons in full to substantiate your position.

8. Compare (a) Judd's theory of generalization, (b) Spearman's theory and (c) Thorndike's theory of identical elements. Are there any irreconcilable differences among these three theories? What are they? Can these three theories be harmonized? How?

9. Select a subject, for example, algebra or physics, and indicate for it, the practices that a teacher should adopt who hopes to lead his pupils to make the greatest possible transfer of ability and skill to other subjects, especially to those dissimilar in content or subject matter.

10. Plan the type of college course that would probably be advocated by a firm believer in transference or formal discipline. What changes would a believer in limited transference naturally advocate?

CHAPTER XXVIII

DELIBERATIVE BEHAVIOR

PSYCHOLOGY OF VOLITIONAL BEHAVIOR

Tropisms.—Lower forms of life in responding to a specific stimulus move either positively, towards it, or negatively, away from it. The tropism of the moth drives it towards the flame. Plant roots are positively geotropic, they are always attracted towards the earth no matter how the seed is placed in the soil; plant stems are negatively geotropic, always growing away from the earth. Leaves are positively heliotropic, always turning themselves towards the sun. Certain insects are negatively heliotropic, but positively stereotropic.¹ Witness their scurrying as a log is lifted from its damp bed. Chemotropism may explain the action of the spermatozoön in approaching and clinging to the ovum. Loeb regarded all tropisms as generally mechanical and specifically chemical. The light acts on the muscles of the moth's neck in such a way that it must turn its head toward the light and thus make its fatal flight.

Desires.—Present knowledge of biochemistry has revealed comparatively few tropisms in human beings. Our daily life is, however, replete with desires—sensory desires that crave for pleasure, intellectual desires that search for understanding, desires that insure personal safety and race preservation, desires that are concerned with food, shelter, and clothing—an endless array. Some desires are conscious; these are relatively few in number, superficial, and easily understood. Others are unconscious; these are numerous, potent suppressions and

¹ Stereotropism is desire or aversion for the body of an organism to be in close touch with a surface.

are often not understood by the individual whose life they disturb. Desires are cravings to attain a purpose that will satisfy and they exist only when unsatisfied. Since no one can satisfy all his desires, each of us is confronted by the necessity of choosing those desires whose gratification will promote his personal happiness and increase his usefulness to society. We come, therefore, to a critical turn in our behavior where habit alone is inadequate. The highest plane of human conduct involves deliberative choice of a goal for the realization of which all energies are concentrated. Such forms of behavior are known technically as *volitions*, and popularly as *acts of will*.

The Meaning of Will.—The many explanations of will can be grouped into two classes. The first regards will as a faculty of mind which assumes control of all our executive work. Popular explanations of personal success or failure are often made in terms of the old formula, "He succeeds because of his strong will" or "He failed because of his weak will." It seems as if there were a monarch, an independent ego, within each of us; if his rule is absolute, then we are strong-willed, but if he vacillates, issuing in his uncertainty, commands and countermands, then we are weak-willed. A grim determinism is implied in this conception of will.

The second set of explanations of will is functional and regards will as an active aspect of ideas and emotions; as "accumulated tendencies toward action";² as the active phase of the whole mind. Of functional explanations of will there seems to be no end. To the behaviorists, will is the sum total of an organism's response to his environment. To some will is the product of the total kinæsthetic sensations; to others, the active aspect of emotions; to James, it is the motor side of all consciousness. One's conception of will is often determined by his philosophical outlook and his religious bent.

A few illustrations may sharpen the meaning of the functional conception of will. The voice, the speech, the point

² F. E. Bolton, *Everyday Psychology for Teachers* (Charles Scribner's Sons, 1923), p. 311.

of view exhibited by a chance acquaintance, all happen to please us; by various and devious methods we place ourselves in his path. We experience an unmistakable pleasure in his company. Our preferences take on an active aspect and lead us to invent occasions for meeting. A teacher asks the class to remain quiet while he explains and performs a new calisthenic movement. Those who are attentive, image the movements, and, quite unaware, imitate the teacher and thus disobey the injunction, "Remain quiet." Their inattentive classmates have no difficulty in attaining absolute obedience; they are not picturing what the teacher describes and, therefore, feel no impulse to reproduce the exercises demonstrated by the teacher. Think of whistling; what an effort to keep the lips from puckering. We saw how right James was in his insistence that a disembodied human emotion is sheer nonsense. Who has felt despair without experiencing a choking sensation in the throat, a moist eye, actual disgust for food, and painful visceral disturbances? Every vital mental state seeks expression. We may wear a mask to hide our thoughts but they will express themselves through changes in the rate of respiration and heart action. "All these impulses (tendencies to action, passions, and concerns) . . . get woven, by the laws of habit, into a system of ruling motives which express themselves without, in our regular fashions of conduct. The whole of our inner life, viewed in this aspect, appears as the purposive side of our consciousness, or as the will in the wider sense."³

Implications in This Psychological Conception of Will.—

1. *Will Is Trained Indirectly.*—Just as emotions are refined through ideas, so too, is impulse to action directed by developing proper habits, attitudes, and ideals. Knowledge of the right and a mind set for it form the first steps in training for proper conduct. Merely knowing the right is no assurance that action will be right because there may be strong inner drives to contrary ends. But, all other conditions under control, an ideal becomes the initial step in desired behavior.

³ Josiah Royce, *Outlines of Psychology* (The Macmillan Co., 1904), p. 367.

2. *Effectiveness of Positive Commands and Suggestions.*—Discipline must be organized on a positive rather than on a negative basis; commands should indicate what to do, not what not to do. Training based on a series of "Don'ts" is ineffective. The positive idea may loom up with irresistible force, while the negative seems only a passing suggestion. In the orders "Don't scratch your desk!" "Don't look at your neighbor's paper!" the ideas, "scratch," and "look," have a fascination which places them in the focus of consciousness, while the "don'ts" are relegated to the marginal fringe. The action suggested is concrete, the negation is abstract, hence action is likely to take precedence over negation. It is harder to repress the tendency to action than to carry out another action. "Keep your desk looking new" is simpler to carry out than "Do not mutilate your desk," although both lead to the same end. It is advisable, therefore, in a penmanship lesson that stresses *m*'s and *n*'s to say, "Round tops," rather than, "Do not point the tops." The repetition of "Rounder! Rounder!" as the children write, serves as persistent suggestion to the mind and sets it off towards the desired end. And, finally, it must be remembered that youth is the period of action; when the whole system is attuned for expression, parents and teachers, too frequently, have little more to offer than a series of injunctions.

3. *Limits of Free Will.*—While we have denied a pre-terminated will, we are not justified in assuming a perfectly free will. Within the limits of inherited tendencies and acquired attitudes and habits, we can be what we will. What we will to do is always in consonance with what we have done. He who has been honest, industrious, and generous cannot will to be dishonest, indolent, and mean. Man wills in terms of what he has habitually willed, just as he thinks and feels in terms of what he has thought and felt in the past. The law of apperception is all controlling.

The conclusions for volitional training are evident. We must lay a strong foundation of worthy impulses, attitudes, and ideals. These accumulated tendencies form a powerful stock of drives and inhibitions. Human conduct is, therefore,

like the rolling boulder, constantly gathering momentum in its destined journey, each turn making the next stronger and inevitable.

Analysis of Volitional Control.—*Ideomotor Theory Challenged.*—James⁴ did much to popularize the ideomotor conception of volitional activity. He says:

There is no sort of consciousness whatever . . . which does not directly and of itself tend to discharge into some motor effect. The motor effect need not always be an outward stroke of behavior. It may be only an alteration of the heart beats or breathing, or a modification in the distribution of the blood, such as blushing or turning pale; or else a secretion of tears, or what not. But in any case, it is there in some shape when any consciousness is there; and a belief, as fundamental as any in modern psychology, is the belief at last attained that conscious processes merely as such, must pass into motion, open or concealed.

This theory Thorndike reduces to two premises, neither of which has a basis of experimentally obtained data:

1. A kinæsthetic image must always be the cause of an act.

2. An idea of movement tends to realize itself in action. Thorndike asked a group of students to think of the appearance of their written names and then at a signal to write them or not, as they saw fit. Most wrote their names. When questioned concerning the imagery antecedent to the writing, many replied, "An image of myself writing" and "An image of my name." But both groups, those who wrote and those who did not, reported the same imagery. Thorndike argues, therefore, that the images came as a consequence of the idea, "write your name"; they were not the cause of the writing.⁵ The mere fact that a choice was given may have aroused in the minds of those who did not write, the idea, "I want to

⁴ William James, *Talks to Teachers* (Henry Holt & Co., 1899), pp. 170-171.

⁵ E. L. Thorndike, "Mental Antecedents of Voluntary Movements," *Journal of Philosophy, Psychology, and Scientific Method*, Vol. 4 (1907), pp. 40-42. See also "Ideomotor Action," *Psychological Review*, Vol. 20 (1913), pp. 91-106.

see what happens if I do not write my name." Without a further knowledge of the imagery in the minds of the two groups of students, no conclusion can be reached. Against the orthodox opinion, Thorndike contends that an idea or any mental state has no tendency to call up an act aside from its use, disuse, satisfaction, and discomfort. Conveying to children the ideas and ideals of literature and history, will not, of themselves, he argues, give the newly induced mental states power to force ethical response. Pillsbury upholds Thorndike's position and observes that an action may take place, not because of the idea but rather because of the lack of it. He falls back on James's favorite illustration of the universal reluctance to get out of bed at the appointed time. We may arise, Pillsbury insists, not because we think of an impelling reason, but rather for no reason at all—merely because we are habituated to the act of rising at a fixed time. But the ideomotor theory does not deny habit nor does it insist that motor consequences of an idea must be positive. The students who did not write their names exercised as much volition as those who did. James's theory has been challenged but, thus far, not disproved. Moore⁶ suggests a modification of James's statement, "Some ideas have characteristic motor expressions, and some, and perhaps all, ideas of movement have a definite tendency to flow over into action."

Relation of an Idea to Its Motor Expression.—Even though we accept Warren's⁷ statement that will is the "experience which accompanies ideomotor action," it does not follow that an idea of an act tends to produce that very movement. The most that we can say is that an idea of an act tends to produce a movement of the same sort. Of course, there is no inherent bond between an idea and a fixed or invariable motor response. The first form of expression of an idea of an activity may be the product of mere chance. If the response

⁶T. V. Moore, *Dynamic Psychology* (J. B. Lippincott Co., 1924), p. 330.

⁷H. C. Warren, *Elements of Human Psychology* (Houghton Mifflin Co., 1922), pp. 275-280.

is inappropriate, then it is changed and changed until it becomes correct. Each repetition of the correct reaction makes the next correct reaction easier. Adequate motor responses must, therefore, be learned. Volition is hence *selective* and involves *deliberation* and *choice*, seeking the most appropriate rather than the habitual response.

Conceptual Control of Voluntary Movement.—In opposing the ideomotor theory, some psychologists believe with Woodworth,⁸ "A naked thought can perfectly well perform its function of starting the motor machinery in action and determining the point and object of its application." The theory of conceptual control of voluntary movement precludes the necessity of antecedent kinæsthetic images but it affirms that, "Voluntary movement is initiated by (a) understanding of what is to be done and (b) a neuromuscular set, specific to the movement to be performed." It is difficult to conceive "a naked thought," however figuratively we regard the expression, which to Angell is a "psychological heresy."

Inhibition of Impulses.—*The Conflict of Ideas for Expression.*—Two ideas leading to contrary lines of action may be uppermost in mind: shall we multiply first and then subtract or shall we subtract first? Shall the composition begin with one thought or with another? Shall I say "none is" or "none are"? The issue may be a moral one: a youngster is tempted to stay away from school on a beautiful spring morning. In all these cases, will attaches to the idea that calls up the greatest number of associated ideas, habits, emotions, attitudes, ideals, etc. To illustrate, a child, reported to the school principal for insubordination to his teacher, is told to apologize at once. In the ensuing moments, he may be tossed about by impulse and counter-impulse, from obedience to further defiance. *Apologize*: the punishment will be mild; parents will not be notified; mother will not be hurt; father's anger will not be aroused; the teacher with whom I must live for many more weeks will forgive; I should not have spoken so imper-

⁸ R. S. Woodworth, "The Cause of a Voluntary Movement," *Studies in Philosophy and Psychology by Former Students of Charles Edward Garman* (Boston and New York, 1906), pp. 351-392.

tinently even though the teacher didn't see all that happened and blamed me unjustly. *Stand your ground, don't apologize:* it was John, not I, who caused the disturbance by intentionally dropping his book; I can explain the situation at home; my classmates will think less of me if I apologize. So the mind goes from impulse to anti-impulse, moved by this set of ideas and by that emotion, checked by another set of ideas and attitudes, until one side gathers an overwhelming stock of associations and its promptings are obeyed.

Three cautions must be observed. First, the stock of associations consists not only of ideas alone, but also of habits, of inherent and acquired attitudes, and of impulses. The child who is temperamentally timid, apologizes regardless of the number of ideas that argue for the contrary procedure. Deliberation may not be a necessary antecedent of a volitional act; custom, desire to please others, or religious standards may give adequate sanction to the action about to be taken.

A second caution is sounded by Dewey:⁹ "It is a grave error to suppose we have no preferences until there is a choice. . . . We are always biased beings, tending in one direction rather than in another. . . . Choice is not the emergence of preference out of indifference. It is the emergence of a unified preference out of competing preferences."

Third, we must guard against the notion that will is measured by the intensity of the conflict for a socially sanctioned outcome. In popular thought, he who is tempted to play but sets the game aside for his task, or he who is tempted to look at his neighbor's test paper, then steels himself and turns his eyes away, gives proof of strong will. Are we to believe that he who does his duty or who keeps his eyes on his own paper without a struggle is therefore possessed of a weaker will? Psychologically, a strong will is a trained will that does right from force of habit without passing through a struggle in which the outcome is in the balance. He who wins in the face of strong temptation shows a developing

⁹ John Dewey, *Human Nature and Conduct* (Henry Holt & Co., 1922), pp. 193-196.

will; he who does right because that is his only desire has a will already well developed.

Inhibition and Will Power.—Volitional action may be negative as well as positive. To decide not to express an impulse and then to set the whole neuromuscular system in reverse is as much an act of will as to let the drive to action have its full sway. This negative application of will is called inhibition. It produces sufficient hesitation and delay to permit a reasonable measure of deliberation. "He who hesitates is lost," sometimes, but he who never hesitates is always "rushing in where angels fear to tread." Life would be a long series of tragic errors and regrets if every passing whim actually worked itself out in action. Inhibition bestows upon us the gift of the suspended judgment.

The development of inhibitions constitutes a very significant phase of moral development. The methods by which this can be accomplished are set forth and fully illustrated in the discussion of the control of instinctive impulses—disuse, repression, punishment, substitution, and guidance securing the expulsive power of higher emotions, sublimation, and catharsis.¹⁰

Transfer of Control.—There is no justification for the belief that volitional control developed in one experience will serve us in all others. Will power is subject to the same restrictions of transfer as other mental powers. Students persistently dishonest in examinations may nevertheless maintain high standards of sportsmanship in athletics. A stammerer may through his native grit exercise a high degree of control in applying himself to his studies but exhibit weak control over his speech. A mother who shows ordinary concern about her own health, may exhibit so much worry when her child is ill that she induces in him a neurotic fear of ill health. Will power is specialized and operates in fields closely allied to those in which it was initially developed.

Factors in a Voluntary Act.—In tracing the genesis and progress of a voluntary act, we find:

¹⁰ See pages 377-380.

- (a) an idea of the end to be attained
- (b) a desire for its attainment
- (c) a belief in the possibilities of its realization
- (d) a memory of similar action in the past, and
- (e) a sense of effort with its accompanying strain towards the achievement of the desired end.

To have no foresight of an end, whether distinctly conscious or only vaguely felt, precludes desire that initiates a volitional act. But mere desire is altogether insufficient to carry the act to its rational end. A child yearning for the prize, may make no effort for it if he feels the race is hopeless; belief in the possibilities of a successful issue is hence a third requisite. But this faith in one's capabilities is impossible unless there is alive the memory of kindred action in the past. No voluntary act is ever performed unless the same or a very similar one has been performed involuntarily before. "No creature," James tells us, "not endowed with divine power can perform an act voluntarily for the first time." The genesis of voluntary action lies in the motor memories that can be aroused. Every seemingly new action when analyzed shows that its constituent elements were involuntarily performed in the past.

Character and Personality.—Theoretically, a distinction can be made between character and personality. The moral tone of the permanent trends that result from the integration of all his attitudes towards experience, constitutes an individual's character. Personality, on the other hand, is measured by,¹¹ "the entire mental organization of a human being at any stage of his development." Hamlet was filial, honest, loyal, and courageous; his character was exemplary. But he dissipated every vital impulse in the grim fatalism born of his pessimism. It is, therefore, alleged that his personality was weak. Personality, it would seem, is bigger, deeper, richer than character—the prevailing moral color of voluntary activity. The person of unimpeachable integrity who finds his every significant conviction inhibited by a sense of inferiority,

¹¹ H. C. Warren, *Elements of Human Psychology* (Houghton Mifflin Co., 1922), p. 360.

by compulsive ideas of fears, and by anxiety neuroses of every sort, exhibits weak personality but satisfactory character. The behaviorist regards personality as¹² "an individual's total assets, (actual and potential) and liabilities (actual and potential) on the reaction side." This distinction between character and personality can be maintained when considered apart from actual conduct but it fails utterly when applied to volitional behavior of real people in real life.

MORAL EDUCATION

The Plea for Character Training.—Character is the resultant of the play of forces prompted by native and acquired patterns of behavior. If each child were given a helpful inheritance, an intelligent home, a well-balanced regimen of life, and a social environment free from undesirable influence, the school would probably encounter no serious difficulty in the problem of character development. But many children have neither this heritage nor this environment, and thus the school must carry the burden of these other social agents as well as its own duties in order to achieve its major aim—character training. Pressure of poverty, poor housing, urban congestion with its attending demoralization, lack of play space and opportunities for wholesome recreation, the weakening of family ties, the alienation of the masses from the church—these are only a few of the desocializing forces to which critics of our day ascribe the social unrest. So long as these exist in the community, the school must dedicate itself to the development of moral fiber in order to produce a socially minded citizenry.

The Means That the School Can Employ.—The school cannot meet the whole problem of social maladjustment, but it can do much through its discipline, its extracurricular activities, and its program of study. School discipline is a system of social control undertaken not in the interests of the school but of the child. It concerns itself with developing

¹² J. B. Watson, *Psychology from the Standpoint of a Behaviorist* (J. B. Lippincott Co., 1919), p. 397.

social habits of mind and action so that children learn to live together helpfully and happily. It succeeds only as pupils become active participants in the machinery of control and identify themselves completely with its aims. Through its extra curricular activities—clubs, assembly exercises, communal projects, athletic activities, dramatics and pageantry, school journals, membership in leagues of youth—the school affords opportunity for the development of leadership and capacity for the coöperative conduct of an enterprise. These nonacademic activities develop special interests and teach young people intelligent use of leisure. Since these topics were discussed at length in earlier chapters, we shall turn to an evaluation of direct character training through instruction.

Two Schools in the Teaching of Ethics.—There is a persistent demand that the school add to its present highly departmentalized program of studies, another subject, ethics. This should be taught through carefully graded subject matter in every grade of the school system. There are those who strongly oppose the isolation of experiences essentially social and moral in their implications. They urge that ethics be taught not in periods especially reserved for it but rather that this teaching be done incidentally, when an appropriate human background arises in literature, history, civics, or in the incidents of the classroom. Only when taught through a real situation where there is a gripping conflict, will ethics lessons generate that motive power which makes them springs to action.

Many sincere teachers feel that the advocates of specialized moral instruction are overreaching themselves in their enthusiasm. They argue that ethics is the science of righteousness; it is an explanation of conduct. Ethics makes an intellectual appeal that brings conviction but leaves a wide breach between conviction and action. Dean Inge, the "gloomy dean," brings a telling indictment against occidental civilization after its twenty centuries of preaching and teaching of Christianity. In France moral instruction has long been dignified by a very prominent place in the curriculum,

yet the French teacher is most eloquent in expounding the limitations of formal ethics teaching. The priggishness that some children develop and the hypocritical twaddle in which others indulge are not offset by the values of the systematic analysis of ethical conflicts. The adult moral judgments that they voice are not conducive to free and sincere expression of child interest. Judicious guidance in meeting the insistent demands of life, not the conscious analysis of abstract morality, trains for ethical conduct.

The proponents of direct moral instruction insist that the case against them is overstated. While knowledge of the right is no guarantee that conduct will be right, ignorance of right standards makes moral conduct, at best, a mere accident. The immature child is not asked to study the science of behavior but to understand the social significance of the problems that arise in communal living. Not all adolescents nor even preadolescents are ready to accept on faith the standards of right and wrong imposed upon them. Such children need rationalization to guide them in their voluntary behavior. Systematic and graded ethics teaching does not preclude study of moral situations that arise in all studies and in the business of the classroom or the school; it insures sympathetic understanding of basic human relationships.

Suggestions for Character Training.—*Habits of self-help* must be developed early in the child's life. Children should learn to feed themselves, to dress themselves, to devise their own occupations, and to care for the things that are theirs. Motor culture is not unrelated to moral culture.

The *discipline* of home and school must be *based on understanding of social need*. Children should be led to perceive that if each lived his life apart from others, fewer restrictions would be necessary. Once the child comprehends the social need for any regulation of school or home, he should be denied free choice in the matter of obedience; he must obey. What we must strive to avoid is overobedience, an overemphasis on slavish acquiescence to every demand. Every child should be required to give a full measure of rational

obedience. Blind obedience is necessary on occasions, but only on occasions. The routine of a well-established home or school usually reduces these occasions to a surprisingly small number.

Foster self-confidence by suggesting to the child the power of his own will. Tell him he can succeed and help him to anticipate success. Such suggestion does not blind the child to his limitations; on the contrary, it enables him to achieve the full measure of his capabilities.

Will is developed in every voluntary act and children should be allowed freedom of choice on every appropriate occasion. As early as is consonant with safety, children should be allowed to find their friends, make their games, and go their way free of the watchful eye of parent or nurse. Prolonged or injudicious supervision develops, with alarming rapidity, a feeling of inferiority that persists even in maturity.

Childhood is enriched by life in a group. In his club, the child learns the art of self-government and self-control. In the realization of the full significance of his own rights of freedom of speech and action is born respect for the rights of other free agents.

Our list of suggestions is not complete. It should be supplemented by the aids that are set forth in earlier discussions of emotions, instincts, habits, conditioned reflexes, sex education, and similarly appropriate topics.

How to Inculcate an Ideal.—A helpful plan for teaching an ideal of conduct, formulated by Charters,¹³ consists of the following steps:

1. Create the desire
2. Diagnose the situation
3. Develop a plan of action
4. Require practice or execution of the plan
5. Generalize the ideal or ideals involved

A sixth-year class found its work in certain subjects greatly retarded by the range of abilities of its members. The teacher

¹³ W. W. Charters, "Five Factors in Teaching Ideals," *Elementary School Journal*, Vol. 25 (1924), pp. 264-276.

pictured the situation as she saw it. Some who felt themselves retarded were frank in voicing their grievance. One or two who were responsible for the condition acknowledged their fault and expressed their sincere regrets. Out of the discussion grew a genuine desire on the part of all to correct the situation. The class then took up the reasons for this uneven ability and concluded that the fault lay in native differences of ability, varying preparation, lack of attention, inadequate study, and incorrect methods of study. The situation diagnosed, there was a general demand for a solution. The teacher suggested that she would indicate those who could undoubtedly do better work through closer attention or through more conscientious study or through more efficient study procedures; she would then assign each of them to a classmate who, she had reason to believe, could give help according to the need. The teacher agreed to remain after school hours for consultation with those in monitorial capacity or those who felt they needed more experienced guidance. The plan was accepted cheerfully, the class was organized accordingly, and weekly reports were made out by those giving and those receiving aid. The plan worked for many weeks; the children seemed to enjoy the work in teams. When especially encouraging progress was discovered, the teacher pointed it out and asked the class to think of other ways in which any individual could be helpful to his group. Little by little, the attitude of helpfulness was applied to athletics, to members of the family, to adults as well as to people of one's own age, and to strangers in the local community, until the specific ideal was associated with a great variety of human relationships. The teaching technique that followed the plan we outlined, did much to round out this specific experience and to increase its value by extending its scope.

Evaluation of Instruction in Morals and Conduct.—There is a far cry between the promise and the result of moral instruction. This discouraging breach is produced by many conditions. First, the school is dedicated essentially to an intellectual task, its protestations to the contrary,

notwithstanding. In educational conventions, character training is accorded the place of honor among the objectives of the school. In the daily work of the classroom all energy is focused on acquisition of as much of the overburdened curriculum as possible. Classes are large and results are measured in terms of scholastic attainment. Nor must we forget that not all teachers are temperamentally qualified to arouse the basic impulses that fashion moral behavior.

Second, moral conduct is a cumulative product of years of experience and earnest reflection by a maturing mind. The teacher must never lose faith in the belief that every desirable habit, every social attitude, every ideal implanted in the minds of young pupils will come to fruition in good time. The results of the teacher's labors may be delayed but they are not wholly lost.

Third, character is a composite result of many factors, one of the least important of which is instruction in morals. The quality of inheritance and of environment, the prevailing tone of personality, sex urge, health, economic and social advantages, the temperament of parents, the type of the home—these and innumerable other factors are the materials out of which character is molded. The hope of society for a new generation of worthier men and women lies not so much in classroom teaching as in effecting deep-seated changes in our social structure.

SOME CONDITIONS AFFECTING VOLUNTARY ACTION

Meaning and Scope of Mental Hygiene.—With the conviction that the school educates the whole child, has come an increasing demand that the teacher know the laws of hygiene, so that pupils may be guided to better health. But normal minds, like normal bodies, are subject to ills and need guidance to reestablish normal functioning. Mental hygiene is not concerned with the treatment of feeble-mindedness. It studies the causes that produce disturbances in normal minds and the means of preventing these minds from attributing wrong values to experience and thus acquiring perverted atti-

tudes towards life. We shall, therefore, summarize some of the besetting ills of normal minds and outline suitable corrective measures.

Anxiety and Worry.—Anxiety or worry may be temporary or chronic, justified or exaggerated. One expects anxiety over the outcome of an important examination, the serious illness of a friend, or the loss of a cherished possession. To experience no anxiety under these circumstances is unnatural and abnormal. Nervous people lose no occasion for worry: a slight indisposition of a loved one calls up possibilities of serious illness, for do not some of the most dreaded diseases of children begin with just such mild malaise? The impending test calls up to their minds all the possibilities of failure but none of success. Many of the anxieties of childhood are induced by unsympathetic teachers, by excessively rigorous and repressive discipline, and by punishment for inability to attain scholastic proficiency beyond the child's abilities, or for unintentional infraction of school law. Another set of anxieties can be traced to home conditions: illness of parents, economic uncertainty, nagging parents who harass the child, or oversolicitous parents who exaggerate petty ailments and hygienic routine.

Most people, young or old, given to chronic worry, seem to have an inherited predisposition to overconcern. Their lives are made up of an endless series of anxiety neuroses. It is futile to tell them about the physiologic consequences of worry because they either know them or develop another anxiety—they begin to worry because they worry. The bromidic advice not to worry is meaningless to the stupid and extremely annoying to the intelligent victim of anxiety. The only constructive measure left us is prophylactic—to reduce those conditions of home and school that are likely to give rise to needless concern.

The Sense of Inferiority.—*Illustrations of Inferiority.*—An important form of neurosis, exploited by Alfred Adler, is the feeling of personal inferiority. People of distinct ability may be excessively shy or modest or timid. A person who has seldom failed in any enterprise often shows exaggerated re-

luctance to begin a new experience. In many people, achievement falls far short of ability. These defects of behavior are ascribed to a sense of false inferiority which nevertheless inhibits the full expression of their abilities.

Its Causes.—Inferiority has its origin in failure, usually repeated or impressive failure. Success, repeated or significant, that follows the birth of a sense of inferiority, may be unable to eradicate it. It is common to all children at some stage in their development because youth is the period of failure. Occasional feeling of inferiority may serve as an antidote to a blustering, exaggerated ego; but continued feeling of inferiority is mentally unhygienic because this infantile underevaluation of self is perpetuated and sets up interferences that cling throughout the years of maturity. Among the causative factors we find:

(a) Physical defects; Adler traces most, if not all inferiority to organ inferiority, such as a defective sense organ, or a crippled arm or leg.

(b) Unfortunate home training; fault-finding parents often make a child feel that his life is a continuous and uninterrupted failure; coddling parents who do too much for the child, interfere with the development of self-reliance; the overhygienic home is apt to stress avoidance of ill health rather than maintenance of health and thus sets up a feeling of health inferiority in the child.

(c) School practice; grades obtained by pupils are publicly announced; the less competent are held over and are known among their classmates as repeaters; gradation of pupils by segregating the superior, the average, and the slow groups stigmatizes those in the last group and, too frequently, ascribes their failure to willful neglect, whereas most of them are the victims of their meager endowments.

(d) Lack of intelligence; in competition with others of similar age and training, the individual comes to a realization of his comparative inferiority.

(e) Neurotic predisposition; normal individuals balance failure against success, but others notice only those who excel them, never those whom they excel. This latter group seems afflicted with a diathesis to depression and worry and apparently welcomes any aspect of an experience that justifies an occasion for brooding.

Its Prevalence.—The inclusiveness of these causes may explain the prevalence of the sense of inferiority. It is probably no exaggeration to assert that every individual has a feeling of inferiority about health or athletic prowess, or speech, or creative ability. But the well-balanced do not permit their inferiorities to disintegrate their personalities; they may even be stimulated to attain unusual excellence in other fields as compensatory attributes. Adler cites the story of Demosthenes who had real cause for a feeling of inferiority and concludes "The foundation of all ability is in disability."

An Explanation of Defective Personality and Delinquency.—Many students explain unpleasant personalities, and even delinquencies, in terms of compulsive ideas of inferiority. The braggart, the bully, and those given to indiscriminate use of sarcasm are merely hiding an inferiority. Who does not escape from his inferiority in daydreams? In them we exhibit the leadership, the creative powers, the combativeness, or the courage we lack. Since we cannot exercise these powers in a real world, we do so in a world of our own making. The child who counts neither in athletics nor in class studies often becomes overassertive, and at once more timid natures regard his courage with envy. A child who has nothing to commend him to his playmates may steal money and amass an ample stock of athletic accessories. Now both teams are eager for his membership. Every individual wants to belong; he must count; if not by fair means, then by foul, but count he will.

Prophylactic Measures.—Preventive and ameliorative measures lie in sympathetic interpretation, by adults, of children's success and failure. Honest effort that does not eventuate in productive achievement should be recognized by judicious praise; satisfactory performance should be appropriately recognized; children's results should be judged relatively, not by an absolute standard, but in terms of their capacities—these are the practices that take the sting out of failure and make success a goal attainable by all. The full significance of the psychology of success is still an unexplored field.

Phobias.—Normal minds are beset by fears—fear of darkness, fear of heights, fear of animals, fear of strange sounds, fear of rapid movement, fear of disease—endless fears. Who does not count among his intelligent friends people who will not ride in taxicabs, or who refrain, when possible, from touching doorknobs, or who become semihysterical at the proximity of a dog, or who refuse to walk through tall grass or underbrush at night? These fears, we saw, are usually conditioned reflexes and have their origin in extremely unpleasant experiences. There is always a basis of fact for any of these phobias. Taxicabs are in frequent collisions, doorknobs have been touched by bacteria-laden hands and snakes do wriggle their way through grass. The victim of a phobia merely fails to take into account the law of chance. If contact with bacteria led directly to illness, then all physicians would die young. The one slim chance becomes, to these victims of phobia, the inevitable consequence and completely overwhelms reason and volition.

Fear must never be used as a mode of punishment. Locking children in dark rooms or threatening them with visitations of monsters, real or imaginary, gives rise to fear neuroses which play havoc with future peace of mind. An equally vicious practice, employed frequently by parents of superior training and intelligence, is threatening illness. The sensitive mind of a young child quickly makes the association, and fear of sickness thus becomes an impelling factor in the child's behavior. Fear of fear is the only fear that some mental hygienists respect. But even this fear may well be condemned.

Defense and Escape Mechanisms.—The will to be right is perhaps second to the will to live. The whole mental organization rises, at times, to save us from a disagreeable experience or to help us escape from an irksome situation. The defense that is set up is no consciously devised avenue of escape. It is a lie in fact but rarely in spirit.

Children who have a strong aversion for school have many ailments before nine and none after three. Abdominal pains, vomiting of breakfast, headache, and nausea all disappear when the child is assured of a day's respite from school at-

tendance. A capable student who thought that the requirements of his medical school were beyond his abilities complained of "severe headaches when I begin to study; these are followed by shooting pains in the ears and dizziness. When I put the book aside, all this soon disappears." The young man was led to believe that he was suffering from eyestrain. The oculist's prescription called for the duplication of the old lenses in new frames. The encouragement of intimate friends led the student to apply himself with greater determination to his work. As his grades improved and his distressing symptoms decreased, he ascribed his physical improvement to the new glasses; his college adviser, however, to the changed circumstances that made the escape mechanism absolutely unnecessary. It was commonly reported, during the World War, that while there were many cases of shell shock among the men with minor injuries, there were very few among the severely wounded who were assured that their disabilities precluded their return to the front.

These are examples of elaborate defense mechanisms, but most of us set up simpler escapes. We forget unwelcome appointments made under embarrassing circumstances; the mere indisposition of a member of the family is regarded as sufficient justification for telephoning our excuses. But a pleasanter engagement prompts us to reason: "I cannot be of service if I stay; this is a slight cold that will run its course; if I break my appointment, he may think that he is really ill; for his sake, I had better go." Defense mechanism, the clever rogue, is at work.

Students who know as many reasons as their teachers for condemning cheating at examinations, nevertheless, continue the arts of "cribbing." Some are hardened and give the practice no thought. The novices are visited by qualms of conscience and soon evolve a justification: "What if I really studied the notes, I'd forget them anyhow. If he wants honest work, why doesn't he maintain rigorous supervision? By his laxness, he tempts us; my cribbing is as much his fault as mine. Besides, why isn't he reasonable in his demands? He asks so much of us that we are driven to prepare memoranda

for surreptitious use." But throughout this flow of sophistry, the student knows that his excuses belie his convictions; that he is building his defenses.

Young children often tell of "the grudge that the teacher has against me"; of the "pets," the especially favored few; of unreasonable demands—all to build up an excuse for inability or unwillingness to participate wholeheartedly in the activities of the class. Pupils who have obtained low ratings in a test often dwell at length on the unusual severity of the test, on the strict marking by the teacher, on the inadequate time allowed for a paper of such length—complaints without foundation, concocted to justify failure and save their self-respect.

Parents and teachers should be on guard against these defense mechanisms, should point out the spuriousness of the reasons, and should stress the fact that there is intent—perhaps not wholly deliberate—to create a false impression of a situation. These defenses and escapes should be interpreted for the victims as forms of self-pity, as expressions of weakness, altogether unworthy of robust young people.

Compensations.—When an individual has an undoubted weakness or has suffered an overwhelming loss, his mental organization may set up substitute activities or interests. To avoid the conflicts that invariably arise in these disturbing situations, a refuge is established. The childless woman often bestows lavish affection on an animal. The boy who lacks leadership and is always dominated by others, develops an intense attachment for his dog which obeys his commands. In reveries the timid are brutal and impulsive. In his imaginary life, the child humbles to the dust the bully whom he cannot subdue in real life. Small wonder that children go wool gathering so frequently.

There is no sharp and final distinction between compensatory and defensive mechanisms. Both seek to reduce the conflicts that must inevitably arise out of the multiplicity of our experience. It is important to remember that all these explanations of behavior, reasonable though they sound, are mere inferences, derived from clinical histories, and not from

accurate data under scientific control. Our analyses of compensations and defenses may themselves be the defensive mechanisms of professionally minded teachers and psychologists who are keenly alive to the crudeness of their techniques.

Conflicts and Repressions.—Most of the troublesome forms of behavior seem to arise in a conflict, in a struggle of incompatible motives. In infancy, the controlling desires are sensory—to see, to hear, to touch, and to do. These the child is not always permitted to gratify and a conflict at once arises. In childhood, the struggle between personal desire and social sanction leads to disobedience, deception, and stealing. In adolescence, the desires for sex gratification and for new experiences are especially pronounced. Innumerable natural desires, therefore, create conflicts and must, for social reasons, be repressed. The full significance lies not in the conflicts but rather in the suppressions, for these latter tend to disintegrate personality.

The child who is motor-minded and does not take kindly to the intellectual type of education may lack courage to bring the situation to an open issue before parents or teachers. In his silence he seeks to attain his end through indirection. He deliberately neglects his work and becomes inattentive; his parents finally accept the recommendation of the teachers and curtail his formal education. No one can measure with any degree of accuracy the extent and the character of the inferiorities set up after months of such conflict.

A teacher, judged professionally very competent by his superiors, loses faith in the routine of instruction. "The intelligent learn, but they would probably learn without me; the mediocre and the slow pupils go through the motions and achieve very little; it all seems like an idle gesture," he explained months later when he understood the situation better. But faith or no faith, he had to go on for economic reasons. He feared to discuss his doubts with any of his colleagues. He continued in silence and soon lost his respect for his chosen calling as well as his self-respect. A period of acute depression capped the whole sad experience.

How shall we help the victim of conflict and its attending repression? The Freudian will probably advise, "Expose the repressed idea, give it its true value and the sunlight of reason will dispel the mental fog." But how can the analyst make sure that he has come upon the very conflict and the repressions that have upset his patient? For every instance where facing one's suppressed ego has led to clearance, we can present another to prove that the practice is distressing and even dangerous to the patient. We may even ascribe the mental conflict to the imperfect functioning of that catch-all of modern medicine, the endocrine glands. If we do, then we may label the trouble but that may not necessarily help. We must recognize that neurotics are stubborn and require sympathetic and patient guidance. Again, hope lies in prevention rather than cure. Every child should be in intimate relationship with at least one adult to whom he brings his problems, confident of sympathetic and helpful response. The fortunate child can make his parents his confidants, but not all parents nor all teachers are by temperament suited to the rôle of confidential adviser to youth.

The Principles of Mental Hygiene.—Introversion is the common name given to the practices that lead to excessive inferiorities, phobias, anxieties, defense mechanisms, and compensations—the variety of conflicts that set up serious dissociations. All normal people are mild introverts for they effect their escapes from unpleasant and distressing realities through their daydreams. The extreme introvert is an abnormal person with a highly perverted set of values. All normal people are extroverts for they find reality, in the main, worthy of recognition. McDougall¹⁴ conceives a scale showing extreme introversion at the left and extreme extroversion at the right, each quality decreasing gradually as the center of the scale is reached. The majority fall "in the middle region of the scale but inclining in various degrees towards one or the other extreme type." While the extreme introverts and extroverts are born and not made, the expe-

¹⁴ William McDougall, *Outlines of Abnormal Psychology* (Charles Scribner's Sons, 1926), p. 435.

riences of youth can do much to impel an individual towards one end or the other of the intro-extro-vert scale.

Since each of us has the potentiality for disturbances of behavior, the mental hygienists have formulated long lists of rules of mental living. We have discussed these at various times throughout our study. They urge utmost frankness in all human relations; the cultivation of self-respect; reasonable balance between self-assertion and submission; willing and cheerful acceptance of established social modes of living; avoidance of undue repressions imposed by an ultra-Puritanic regimen of conduct. In the end, all this counsel leads to the old Greek maxim, "Know thyself."

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QUESTIONS FOR DISCUSSION

1. Distinguish desire from tropism. Can desire be regarded, in any sense, as a tropism?
2. What is the popular meaning of will? Wherein do some of the fallacies of this conception lie? Formulate a definition of will psychologically sound. Explain any act of deliberative conduct in terms of it.
3. With ample illustrations, explain the place that habit plays in the development of control.
4. Distinguish between "moral ideas" and "ideas about morality." To what extent is the following statement true: "An idea is neither moral nor immoral; it is non-moral"? People do commonly speak of "moral ideas." What factor or factors determine the moral aspect or implication of an idea?
5. School people seem to be divided; some urge a special course in ethics or ideals of conduct; others, insist that these ideals be taught incidentally in other subjects. Discuss the relative merits of each position and state your own views with respect to the teaching of ethics.
6. Recall the conduct of a friend who exhibits enviable control in situations that would find another person weak. To what extent does he exercise this degree of control in all situations? Be specific in your illustrations.
7. Give instances of defects of character; of defects of personality. Show to what extent an individual with a highly satisfactory character may have undesirable personality traits. Is a pleasing personality ever found in people of weak character? Cite instances.

8. Indicate types of moral instruction or guidance that belong predominantly to (a) the home; (b) the school; and (c) the church. To what extent do they overlap? What conclusions for moral education can you draw from the facts you have marshaled?

9. Give instances from your own experience of each of the following:

(a) The child is weakened volitionally if too much is done for him by parents and guardians

(b) Blind obedience that is necessary

(c) Rational obedience that should supplant blind obedience

(d) A sense of inferiority arising from injudicious supervision of a child's activities

10. Select an ideal of conduct. Follow Charters' plan (see page 631) and outline your procedure for inculcating this ideal.

11. Dewey says: (a) "There cannot be two sets of ethical principles, one for life in school, and another for life outside of school."

(b) "The child ought to be judged by the same standards in school as the adult in the wider social life to which he belongs."

In what ways would a strict adherence to these principles change the character of the discipline in schools to-day?

Reword these statements so that they apply to the home. Do these reworded statements indicate radical change in methods of home discipline? Be specific.

12. Cite instances from the lives of your friends and classmates to show the need of mental as well as physical hygiene.

13. With respect to each of the following, state (a) its prevalence, (b) its probable causes, (c) its normal manifestations, if any, (d) a set of prophylactic and corrective measures—*anxiety, inferiority, defense or escape mechanism, conflict with resulting repression.*

14. Formulate as complete a list of rules of mental hygiene as you can. To what sections of this book will you turn for help and guidance?

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