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BOTH SIDES OF THE ROAD

By the Same Author & Artist

OUR BIRD BOOK

By the Same Author

TWELVE DAYS
LAST OF THE EBB
OLD ENCHANTMENT
ETC

(Frontispiece) Welsh Hill Farm



BOTH SIDES OF THE ROAD

A Book About Farming

By

SIDNEY ROGERSON

Illustrated by

CHARLES TUNNICLIFFE

COLLINS

ST JAMES'S PLACE LONDON



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To
Peter Graham Rogerson

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Foreword

SOME time ago Charles Tunnichffe and I collaborated on a book which we enjoyed making, and which was sufficiently well received to encourage us to consider making another. The problem was then to agree, first, on a subject which should appeal to us both and, second, on how to approach it. We talked about it and about without reaching any satisfactory decision.

It so happened that the first book had been dedicated to my daughter, so that it was not perhaps surprising that one day her younger brother should have awakened to the fact and demanded one for himself. I asked him what sort he would like, and without hesitation he replied, "A book about farming." He reminded me that when I had taken him for walks or out in the car I had always told him what was growing on both sides of the road, whether it was a clean field or a dirty one, and what kinds of cows and sheep were in it. "Write me," he asked, "a book about what is happening on both sides of the road." *Ex ore parvulus*. Here was the subject and the approach for which we had been searching.

This, then, is Peter's book, both as to matter and to title, but I have tried to write it, and Charles to illustrate it, so as to interest those of all ages who love the country and wish to know more about the farming scene. It is not a book for the expert. Farming is a subject which bristles with controversy, and I recognise that in trying to cover so much ground I have had to generalise and to simplify, and may therefore have exposed myself to counter-attack from one or other of the special brigades of agriculturalists who hold strong views on particular points. All I can honestly say is that I have tried to hold a middle position and to keep the objective point of view. I must acknowledge with gratitude the help I have had from my friend, Geoffrey Belasyse-Smith, who has not only kept me, I hope, from leaning too much to one side or another, but has allowed me to draw on his knowledge and experience; and from Professor Sir James Scott-Watson, who could find time amid all his multifarious duties to go through the MS with a small tooth-comb and suggest alterations and additions. I would also thank my good neighbours, Mr. Sidney Whiting of Barningham Hall and Mr. Alfred Clark of Mellis, for reading certain chapters and giving me the benefit of their expert advice.

*Barningham,
Suffolk.*



CHAPTER ONE

BOTH SIDES OF THE ROAD

IN the year 1919 I was waiting for a train at a small railway junction in North Yorkshire. It was early spring and around the little station stretched the fertile grainlands of the Vale of York. The only other prospective passenger was surprisingly a Frenchman, a war refugee possibly, who watched with eyes of wonder as one goods train after another clattered through the station, bearing southwards the coal and steel and machines from the mines and factories of Northern England and Scotland. Then I heard him say to himself in a reverent tone, "Quel pays industriel!"

It is as an industrial nation, a great wen of warehouses and workshops, that the world regards Great Britain, and has done since, as the fomentor of the Industrial Revolution of the early nineteenth century, we set in motion the drift from the fields to the factories. That also, it seems, is how the subsequent trend of our national economy has led us to regard ourselves. Yet the truth is that though we are by character certainly an industrial country, our greatest industry is still agriculture, the products of our soil and all that derives therefrom.

There are over 400,000 farmers in Great Britain. They employ nearly 1½ million people—about twice as many as are engaged in coal-mining—and farm more than 30 million acres. Farmland, in which is included the rough hill grazings, occupies more than three-quarters of our island, while all the cities, towns, roads, houses, gardens, mills and industrial plant cover no more than one-tenth. An even more astonishing measure of the importance of our agriculture is that the value of the farm produce of Great Britain is greater than that of Canada or Australia or New Zealand, which we are accustomed to think

of as the great reservoirs of the world's food. No matter that measured in terms of quantity, our harvests of wheat, oats or barley may seem minute beside the enormous output of the vast grainlands of North America, Russia or Australia, our yield per acre is roughly double the average of any of those countries. Not only is the quality of our arable crops equal to the best anywhere in the world, but the nature of our climate enables us to grow grass of a quality and quantity unexcelled by any other country. In short, for efficiency and versatility of cultivation, the British farmer and his men need acknowledge no superiors. The surprising thing is that we seem to care for none of these things, although twice in a lifetime war has shown each one of us how closely connected farming is with our very existence, and if we have had neither the will nor the sense to appreciate this for ourselves, the moral has been rammed home with all the weight of Government propaganda. Yet the mass of the people of Great Britain remain disinterested, and though we live in a world perilously balanced over the gulf of war and famine, seldom give a thought to how we are fed and how we are going to be fed in the uncertain future.

Yet perhaps this unconcern is not so surprising, since urbanisation has reached such a pitch that most of us are condemned to live in cities into which the sights and sounds and smells of the countryside cannot enter. The very soil from which comes all our food is tightly bound in brick, stone or concrete so that only in the public parks and gardens may we even set our feet upon it. And every day the towns grow bigger, the houses and the pavements creep farther and farther into the fields, and the farms are pushed farther and farther away. The modern city-dweller cannot see a cow or a pig-sty or a field of wheat from one year's end to another, unless he makes a journey into the country to do so. Indeed, he is so cut off from the countryside and so used to the sights, the noises and the smells of the town that his senses have lost their edge. To change the metaphor, they are out of natural tune. Some years ago I knew a dumpy, pale-faced little woman who worked a lift in a London office. All her life she had lived in rooms just off the roaring traffic of Oxford Street. One summer she was persuaded to spend her holiday in the country. It might be imagined that having passed her days amid that racket of hooting, clattering, banging and backfiring, she would have found village life too quiet for her. Not a bit of it. "Nasty, lonely place, the country," she told me, "and that noisy! What with all the birds shouting, the cows mooing and the dogs barking, I never got a wink of sleep." From her youth up she was so accustomed to the noises of the town that her ear did not even register them.

City life has become so remote from the farms that townfolk tend to forget the direct connection between the soil on the farm and the food on their tables. In the town, for example, the daily milk comes in sealed bottles. Our breakfast cereals are weird and wonderful things which look like dried leaves or flat loafahs. Our sugar is bought in cardboard packets from the grocer. Yet that milk has to be grown in the form of grass or root crops to feed the dairy cows. Those breakfast foods were once wheat or oats or barley, which had to be drilled, rolled, hoed and harvested before being stamped and twisted into the strange shapes in which we eat them. And our sugar comes from an ugly root like a large parsnip.



Thousands of acres of sugar-beets must be grown in our fields before they are pulped and steamed to extract the sugar. Most pathetic, the war-time evacuation of city children revealed that some of them were even surprised to learn that the beef they had for dinner had once stood on four legs. They recognised it only as meat which Mother bought from the butcher, not as part of an animal bred and reared on a farm.

Although it is perhaps understandable that we should forget our daily dependence on the soil, there is no excuse for such forgetfulness. Even if we have to make a journey to see our farms, this is an age of easy travel when all of us have the means to move about by road, rail or even in the air. As we travel by bicycle, car, motor-coach or train, we watch the fields on either side of us as they slip past. If we ride the skies in a plane the farmlands are stretched below



us like the chessboard country that Alice saw through the looking-glass. But, if any one asks what we see, nine out of ten are not unlikely to reply, "Oh, just fields." We seldom give a second's thought to what is growing in those fields, brown or russet in winter, green in spring, and gold and amber as harvest time draws near. Even if we are able, say, to tell the difference between a field of young corn or a pasture of grass, how many of us know what kind of corn it is or what quality of grass makes up the pasture? Is the corn, for example, wheat or oats or barley or rye? Is the grass a permanent meadow or a temporary ley? We see cattle grazing, but how many of us can tell whether these are bullocks fattening for beef or dairy cows yielding us their milk? Come to that, how many of us know what the men and women are doing in the fields as they work?

The sad truth is that outside of the farmers and those who work on the land, we know less about this all-important subject of how our food is grown than we do about any other. Test it for yourself. There are thousands who collect stamps, who know how a camera works, or who can identify at once the different

types of motor-car, or aeroplane, to every one who can tell a harrow from a combine harvester, or name even the common breeds of cattle like Jerseys, Aberdeen Angus or Dairy Shorthorns. We need not be technicians to know that a railway locomotive will not move without steam, which is raised by heating water in its boiler with coal burnt in its furnace. What few of us know is that soil will not move either unless it is properly fed, cultivated and rested.

The story of the countryside is as fascinating as it is important. It is a book which you can learn to read without difficulty, and once you have done so, you can add to your knowledge, and go on interesting yourself whenever you travel. On both sides of your road, or below you, the book will lie open. Its pages flick over as your car, train or plane speeds onward; but when you have the knowledge you can follow the story, however swiftly you move. The slower you go, either on foot or by bicycle, the better, of course, it will be, the more time you will have to look about you, and the less likelihood there will be of your missing any detail of interest.

Nowhere in the world do the pages of the farming book turn as rapidly as in this little island of Britain. In Canada you may travel by rail across vast plains where the farming scene remains the same one day after another, so that it is difficult to believe the train has moved during the night. Even in Europe it is possible to go for hours without much change; across Holland, for example, there seems no end to the flat lands with their dykes and their whirling windmills. But Britain is a country where the scenery changes every twenty or thirty miles, and, as the scenery changes, so does the kind of farming. There is small risk of the monotony that leads to boredom.

It may be both instructive and interesting to make two trial trips. We will do it the quick way by setting off first by road across the flat part of England from, say, Yarmouth on the East Coast. Even though you may not yet have learnt to read the farming book, you cannot help noticing certain things if you look. On the salt marshes which fringe the coast, bullocks will be grazing in the lush grass, but this green belt is soon passed, and we enter the rich ploughlands of Suffolk, a county with no hills but which is not flat. The land runs in gentle ripples like a summer sea. There are no large woods, but trees in plenty, especially twisted elms whose branches claw at the sky. The houses are washed different colours, buff, pink or pale green, and many of them are thatched. Here and there a windmill is turning, grinding corn as it has done probably for hundreds of years, for Suffolk, like most of this eastern part of England, is a grain-growing district. The fields are large, and nearly all ploughed to produce wheat, oats or barley and sugar-beet. You must be able to tell the difference between these—the wheat square and sturdy, the oats in nodding beads and the barley with its barbed whiskers. Sugar-beet you can distinguish by its shiny, darkish-green leaves. You may see some sheep, big ones with thick wool, black faces but no horns. These will generally be found in enclosures or folds of hurdles or wire-netting and stakes, for these Suffolk sheep are one of the breeds of folded sheep, as opposed to those which range freely. It is Suffolk's pride that alone of all the English counties it has its own breed of sheep, horses and cattle. The horses—Suffolk Punches—are beautiful beasts, with glossy chestnut coats, nice



clean legs and powerful necks. The cattle are deep russet-red and, like the Suffolk sheep, are hornless. They are called Red Polls because of their colour and because cattle without horns are known as polled cattle. I find the name misleading, since it is so easily confused with the red-poll which is a bird, and which is much more accurately named because it has a red poll, or head. In any event you are not likely to see many Red Polls or any other sort of cattle, for in these eastern counties grassland is scarce. The dry summers are not so good for grass as for grain and root crops, like sugar-beet.

You may also observe that there are few hedges—one field is separated from another, usually by a ditch to drain away the water of February fill-dyke, but the hedges have been cut down and grubbed up. There are good reasons for this. Since there are few animals on the land there is no profit in keeping up hedges to prevent them wandering. Secondly, the hedge grows by taking nourishment from the field on either side of it, nourishment which the farmer wants for his crops. Thirdly, it is more economical to plough one large field than two small ones—the tractor or horses have less turning and twisting to do—so that farmers take down hedges and run two fields into one. The result is that the country hereabouts is beginning to look a little bare and un-English, but appearances, you must remember, are not everything and there seems little doubt that the farmer is able to make his acres yield more without so many hedges.

Once you have passed Bury St Edmunds—where there is one of the world's biggest factories for making sugar from the sugar-beet—the county becomes a little more up and down, but is still given up principally to corn and sugar-beet, with here and there some acres of carrots and fruit trees. Not until you top the rise near Newmarket will you see grassland, and then not meadowland but carefully-tended gallops and paddocks for the racehorses which are bred and trained there. Beyond Newmarket to the north the land falls gently away, so that in the blue distance you can see the towers of Ely Cathedral standing like sentinels over fenlands flat as Holland. As you go to Cambridge and on to Huntingdon you skirt these rich fens, where dykes deep as rivers separate one huge flat field from another, and where the black soil yields heavy crops of corn, potatoes, sugar-beet, celery and, of course, tulips and other garden bulbs. The soil is far too rich to be used for pastures, so you will see very few cattle or sheep.

on fenland farms. Horses, of course, there will be, because the land must be ploughed and harrowed, and in winter is often so wet that it can only be worked by horses. Tractors would get bogged.

Between Huntingdon and Bedford the country continues flat and featureless. Worse, it begins to assume a sort of suburban air. You wonder at first why this is, and then, if your eyes have begun to open, you will notice that the farms show their stacks and their muck-heaps, their tillage and their animals, have given place to large vegetable gardens. This is one of England's market-gardening districts, where the soil is specially suited to growing the vegetables we eat—cabbages, lettuces, brussels sprouts, carrots and, queerly enough, parsley. Most of these are cut and rushed up to market in London, forty miles or so away; but the parsley, or the greater part of it, is sent up to Scotland, to Glasgow, where it is used in Scotch broth.

Soon after Bedford the scene changes completely. You are now in the Midlands of England, a rolling up-and-down country, a country of tall copses crowning the hills and high hawthorn hedges separating the fields. The soil is generally not so rich as that in the counties we have passed through, and, accordingly, as you would expect, there is more grass and less grain: and, of course, more grass means grazing, and that means more stock. Water is plentiful, so the farms, you may note, no longer huddle round the villages as they do in East Anglia. After Newport Pagnell and Stoney Stratford we have a choice of roads to the west, by Bicester and Oxford or by Towcester and Banbury; but either way the story will be much the same. In the valleys the meadows are rich but wet: on the hillsides the grass is poorer, and the hedges often so ill-disciplined that they break ranks and push a tangle of thorn bushes out into the meadows. The nature of the soil is told plainly by the towns of Fenny Stratford and Stoney Stratford—the one fenny or swampy, the other stony. Some of the meadows hereabouts are very large indeed. At the nearby village of Creslow there is one known as Creslow Great Ground which is vast—321 acres—the biggest meadow in Buckinghamshire and one of the biggest in England. It has a history too. It was bought by Queen Elizabeth to give to one of her servants because it had always grown such rich grass. It still does to-day, over 300 years later. Why



CRESLOW GREAT GROUND

should that particular 321 acres be so much richer than the land all round it? It is one of Nature's secrets which we have not yet learnt

This is a district where cattle are reared for meat, rather than milk, and in these midland pastures there will be a mixed lot, all shapes and colours, though chiefly, of course, of the breeds that make good beef. Some will be black and hornless—black polls. If you are close enough you will see that some have smooth, glossy coats and others crinkly coats and curly foreheads. This difference should enable you to distinguish two well-known Scottish breeds; the smooth ones are Aberdeen Angus, the curly ones are Galloways. Some cattle will be red with wide horns, white clown's faces, white socks and a white stripe down their backs. These are Herefords, a West of England breed which has become famous the world over, but particularly in the great meat-producing countries of the New World. It is most likely a Hereford that you eat as "bully" or canned beef



BULLOCKS GRAZING ON MIDLAND PASTURES

from the Argentine or U.S.A. You may perhaps spot some smaller, ruby-red beasts with horns, and these will be Devons, a county which has cattle as red as its soil. There will be lots of others, most of them cross-breeds—the hornless, blue-roan ones, for instance, being a cross between a black poll (Aberdeen or Galloway) and a white Shorthorn.

Sheep do not do well on wet land. It affects their hoofs and they suffer from an unpleasant disease called foot-rot, so you should only look for them roaming the hillsides. This tells you that they do not belong to one of the folded breeds. Most of those you see will have white faces, thick wool but no horns. These you can be fairly sure are what are known as Halfbreeds, that is a cross between two northern breeds, the Cheviot from Northumberland and the Border-Leicester. It is an interesting point to note that this particular cross alone is known as a Halfbred. All other crosses, whether of sheep or cattle, are called cross-breeds. Why that should be, I cannot tell you.

After you have passed Bicester, you come into Oxfordshire, another county



COTSWOLD HILLS

which boasts its own breed of sheep. The full name is the Oxford Down, and they can be picked out because they have the dark woolly faces and close wool which are the characteristics of these Down breeds. As you might guess, the name implies sheep which once thrived and were kept in enormous numbers on the downlands of Southern England. West of Oxford the grass pasture country speedily becomes drier, more hilly and less wooded, and in a few miles you are in fact in downland, though in name you are among the Cotswold Hills, a distinctive part of England with a light and colour all its own. The high round hills hump up into the sky, and below them in the valleys the stone villages and market towns sit securely. That should be enough to tell you that it is a dry country, for if there is water about it will be sure to collect in the valleys, and men do not put their dwellings in places which are wet or likely to be flooded. Yet the farmsteads are dotted here and there on the hills, which shows equally that deep in the limestone there is water to be tapped by wells, for, come to think of it, you cannot run a farm out of reach of water. Just think of the thirsts of the animals, not to mention the washing of such things as milking machines, and the sluicing out of cow-stalls and piggeries. In place of hedges there are rough stone walls. If asked why, you would probably reply, because there is plenty of stone hereabouts. That would be a correct answer, but the real reason is that farm hedges in England are almost always of thorn—hawthorn—and hawthorn is a shrub which will not grow on limestone soils. There are not many woods either, and such as there are, are not natural growths but spinneys and copses that have been planted for wind-breaks or to give cover for pheasants. The trees stand regimentally in close order, like the squares of Wellington's infantry at Waterloo. That may be in the tradition of the British Army but is not the way of the English wood. Our native trees do not huddle in craven coppices but advance with a sturdy individuality: first, a skirmishing fringe of bracken and then, either singly or in small bands, the main body of oak and ash and thorn and beech. But such freedom does not march well with modern

farming, and to-day our woodlands have to be trained and kept within strict bounds Besides bracken, like heather, is one of the farmer's many pests. He may banish it from his pastures but it will be sure to return.

To revert, there was a time when this Cotswold country gave pasture to thousands upon thousands of sheep, and, with East Anglia, was one of the great wool-growing districts of England Those prosperous-looking towns in the valleys were founded on the money brought in by wool Just west of Oxford is Witney, a name which is well known in connection with blankets. Here are still made the finest woollen blankets in Europe, but alas! the wool now comes from anywhere in the world but the Cotswolds Nowadays they support few sheep and fewer cattle It is a ploughland country, whose chief crop is barley, for which the high lands with their dry soil are well suited.

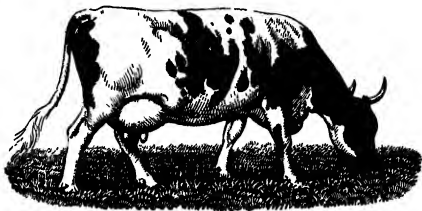
From the Cotswolds a choice of roads lies open to us—the one skirting the bare, military expanse of Salisbury Plain with its barbed wire and corrugated iron and plunging into the hilly, well-wooded grass and orchard county of Somerset; and the other striking west, by way of Gloucester, into the delectable principality of Wales. The former leads to a district where dairy-farming predominates The road winds, climbs and falls past sturdy farmsteads, whose grey, stone walls are gay with sprays of pink valerian and sponges of yellow stonecrop You will see fields of grain and roots, turnips, mangolds and swedes, but the emphasis is on the rich, well-kept grassland, which is the staple diet of the heavy cow population The cattle will all be of milk-producing breeds The large, square, horned beasts, red-roan or red and white, will be Dairy Shorthorns, one of the most famous and earliest—standardised of British breeds and developed originally in North Yorkshire and County Durham The white ones with brown markings and sharp, up-curving horns will be Ayrshires, which come, as the name indicates, from the south-west corner of Scotland Then there will be the two well-known Channel Islands breeds, Jerseys and Guernseys. These are much alike in shape, but dissimilar in colour



SOMERSET PASTURE

The Jerseys are brown or brindled brown and black with what are known as "mealy muzzles"—that is, their noses are black but look as if they had been dipped into a tub of meal: the Guernseys fawn, or fawn and white with pink muzzles. Both carry short horns, and have even larger and more mournful eyes than most cattle. Here, besides all the liquid milk that is sent away to the great cities, are made those noble English cheeses which take their name from the Vale of Cheddar; and here, the farm workers may still, if they are lucky, slake their dusty throats with cider, brewed from the little sour apples from the gnarled trees in the orchard, and matured in vast casks till it is dry and heady, and quite unlike the sweet, gaseous, bottled drink which is all too often accepted as cider by the town-dweller. The pity is that nowadays many of the orchards are overgrown and neglected, and the home-brewing of cider must regretfully be listed among the dying crafts of British husbandry.

If you turn sharply southwards you will find yourself among the high, round humps of the north Dorset Downs, whose shoulders, immemorially bare, are

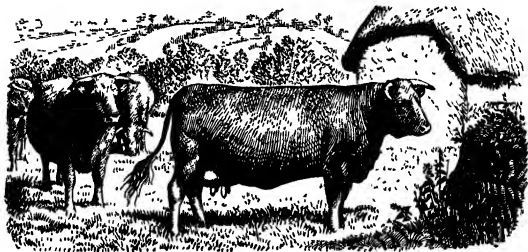


GRASS INTO MILK

now, alas, being draped with shaggy mantles of alien spruce and pine, but still afford grazing for sheep as they have done almost ever since the time when neolithic man pastured his flocks on them. If, on the other hand, you keep on your south-westerly course, your way will lead into Devon, one of England's most romanticised counties, famed alike in song and story and tourist guide-book, but not particularly noteworthy for its farming, in spite of its cream and its cider. It is a county of little fields, all hedge-enclosed, and growing, you might say, a bit of all sorts, turnips, swedes and beet, wheat and oats, but chiefly grass. Here is indeed a chequerboard where the green of the grassland is set off against the peculiar and almost rose-red of the ploughland, but it is not easy to see because road and lane run between high banks, deep in fern and foxglove, topped with walls of stone or turf, on which the gorse bristles and the wind-bent thorn bushes cling desperately to keep their roothold. Devon is one of the mixed-farming districts, one, that is, where the farmers do not specialise, but rear cattle both for meat and milk, pasture some sheep and till their land to grow arable crops.

A distinction is that Devon boasts two breeds of cattle; in the north the small, compact ruby-red animals which we have met already, and which are designed to yield meat, and in the south heavy, milk-producing beasts whose colour might be described as sandy or gingery-yellow, but which is quite distinctive. These South Devons rank with the Shorthorns as the largest of native British cattle.

By the northern route you will eventually come by way of mixed meat-and-milk country and the apple-orchards and hop gardens of Hereford into Wales, which, like Devon, is perhaps more beautiful than agriculturally important. It is a region of high hills and small sheep. The mountains of the north are fit only for the rearing of the hardy Welsh mountain sheep, and though farther south the landscape subsides into the flatness of the St David's peninsular, Welsh farming is mainly sheep-farming. Everything in Wales, except the hills, looks small. The folk are small, the clean white-washed steadings are small, and the patches of grain or roots on the hillsides are small. Small too are the Welsh cattle, black and horned, which are bred principally for meat.



SOUTH DEVON COWS



CHAPTER TWO

NORTH TO EDINBURGH

HAVING ventured by road so far with, I hope, some profit, let us make a second excursion, this time from south to north, by train from London to Edinburgh. The engine grunts and puffs its way in and out of the tunnels outside King's Cross Station, and, even when it has gathered speed and is swinging along on its 400-mile journey northwards, it will be half an hour before it has shaken off the clinging brick and concrete of London's northern suburbs, and you can look out on farming country around Hatfield in Hertfordshire.

This is a typical English mixed-farming district where the farmers both keep cows for milk and till their land to grow crops. The cows look very clean and tidy, the white ones with black markings are Friesians which came originally from Holland, the white ones with brown markings and slightly longer horns are Ayrshires, which we have met already. The country is all ups and downs, round-breasted hills and low valleys through which slow streams wind between pollarded willows, little, hedge-ringed meadows and fields of plough, trim copses and villages which look rather *too* spick and span. It is a sort of farming toyland, characteristic of England's Home Counties, but it soon flattens out into the wide stretch of market-garden country around Biggleswade which we passed through on our journey east to west. Suddenly there is a complete change. Across the flat, damp county runs a little ridge of sandy hills crowned by pines. This is one of Nature's freaks, which occur so often in the British Isles. If you are quick enough to read the name of the station through which your train thunders, you will see it is "Sandy", the folk who gave the names to our villages

and towns knew their business, you see. Naturally this sandy belt has its own special crops, carrots and onions, but in a minute or two it has passed and the country becomes quite flat. Indeed, between Huntingdon and Peterborough you skirt Fenland again, this time from the westward, and your view carries away over miles of the most valuable of our farming soils to the stockade of tall chimneys which mark the brickworks. These are less interested in the rich black soil than in the blue clay beneath it, the raw material of which bricks are made. In the deep clay pits are found fossilised remains of the huge beasts which roamed these swamps over 30 million years before Man thought of farming them, but which benefit the farmer of to-day, as we shall see.

A bare ten miles north of Peterborough and presto! the scene changes again, and you are in hilly country, cold country where grey-white walls again take the place of hedges. This is the tail end of the Lincolnshire Heath, and on the limestone soil grass comes into its own again. Although there are large islands of ploughland, grazing is the farmer's first interest. Lincoln has its own breed of cattle, the handsome Lincoln Reds, a deep red in colour with horns, but you are not likely to see many of them. The greater number of cattle in the fields will be Shorthorns, which have most likely been bred elsewhere and brought here to be fed and fattened. There is the same story to be told of sheep. Lincolnshire has its own breed of Lincoln Longwools, a big white sheep, but nowadays most of those you see will be Halfbreds—the cross between a Cheviot and a Border Leicester, remember—which is ousting so many of the old local breeds.

On roars the train, but though the country remains hilly until it has passed Grantham, it changes again. Hedges come back—that tells you the limestone belt has been left behind—and woods, but the most noticeable change, to my mind, in this Nottinghamshire country is the colour. The note is now a red one. There is far more ploughland, though you would best describe it as a mixed-farming district, and the soil is red. Red, too, are the brick farmsteads and villages which cluster round red churches. At Newark we cross the valley of the Trent, a wide green belt which is another of the sugar-beet growing areas. At Kelham there is a large factory which was one of the earliest to be built in Britain for making sugar from British-grown beets. You can see it on the left-hand side of the train as you pull out of Newark station.

If you are only interested in farming, you can close your eyes and take a rest soon after you have left Retford, for as you near Doncaster there will be little to see but engine-shops, factory chimneys, pit-shafts, soot-blackened trees and buildings of an ugly shade of blue bricks. You need not really open them again until you are clear of Knottingley and by then you will be in rural Yorkshire. The country is flat and, as you can see at once, the farming is arable. The soil on the ploughlands is dark and rich and grows heavy crops of barley and potatoes. Once Selby is passed you enter the wide plain of York, another of our rich farmlands. Your train will certainly stop at York, but when it has pulled out of the graceful curve of York station, it will run through flat, arable country for forty miles or so. This is the Vale of York which, as far as I know, is just about the longest stretch of farm country of one kind in the whole of England.



SOUTH-COUNTRY FARM AND FRIESIAN COWS

You have plenty of time to pick out the main details. The farms are large and well-scattered—water below, you will register—and of red brick. By and large it is arable land growing corn of all kinds, but chiefly barley, and some potatoes. Cattle and sheep used formerly to be reared for meat, being fed on swedes and turnips grown on the farms, but to-day much of the grassland has been ploughed and animals are few and far between.

There is so much sameness about this wide fertile plain that you may find your eyes wandering. If they do, look to the westward where in blues and purples are piled the hills of the Pennine chain, England's limestone backbone. In the folds of these high hills lie deep, well-watered valleys where practically the only crop is grass—we will come to that later. Shortly after you have passed the red-brick town of Northallerton, into the pens of whose cattle-market you can look down from your seat, one of these dales, Teesdale, crosses the line. This is a famous piece of farming England, for in Teesdale at the village of Ketton in 1780, two brothers, Charles and Robert Collings, began the breed of cattle known the world over as the Shorthorn, which I have already mentioned and about which I shall tell you later on. Teesdale is mainly a grassland district where the farmers are still proud to keep up the high tradition of their pioneer forefathers; but the train soon runs into arable country again. The interesting thing about Durham, which you can see for yourself, is that though it is a county of coal-mines and factories, smoke and soot, towns and trams, it is also a well-farmed one. Farming flourishes among the factories. Indeed, this is one of the leading potato-growing districts of Britain, its large population of pit and factory workers helping first to grow and harvest them, and then to eat them. At Durham itself the lovely Norman cathedral is a reminder that the great cathedrals of England are mainly to be found in good farming districts where

in the old days good money was made—Salisbury, Winchester, Lincoln, Wells, Peterborough, and Norwich, to name a few

Just out of Durham you may catch sight of a black, Greek-temple-like building on a hilltop. This is the Penshaw monument. The story goes that years ago an Earl of Durham reduced his tenants' rents in a time when farming was bad, in gratitude for which they began to build a memorial to him. "Ah!" said the Earl, "if you've all got money to waste on a thing like that, you can afford to pay your rents!" And up he put them again. The result was that the memorial was never finished. You may notice it has no roof.

The tale is mostly one of coal and grime to Newcastle, but beyond, through Northumberland and over the Scottish border as far as Dunbar, there are fertile ploughlands to the east or seaward, and grassland in the hills to the west. The



CHEVIOT SHEEP ON THEIR NATIVE HILLS

trouble indeed is that because the men who planned the railway naturally picked the flattest route, most of our journey has been through different types of arable country. Generally speaking, the hilly districts lie off to the west, but from Newcastle onwards the hills gradually close in, first the Cheviots and then the Lammermoors, until only a narrow strip of ploughland is left between them and the sheer cliffs that front the North Sea. At first the gap is many miles wide and you may not recognise the ploughland as such because it will be growing grass. This is grass sown as a crop in what are called "leys"—about which we shall talk later—and on these temporary pastures are fattened cattle (most of them cross-breds) which are sent to Edinburgh to be killed. They then come—or used to do before the days of controls—back to Smithfield Market in London where they are sold as Scotch beef. Something like the Bedfordshire parsley which goes to Glasgow!

To the west roll the Cheviots, whose steep grass-clad slopes are so many thousands of acres of pasture for sheep, which are free from birth to the butcher

to roam where they wish. The breed which takes its name from these hills is white-faced with prick ears and close, firm wool. The Border Leicester is not unlike it, but is slightly bigger, has longer wool and a distinctly Roman nose. It is the cross between these two which gives the famous Halfbred, which is popular throughout the grassland districts of Britain because it is a grass-eater which has large families and because the ewes are excellent mothers to their lambs. A few miles from the line to the west, Tankerville Park stands on the Chillingham range of hills, an offshoot of the Cheviots. Here is kept the Chillingham herd of wild British cattle, lineal descendants, probably, of the beasts which roamed the forests of Europe two thousand years ago. They are pure white with black muzzles and long horns, but are small and rather scraggy by comparison with the carefully bred beef or milk cattle of the modern farm. There is no doubt about their wildness, as you would soon find if you started to walk across the Park, but curiously enough they would not come at you if you went on horseback, or even in a cart.

As your train drums along towards Berwick-on-Tweed you notice the hills begin to recede until the land becomes almost flat to where the slow-running River Till joins the faster, shallower, sparkling Tweed. Once over the Tweed you are in Scotland and soon into East Lothian, in what many good judges believe to be the best-farmed district in the British Isles, an arable district yielding corn and potatoes. That it is well-farmed you can, or you should by now, recognise for yourself. The fields are so well tilled, so clean and weed-free, so well-drained, not a yard is wasted. You may see a field ploughed right up to an inch, it seems, from the edge of the cliffs which fall to the rocky shore, the sea-gulls mcwing as they march along in the furrows behind the plough. The farms are large, with fine stone farmhouses and buildings and usually a row of stone cottages for the farmhands which make each farm almost a village in itself.

You *may* still see some of the women working in the fields wearing the old-fashioned "bondagers" dress; grey, home-knitted stockings, strong boots, short, full-pleated skirts of Hodden grey, grey blouse and large, wide-brimmed hat held on by a pink 'kerchief covering much of the wearer's face and tied under the chin. If you do you will be lucky, for this picturesque relic from the costumes of a bygone day is fast disappearing as machinery replaces hand labour. It is not so very many years ago that many of the farming districts of Britain were proud of their distinctive dress. No more than fifty years ago you could anywhere tell a "farmer's boy" from a factory worker as easily as from a soldier. Each of these callings had its uniform. Now all are just rather grubby-looking people, clad alike in dungarees and armed with spanners!

The Berwickshire hills keep your train crowded almost up to the cliffs' edge, and at Burnmouth and Cockburnspath you can get a peep down to the sea-shore. The names of these villages tell of the swift streams which you can see leaping and tumbling down the hillsides to the sea. The arable belt is so narrow that the farms are smaller and the workers almost as much fisherfolk as farmers. Again the scene changes, and at Dunbar the train swings westward towards Edinburgh, the land flattens out and the area between hills and sea becomes wider and wider. It is a dry and sheltered district whose soil is a beautiful red



TWEEDSIDE PLOUGHING

colour which seems to proclaim how rich it is. Not surprisingly, therefore, you will notice a return to market-gardening, like that around Biggleswade, except that the crops here have a Scottish accent, as you might say. One of the most important is leeks, one kind of which is named after the nearby town of Musselburgh. That favourite Scotch broth, cockieleckie, shows to what use the local leeks and the Bedfordshire parsley are put.

At long last the engine's whistle warns you to take your last look at the countryside. The train begins to clatter past the old grey stone and modern red-brick suburbs of Edinburgh until with a sudden dive it plunges into the gloomy cutting which runs under the frown of the Castle rock into Waverley Station. You have come through over 400 miles of farming country in England and Scotland.

Now we took those two journeys on paper so that I could show you how the farming face of Britain changes every few miles. What else have you learnt? Well, you have seen that arable land is land that the farmer ploughs and sows with crops such as corn, turnips, sugar-beet or potatoes, and you should have learnt the chief kinds of grain—wheat, oats and barley—and how to know one from the other. You have seen how some soil is good for arable crops and other land is "left down to grass"—to use farming language—and that grass may be sown and grown as a crop called a ley. I have mentioned that even permanent grassland can vary greatly in quality—some fields grow first-class forage which will by itself fatten beasts for the butcher or enable the dairy cow to give four gallons of milk a day; while others are so poor and rough that they are fit only for grazing by the breeds of sheep which subsist on the most meagre of diets. You should have learnt that sheep are not just sheep, but are of many breeds as separate and distinct as is a Chinese from a Hottentot, and that some find their own food on the slopes of hill or mountain, while others are penned or folded

on crops specially grown for them. You should know, too, how to identify certain breeds of cattle—Friesians horned with black and white markings, Guerneys fawn and white, and Aberdeen Angus glossy and black with no horns—and have seen that some breeds have been developed to make meat and others milk. You should have begun at least to size up the countryside at a glance—to know that it is well watered by the farms being dotted here and there and not clustering round the villages as they would if the district were dry, that the soil is on the limestone by the presence of walls instead of hedges, that the farming is either arable or grassland, and if the latter, whether it is dairying or stock-raising.

Have you begun to ask yourself how it is that there are these wide differences in the character of the soil, and therefore in the amount and quality of the food it will grow for man and beast? If you have, the answer to your query will cover the whole science and practice of farming. So, if, having travelled thus far afield, you are interested to learn more, I will try and give you the answer as shortly and clearly as I can. But that will need two chapters, for it is a complicated story.





CHAPTER THREE

THE NATURE OF SOIL

THE foundation of farming is fertility. The farmer's task is to ensure that each type of soil yields the highest amount of food for Man and Beast, and yet keep his land fertile—that is, in “good heart.” He will take from the soil the most that it will give, but unless he puts back what he takes out, his land will lose heart, and begin to give smaller and smaller crops, until eventually it may become exhausted. The soil may be likened to the battery of a motor-car. This is continually giving out power to work the headlights, the self-starter and the horn. So long as the car is in good order this power is replaced all the time the engine is running, but if the car is neglected, the mechanism is likely to become faulty and power ceases to be put back into the battery. The result, as most people know, is that the battery will go on working until one day all its stored power is used up and it will function no longer.

Fertility depends on two main factors—first, the kind of natural soil the farmer has to cultivate, and, secondly, the skill and care with which he keeps it in good heart. On our two journeys I tried to show you how the kind of farming changes with the soil, and you should appreciate that these soil changes are only the outward and visible signs of changes in the rocks which lie deep below and form the skeleton of Britain. On our first journey we started off in Suffolk, below the ploughland of which is sandstone. Below the grassy slopes of Newmarket lies the chalk. The North Buckinghamshire country rests on what is known as Oxford and Boulder clay, while the valley of the Ouse is on alluvial gravel. At Huntingdon, and again at Bicester, we touched the limestone which rose higher and higher till we reached the Cotswolds. Then we dropped suddenly

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Headpiece. Berkshire Downs Lynchets

Chillingham Cattle

to the red sandstone valley of the Severn. It is the red sandstone which, coming to the surface in Devon, is responsible for "Red Devon by the sea."

On our train journey to the North we started off on the London clay, and climbed over the chalk hills of North London before coming down to the gravels and clays of Hertfordshire. The odd freak of Sandy rests on a ridge of greensand. There is limestone in Lincolnshire, sandstone again around Newark and Retford and coal at Doncaster. The wide plain of York has limestone and sandstone below the rich covering soil laid over it by the rivers, which run through the dales and come together to form the Yorkshire Ouse. Below Northumberland there is whinstone, which a million years ago was pushed up by volcanic pressure through the limestone layers above it. The old red sandstone below the market-gardens of Dunbar has also been broken by volcanic rocks, a good example of



NORTHUMBERLAND WHINSTONE

which is the castle rock at Edinburgh in whose shadow our train journey ended I list these geological details to emphasise that it is the rock underneath which decides the type of natural soil the farmer has to cultivate, and thus influences the kind of farming he is able to practise.

The soil is the fertile earth which forms the top crust. In some places it is very thin. In Derbyshire, where the limestone thrusts through the short grass, you can see in the great quarries that there is no more than an inch or two of dark earth covering the grey mass of solid limestone, like chocolate icing on a cake. In other parts it goes deep, down to several feet, especially, as we saw, in the Fenlands and the plain of York.

Whether the natural soil is thin or deep, its degree of fertility will be decided by the steps the farmer takes to keep the battery charged. The earliest farmers were no more than nomadic herdsmen of cattle and sheep which roamed the plains, forests and swamps thousands of years before ever history began to be

recorded, much less written. The peculiarity of agriculture in Britain is that the first farmers in the country seem already to have passed this nomadic state and to have reached a rudimentary stage of mixed farming, cultivating patches of wheat and barley as well as keeping cattle and sheep. That is to say, they had already made the discovery that though plants like wheat or oats might flourish in a state of Nature, they would not continue to do so if regularly plucked. They had learnt that they must grow their own grain on land they had prepared to receive it. We can picture them with primitive instruments of wood, or wood and stone, or deer-antlers, scuffling a patch of land round their huts and sowing it with the seeds of wild oats. You can see traces of these ancient strips of cultivated land as rough steps or terraces on the slopes of the Berkshire Downs. They are called lynchets, and the old folk who made them already knew enough to carry up rich soil from the valleys to give heart to the poor chalk soil of the hills on which their settlements were placed.

Then, though far, far more slowly, came Man's second great discovery—that the same plot of land, no matter how rich to begin with, will not continue to produce crops indefinitely. In time it will become tired, the battery will run down and the soil lose heart. Fertility will decline. "To-day the lion and the lizard keep their court where Jamshyd gloried and drank deep", and the jackal howls on the sand that drifts and eddies over the cities and civilisations of the past. What all too few people realise is that one cause of the decline of the great empires of antiquity, of Assyria and Babylon in the East and the Mayas in the West, is that they forgot or neglected the golden rule. As their populations increased and their cities grew in size and splendour, they plundered their land for more and more food. They went on cropping and cropping until there was no heart left in it, and at last it rose up in sand to engulf them. The same folly has been perpetrated in their ignorance by the savage tribes of Africa, and in their recklessness by the farmers in parts of the U.S.A., who have in a period measured only in tens of years converted wide tracts of fertile soil into deserts which they have appropriately christened "Dust Bowls."

At the other end of the scale are the Chinese, the "farmers of forty centuries." They have only been able to support their teeming population on the same land for these 4,000 years by the most patient and economical methods of replenishing it. The result is that to-day it remains fertile, if not in what a British farmer would regard as "good heart." Certainly it is neither worked out nor in danger of blowing away.

Generally speaking, Man has gradually, over tens of thousands of years, come to recognise that, like himself and his animals, the soil on which their lives depend needs itself to be fed and nourished. On this recognition rests, as I have said, the whole complicated business of modern farming, or Agriculture.

Nowhere in the world is the truth more clearly recognised or faithfully followed than in Britain. This is an old country. Most of its farmlands have been under cultivation of some sort for 4,500 years, yet they are mainly in as good heart to-day as they were when our ancient forefathers first began to till them. You need only come back to Britain after a journey abroad to be struck at once by the well-tended, trim and comfortable appearance of the countryside.

This is no accident, but the result of centuries of that affectionate care for his land which is the tradition of the British farmer. The best of our farmers, and they are many, have always striven not only to put back into the land what they took from it, but to leave their holding in better heart than when they entered into it.

There is a fascination in speculating just how it was that Ancient Man first stumbled on this truth. There is a fascination also in the history of Man's long quest for the best ways and means to keep his land fertile. This is a story in which we can take particular pride, since the great agricultural pioneers have nearly all been farmers and scientists of Britain. In showing how to use the soil, as in developing the best breeds of cattle, horses, sheep and pigs, Britain has led the world. But if at this point we turn aside to inquire how or why our present knowledge has been arrived at, there will be a risk of losing the thread of the story, so that it will be better to omit historical fact and fancies, and concentrate on the problem as it is seen to-day.

What exactly is this substance called soil? We have seen in our two journeys that it varies with the rocks underneath, and this gives the clue that it is fundamentally made from these rocks, that is to say, it is composed of minute particles of grit, which has been broken from the rocks by the grinding of prehistoric glaciers and the action of wind, frost and water down the centuries. Though these gritty particles may be called the basic raw material of the soil, they are only one of its many components. To begin with, they are surrounded by air and by water, and the more there is of the one, the less there is of the other. This is important to note because much of the work that the farmer does to the soil with ploughs and harrows and rollers is to strike the right balance of water and air in it.

Mixed up with the grit and the air and the water are the remains of roots and leaves of crops which have been grown and harvested, other crops which have been grown specially to be ploughed-under while green, or some plants which have just withered and died. Each spring the plant grows. In late summer or autumn it dies and rots back into the soil, and this death and decay is one of Nature's main provisions to enable the land to carry the new growth of the next year. As the roots or plants decay they turn black or dark brown, and eventually rot completely until if you can separate them from the mass of grit, air and water—a very difficult thing to do—they look like brown peat or a brown soft jelly. They have now become what is known as humus. Humus is a most important constituent of the soil: in one sense it is the heart of the soil. For example, if the soil is coarse, that is if the gritty particles are large like sand, then the jellified humus not only helps to bind the particles together into a consistent whole, but swells with the water so that the growing plant has first a firm bed, and second, can find food and drink in times of drought. If, on the other hand, the particles are microscopically small, they tend to cling together in a soapy mass which you know as clay, and which is so tight-packed that it will not allow sufficient water and air to pass through to the plant. The peaty sort of humus breaks down the mass so that it will, as the farmer would say, "work" more easily with hoe or plough or harrow. Even if the contrary happens,

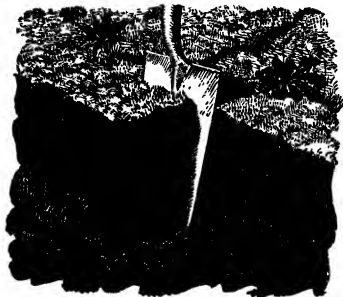


and the jellified humus mixes with the clay, the result will be much the same. It will absorb the water, expand to allow the entry of air, and thus achieve the desired balance in the end. Humus is always dark in colour, and soil which has a high humus content will therefore be darker than others. You can see this clearly in the black soils of the fens and of old, well-manured gardens. The curious thing is that the darker the soil the warmer it is, so that humus has an influence on providing the right soil temperature to encourage the plant to grow. Lastly, humus is all important because of the plant food it provides itself, and for the plant-food it absorbs and holds ready for the roots of the plant to reach out for and use.

Nor is the soil just dead grit, air, water and rotten vegetation. If you were to look into it with a very powerful microscope it would appear as a jungle of different forms of animal and plant life. The animals are protozoa and the plants bacteria, and both are important since in their struggle for existence they bring about changes in the plant foods in the soil. They have the sovereign power of attracting nitrogen—I will come to that later—from the air and thus of increasing fertility by fixing it in a form in which it can be used by the plant.

We can now top up the ingredients of the soil as grit in particles of varying size, air and water, humus, which acts as leaven on the lump, and the microscopic bugs and plants. There remain what we can call the direct plant foods. These are mineral salts. All are essential to fertility, but whereas most of them need be present in the soil in minute quantities, four of them—calcium, potash, phosphate and nitrogen—are necessary in amounts ranging from hundredweights to tons per acre.

I have already used the word plant-food more than once, but before we inquire



THE DARK BAND OF TOP-SOIL OR HUMUS

into what it means, we ought to be sure we know how plants feed and are nourished. Like man and the animals, plants need air and sun, water and food. They breathe in the air and absorb sunlight and moisture through their leaves. They also feed and drink through their roots, which sometimes—wheat is particularly deep-rooted—reach down farther below ground than the height of the plant above it, five feet or more. That moisture is taken up through the roots can easily be seen by watching how quickly a pot-plant will wilt if it is not watered. There must not be too much moisture in the soil—or too little humus—or the mass will bind, there will be insufficient air and the roots may rot. There must not be too much air or the soil will be loose and dry, and the plant will wither and may be blown away. I have seen half a field of sugar-beet in the light, sandy part of South Norfolk blown by a high wind clean out of the ground and piled up along the hedge.

The actual food taken by the plant is a more complicated matter. First, there are the mineral salts. Many of these are found in all soils, though in such tiny quantities that they are often known as trace elements (because there is no more than a trace of them). They include zinc, iron, copper, cobalt, manganese, boron, molybdenum and many others. The least bit too much of these salts may upset the balance of fertility, with disastrous results. For example, in Somerset there were until a few years ago hundreds of acres of rich pasture land which could not be used. The dairy cattle which were put to graze on these teart pastures, as they are called, were afflicted with such violent diarrhoea that they soon began to waste and had to be taken off. Then science came to the aid of the perplexed farmers and made a thorough examination of samples of soil from the teart pastures. It was found that these all contained too much molybdenum. Having discovered the cause, remedy was easy. Farmers were advised to add a small dose of copper to the cows' daily diet. This corrected the effects of the molybdenum and restored to the use of Somerset farmers many acres of rich grazing land. I mention this to show the importance of these trace elements.

Finally, there are the four elements, calcium, potash, phosphates and nitrogen, without which in sufficient quantities the land will not keep in good enough heart to yield satisfactory crops. Soils which rest on a bed of limestone, or which are chalky in nature, usually contain enough calcium, but others are very short of it. Without it the bacteria will not work and that means that nitrogen will not be provided in a form which the plant can take up. The same sort of story is true of potash—many kinds of soil have it in plenty, particularly the clayey ones, while sandy and chalky soils contain very little. On the other hand, phosphates, or phosphorus, are short in most soils, although as necessary to fertility as calcium or potash. In those districts where there is a good proportion of phosphates, its presence is explained by a theory which may sound fantastic. These were once swamps where the giant lizards of the prehistoric ages roamed unchallenged for a period measured by hundreds of thousands of years. These beasts were huge, measuring up to 100 feet in length and weighing many tons. Their droppings were correspondingly enormous. Over the millions of years that separate our world to-day from that dim and distant age these droppings have become petrified, forming big balls of stone known as coprolites. They are



PREHISTORIC BEASTS

constantly disintegrating or being broken down, and as they break up they release phosphorus which the soil takes up and makes available as a plant food. That may sound almost unbelievable, but I assure you that it is a serious theory, and probably the most satisfactory explanation of how phosphates come to be present in certain soils in relatively large quantities

And so we come at last to nitrogen, a word which has cropped up more than once already. The truth is that it is impossible to discuss fertility without mentioning nitrogen, because nitrogen is the most important of all plant foods. Without sufficient nitrogen crops will not *grow*—no matter how rich and well-balanced the land may be in all its other ingredients. It is nitrogen that stimulates growth, and it is curious therefore that it is less a normal constituent of the soil than are calcium, potash or phosphates. But nitrogen exists in some form everywhere in Nature and especially in the atmosphere. The air we breathe and which surrounds our world is no less than 80 per cent composed of nitrogen. Consequently some reaches the earth through rain-water and snow.

Farmers have an old saying that "a fall of snow is as good as a load of muck," meaning that it adds to the fertility of their land like animal manure, but this is more of an old wives' tale than an expression of scientific truth. There is no more nitrogen in snow than in rain-water. There is nitrogen, of course, in farm-yard muck. That there is nitrogen in the soil is due, as I have already mentioned, to the bacteria and the action of certain forms of plants. The interesting thing is that while one set of bacteria are helping the soil to store up nitrogen, another set are making it easier to be washed away by rain and drainage water. This loss of nitrogen is called "leaching," and explains why in very wet seasons crops are unusually poor, due to the scarcity of nitrogen, whereas in a hot, sunny summer the gain in nitrogen will be shown in a rich harvest.

The bacteria and the plant in fact work together to make nitrogen naturally available. The most active plants belong to the pea and clover families. One of the wonders of life on the farm is the bargain that the bacteria have struck with

these plants, providing that in exchange for food which the plant produces as it grows, the bacteria collect nitrogen from the air, hold it and convert it into a form which the plant can use at once as food for itself. Fortunately, bacteria are industrious, and manufacture far more nitrate than their partners, the peas and the clovers, can assimilate, so that much is left over for use by other kinds of crops.

The soil gets nitrogen also as a result of what is known as the nitrogen cycle. As the animal—cow, horse or sheep—eats the plant, it takes in the nitrogen the plant contains. In due course this nitrogen passes through the animal as dung or urine, and is eventually absorbed into the soil to give nourishment for the next season's growth. In virgin countries the soil in the course of thousands of years stores up vast reserves of nitrogen by the revolutions of this cycle. It is only when Man, with his steadily growing numbers and increasing demands on the soil, starts to make inroads on these accumulated stores by cropping, cropping, cropping without restoring any nitrogen to the soil, that the land becomes impoverished and the battery runs down.

Which brings us back to where we began. The soil is grit, plus air and water, plus humus, plus bugs, beneficial and otherwise, plus the trace elements, plus calcium, potash, phosphates and nitrogen. Though all are essential you can with some accuracy say that the most important are humus and nitrogen, because it is on them that fertility rests more directly than the others.



CHAPTER FOUR

KEEPING LAND IN GOOD HEART

IF you wonder why I have gone into the composition of the soil in such detail, the answer is that unless we understand this we cannot fully appreciate the reasons why the farmer carries out some of the simplest day-to-day operations. Let us now see what are the steps he can and does take to ensure that his land is in good heart.

First, there is the basic matter of grit. This will be determined by the nature of the rocks which lie beneath the area in which his farm is sited, so obviously he can do little to change it. As a general rule he is content to work whatever sort of soil, sandy or clay, chalky or limestone, heavy or light, exists on his holding.

Second, air and water—and here, as I have said, he has much to do. Indeed, the provision of the right balance of air and water is one of the main reasons for all the ploughing, harrowing and rolling that goes on. These are, of course, done directly with the object of preparing the soil to receive the seeds at sowing time, and to remove the weeds and tighten up the seed-bed as the crop is growing. But ploughing turns over the soil and so lets in the air. It also forms a series of ridges and valleys which enable the water to drain off in autumn and winter, as well as turning underground all the stubble, weeds and other plants which are growing on the land. Harrowing serves to break up the crusty surface of the ground and let in the air as well as to pull up unwanted weeds. Rolling binds the soil, and has the effect—depending upon the nature of the soil and the type of weather—either of bringing the moisture to the surface and thus getting rid of it; or of keeping it in the soil.



STIRRING THE SOIL—THREE FURROW TRACTOR PLOUGH

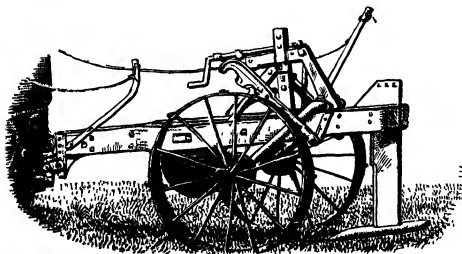
Strong hedges, especially those which harbour fully-grown trees, also tend to draw moisture from the soil as well as nourishment; and, as we have already noted, the trend is for the farmer to root them up, especially in districts where they are no longer needed for enclosing stock. This helps to let in light and sun, and to allow the wind to play its part in drying the surface of the soil. There is, of course, the danger that by taking away the hedge you remove a break for the wind, so that there may be nothing to stop a gale from flattening a crop, or even blowing it out of the ground altogether.

In wet districts, or in times of heavy rain and flood the farmer must spend much time and money in draining his land. It may surprise you to know that this quiet English meadow, or that field of rustling corn, has beneath it more yards of drainpipes than a suburban housing estate. The fact is that the greater part of our farms are expensively and extensively drained. You can tell at a glance from the window of a motor-car or railway train whether land is of the sort which must be drained or not. If the fields are small and have ditches round them you may be sure that the land is wet, and that they will be drained below the surface as well as by the ditches round the sides. If the fields are large and there are no ditches it means the land is light and that the subsoil—the rocks beneath—will allow water to filter through it. The farmer must see that the main drainage ditches round his fields are well dug, and cleaned each spring, cutting back the hedges and clearing the ditch of all the silt, leaves and rubbish that have fallen into it during the year.

If his fields do not drain naturally into the ditches they will become waterlogged in bad weather and that will make them sour and infertile. These fields he drains by digging narrow trenches gently sloping toward the ditches, and in them lays rough pot drainpipes, just touching one another, end to end. He does not join them up with mortar or cement, but leaves a very narrow gap between each so that the water seeping down from the surface can enter the drain

all along its length You are certain in your journeys through the country to see men either digging the drainage trenches—you will notice they use a long, narrow spade specially designed for the job—or laying the pipes. You may also see mole-draining being carried out As you might expect, mole-draining is just making a drain like a mole does by driving a tunnel through the earth It is done by a sort of plough, drawn usually by a tractor, which instead of the usual plough-share to turn over the soil, has a deep blade, the end of which is shaped like a thin cigar This is the "mole" The blade sinks the "mole" about two feet beneath the surface and as the tractor draws it along it makes a neat tunnel Mole-draining is much quicker to do than tile-draining, but it is not suitable for flat lands As the "mole" is set at a fixed distance below ground, the drain cannot itself fall away to the ditch, so that the mole-drain must always be drawn in the opposite direction to the land fall, starting at the ditch and working uphill So much for grit, light and sun, air and water

The next item is humus, and this is one with which the farmer has every concern. As we have seen, humus comes from decaying organic matter, the rotting down of products of plant or animal life, and the importance of humus is now so well recognised that farmers are careful not to waste any vegetable or animal products or residues which can form the raw material from which humus is made. First, there are the left-overs of last season's crops, which are ploughed back into the soil in autumn Next there are crops specially grown to be ploughed in while they are green and of which the commonest is mustard. As you travel the countryside in summer or autumn, your eyes may notice a crop which at first you cannot identify—a field of rich, darkish green plants, with serrated leaves and pale yellow flowers, standing about a foot or eighteen inches high This is mustard, and though some is, of course, grown to give us the contents of our mustard-pots, much more is sown because it grows very quickly, and if ploughed into the soil while in full, green leaf, is an excellent raw material to rot down for humus



MOLE DRAINER WITH THE "MOLE" LIFTED ABOVE GROUND

Every one knows that manure, or "muck," is the farmer's stand-by. Muck is not only important as a provider of humus, but also a fine breeding-ground for the necessary bacteria, and the vehicle which carries the mineral salts from the animal back to the soil. For centuries muck was almost the only thing that was generally added to the land to keep it in good heart. The farmer can rely on a regular supply of muck from the cleaning out of his cow-sheds, his stables and his pig-styes, but these sources will seldom give him nearly enough. To get more he mainly relies on keeping young cattle in stock-yards or on sheep folded on his land. The young cattle, bullocks or heifers aged from ten months or so, are kept and fed all winter and most of spring and summer in yards, some of which are covered and some open to the sky. Beneath them are piled large



HAMPSHIRE DOWN SHEEP FOLDED ON ROOTS

quantities of straw. As soon as this is properly trodden down and saturated with dung and urine, more straw is put in, and more and more. The floor of the yard is thus raised higher and higher until the beasts are looking down at you as from a platform, and the farmer may have to add a bar above the level of the yard gate to keep them from tumbling out. Then in autumn the yard is cleared of tons and tons of rich, tightly-trodden muck which is carted out and spread on field or meadow ready to be ploughed in to make humus, to increase the bacteria and to enrich the soil with mineral salts.

The folding of sheep is a more direct method of applying muck to the land, but is mainly limited to the arable districts of Britain, especially the Downlands, the Cotswolds and the Eastern Counties. A flock of sheep—chiefly the close-woolled breeds like the black-faced Suffolks or Southdowns or Hampshire Downs—are folded in movable pens made of hurdles or wire and stakes on half an acre



or less of roots, or cabbages, or sugar-beet tops left after the beets have been harvested, or clover. They are stupid animals and must not be given too large an area to eat off, because they will go on stuffing themselves with juicy green foods which develop so much gas inside them that it may literally burst their stomachs. Also, careful folding means less waste from the treading down of the standing crop and from infestation by worms, which are one of the major afflictions of sheep of all breeds. The shepherd has therefore to gauge just how much food they will need, and moves them from one patch to the next as soon as the first one has been eaten bare. And how bare! A field after sheep have been folded on it is as bare as if a host of locusts had passed—not a blade of grass is left (the only thing that defeats the greedy sheep seems to be the hard stalks of the cabbages)—while, if the weather is wet, the ground looks as though an army had fought over it. Yet what appears as destruction is valuable fertilisation. The sheep feed themselves and manure the soil at the same time, and their sharp, mining hooves cut up the land and tread the muck into it. The value of this method of fertilisation has for hundreds of years been so clearly recognised that it is known as the "Golden Hoof"—the treading which enriches the soil and thus enables it to grow profitable crops.

As a historical flashback it is interesting to note that manuring by folded animals was practised even in Saxon England. Cattle, as well as sheep, were folded on selected fields at night, and herdsmen kept them moving about so that their droppings were evenly distributed.

Naturally the farmer hopes to profit by selling the cattle he has fattened in his yards, and the lambs from the sheep he folds on his land, yet both are often considerations secondary to the all-important job of making muck. Farmers who do not keep muck stock, or market-gardeners who usually keep none and yet need more humus and plant food per acre than the farmer (some intensively cultivated gardens use as much as 50 tons an acre), must find other organic products in place of muck. Anything which has once been part of a living animal or plant will do—bones, hoof and horn, shoddy, the waste products from butchers' and fishmongers' shops or the domestic kitchen, to name a few. Shoddy, by the way, is the ends of wool left by the woollen mills as too short to weave. These are all animal products, but vegetable products rotted down and made into what is called compost are almost as effective. All help to give the same kind of body to the soil as farmyard manure.

Whether the farmer uses muck, one of the animal products, or compost, he adds to the humus in his land and therefore builds up a happy home for the bacteria; and, as Kipling might have said, "You must particularly remember the bacteria, oh best beloved!" Unseen and usually unhonoured, they work hard to make a fertile farm, but they must have humus.

There remain the mineral salts—the trace elements, and the four major plant foods. What can the farmer do about these? As I have said, he takes out an insurance that his land is given some of them by manuring it. Muck and the other organic products contain many of the trace elements, besides some calcium, potash, phosphates and nitrogen, product of the nitrogen cycle. But this is a hit-or-miss method of applying them. To-day, as you will have noted from the

example of the Somerset teart pastures, the scientist can take a sample of any soil and tell the farmer with great accuracy what it does and what it does not contain. The go-ahead farmer, therefore, is likely to have his soil analysed before he takes action. It is not often that he will have to do much about the trace elements, though in Scotland he may have to correct a deficiency in boron, which causes an unpleasant disease in turnips, called raan.

A simple test will show whether the land needs calcium. The farmer has only to put a pinch or two of soil in a dish or saucer and pour a few drops of a greeny-blue dyestuff over it. If there is a calcium deficiency, the dye will turn yellow, the more definite the change of colour the bigger being the deficiency. If this happens the farmer must give the field in question a good dressing with lime, possibly up to several tons to the acre. The dyestuff used in this test, by the way, may be either brom-thymol-blue and methyl red, or bromo-cresol-purple. So now you know!

A shortage of potash can also be detected by scientific means, though the test is more elaborate. Part of any deficiency that may be disclosed may be made up by adding more and more farmyard manure, but this is neither always practicable or satisfactory. Nowadays potash is imported into Britain from natural sources in France, Germany, Spain, U S A and Palestine, and the more efficient method is for the farmer to buy this in bags and put on the precise amount necessary to bring the potash content of his land to the fertility level. The same applies to phosphates. In olden days farmers had to rely on muck to supply it, or else use bone manure, treated with sulphuric acid, or the prehistoric coprolites ground down and similarly treated. To-day it is far simpler and more efficient to buy bags of phosphates made from the rich deposits of phosphate rock found principally in North Africa.

Practically the whole of Britain, except that fortunate district, the Fens, is short of natural nitrogen. As nitrogen has a greater influence on growth than any other plant food, it follows that the provision of enough nitrogen for their land is a priority job for almost all farmers. They can, as we have seen, encourage Nature to produce it by stimulating the bacteria and by growing crops like peas and clovers—and even the familiar lupins sometimes—which will collect and store nitrogen in their roots. They add small quantities to the soil each time they apply farmyard manure. But both methods together will not necessarily give anything like enough nitrogen to produce a thoroughly efficient standard of productivity. It has therefore long been the practice for the farmer to buy large quantities of nitrogen in bags, as he does the three other plant foods.

This bagged nitrogen came originally either from the huge natural nitrate deposits of Chile or from British coal as a by-product of industrial processes. As coal is the compressed product of vegetation which flourished millions of years ago, it contains the nitrogen stored by the plants of which it is composed. The problem was to release this, and it was soon found that this was done in the normal course of making coal gas and in the manufacture of steel, both of which gave nitrogen in the form of crystals of sulphate of ammonia.

Naturally, there was a limit to both these sources of supply, foreign and domestic. The Chilean mines were not inexhaustible, and, besides, were at the



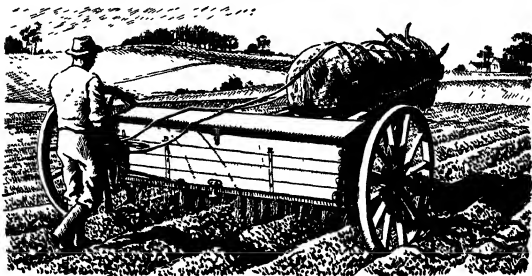
SUFFOLK SHEEP

other end of the earth. The amount of sulphate of ammonia from the gas-works and the coke-ovens was strictly regulated by the quantities of gas and steel which were being produced. As farmers in all civilised countries began to awaken to the value of nitrogen, it was soon evident that the demand would one day outrun all the known sources of supply, and in 1898 a great English scientist, Sir William Crookes, startled the world with his warning of the possibility of a nitrogen famine which would be a major disaster to humanity. Luckily Science was ready with an answer, and about thirty years ago showed how Man might follow the example of the plants and extract nitrogen from the inexhaustible supplies in the air. To the layman, it must be one of the wonders of chemistry that with such elemental raw materials as coal, limestone and, of course, air it is now possible to produce as much nitrogen—mainly in the form of sulphate of ammonia and ammonium nitrate—as Agriculture will ever require. Great strides have been made recently in the methods both of manufacturing and of applying nitrogen. Since most land needs potash, phosphates and nitrogen, it has been found helpful to make up standard mixtures of the three foods in varying proportions and in concentrated strengths, so that the farmer need not go to the trouble of finding out the quantities of each food his various fields require, and then of making up his own mixtures. The fact that these complete concentrated fertilisers are produced in granular form instead of powder, which is very liable to cake, makes them much easier to spread evenly on the land, and even to apply through the drill as it sows the corn.

The tonnage of these fertilisers used on British farms every year is enormous, but is not as great as it ought to be. Large areas are still nitrogen-starved. It must be remembered that it is not sufficient to give the land a good dressing one year and leave it untouched for several years. The nitrogen does not stay put in the soil if the land is being cropped, because each crop takes it up as it grows, and the greedier crops may use almost all the season's dressing of nitrogen.

Nitrogen must therefore be constantly applied, as part of the farmer's yearly round. The obstacles to the more widespread use of these bag-fertilisers are twofold—prejudice and ignorance. Many farmers think that because they are chemicals, because they are brought in bags, and because they are not produced by some animal on the farm, that they must act as some sort of unnatural stimulant. Although this type of farmer cannot produce any evidence for his suspicions, he darkly hints that fertilisers exhaust the land, "they take the heart out of it." Much of this prejudice springs from the persistence of out-of-date notions about what is and is not natural, and is helped by the habit of calling these imported or chemically-produced mineral salts "artificial fertilisers" or "synthetic fertilisers." Those who still cling to the idea should understand that they are as natural as farming and muck. The only difference is that with lime, potash and phosphates Nature has done the work in a different way so that the minerals can be dug out of the earth. Man has done no more than copy Nature's methods of producing nitrogen from the air, instead of relying entirely on the plant doing it first, the beast eating the plant and passing on small and variable quantities in the form of muck.

The other obstacle is ignorance. There are still farmers who do not properly understand the nature of the substance called soil which is their basic raw material. They continue to practise what was preached by their fathers and grandfathers before them. They have not bothered to make the close inquiry which we have done in this chapter.



APPLYING FERTILISER





CHAPTER FIVE

BRITAIN'S LARGEST CROP—GRASS

NOWHERE can you travel far without seeing grass on one side of the road or the other. Indeed, there is so much grass in Britain that it is easy to take it for granted as a natural feature of the landscape, or something which is there, has always been and will always be. something which, like Topsy, "has just grown" and will go on growing.

As we have noted, the first farmer was a keeper of herds which fed on the wild grasslands or prairies, so that he had continually to be on the move in search of grass for them. Grass was thus the first agricultural crop to be recognised by Man. Secondly, it is the natural food of most of the animals of the farm, food which not only keeps them in health, but enables them to grow and, more important, to produce food for us. A diet only of grass enables a cow to produce milk, or a bullock or a sheep to grow fat. Thirdly, grass is both Britain's largest and richest crop. Even with all the turn-over from grassland to arable that has taken place during recent years, there remain far and away more acres under grass than any other single crop. It is both the cheapest and the easiest to grow. Also Britain's normally damp, mild climate (which I once heard Mr Churchill, with fine under-statement, describe as "our salubrious if not altogether unmixed dispensation") enables her to grow grass of a richer quality than almost any other country in the world. Grass, then, may properly claim pride of place among the products of our farms, and has the right to be considered first.

Although grass is grown all over Britain, a reasonable generalisation is that, if you draw a line from St. Andrews on the East Coast of Scotland straight down to Southampton Water on the South Coast of England, west of the line there



COCKSFOOT



CATSTAIL OR TIMOTHY GRASS

will be grass, and east of it arable farming. This, it must be repeated, is no more than a generalisation, but it is the fact that the prevailing winds which drive in from the Atlantic bring with them the rain that the grass needs, and of which it does not find enough farther east where the winds blow a dry and often icy breath from the Russian steppes or the Arctic regions. Grass farming may, as we have seen, take the form of dairy-farming, where the pastures are rich; stock-raising, in districts where the grass is distinguished by quantity rather than quality, or sheep-farming in the hills and mountains where the grazing is poor but good enough to sustain the hardy breeds of sheep.

When we talk generally of grass, we may all think we know what we mean and all of us can think of many different kinds. There is the crisp sort, close-cropped by sheep and rabbits, and spangled with tiny wild flowers and tufts of pink thrift, maybe, which grows on the thin soil on the cliff tops. There is another crisp, close-cropped kind which covers the round chalk skulls of the Downlands; or which straggles between the rocks and heather on the high hills and the meadows in the valleys. There is the deep green kind which grows in



MEADOW FESCUE



PERENNIAL RYEGRASS

the water-meadows, where the cows' hoofmarks fill with water, the snipe and the redshank nest under the tussocks and the kingcups shine golden in spring. There is the homely, familiar, English meadow, shut in by high hedges. Think of it in May when the hedges are tumbled snow-drifts of hawthorn blossom and the ancient sward is starred with wide-eyed daisies and yellow with swaying buttercups. It is a common belief that buttercups give the rich colour to farm butter, whereas they are really rank weeds whose presence indicates that the grass is not of the best quality and will not be good pasture for dairy cattle.

There are many other kinds of grassland, varying from the coarse and faded sort which struggles for existence among the sinewy bracken at the wood's edge, to the sleek, rolled and polished surface of a cricket pitch or tennis lawn. The fact remains that however many varieties we can think of, most of us normally regard grass as so many yards or acres of downland, meadow or cricket ground, as something which it is possible to dig up in sods or turves and to re-lay like a mosaic. That indeed was how most people thought of it until recently, and many farmers do to-day. The truth is that grassland is made up of millions of

separate plants just as grainland is a carpet of millions of plants of wheat, oats or barley. Where grassland differs from other crops is that it contains several distinct species of grass which grow to flower at different seasons of the year and which rejoice in names which are quaint and often descriptive—cocksfoot, fescue, crested dogstail, timothy, perennial ryegrass, creeping bent and Yorkshire fog. An interesting point is that the poorer the meadow the greater the variety of species of grass that will usually be found in it. This is because none of the plants grow very strongly and have therefore no power first to resist the intrusion of the airborne seeds, which like an invasion of paratroopers settle amongst them, and, second, to stifle and kill them once they have made their lodgment. The grasses which are most commonly found in the average meadow are perennial ryegrass, bent, fescue and cocksfoot, and of these, for example, perennial ryegrass will begin to grow in mid-March and cocksfoot in late April. Mixed with these grasses will be any number of plants which are not grasses, some of which are valuable, such as the wild white clover, and some which are weeds like buttercups, daisies, field rushes and the purple knapweed and the orange catsear. If there is sorrel it indicates that the soil is sour or acid, and means that it will certainly need calcium in the form of lime, and probably draining, since, as we have seen, acidity is often caused by the land being too wet.

It is only within the past 30 years that the truth that grass is a crop and not a piece of turf has become generally recognised, a recognition again due largely to the work of British agriculturalists, and which has already made a great difference in the way farmers treat their grassland and consequently in the rewards they obtain from it.

Before we launch into details of grasses and grassland it will help if we pause for a moment to see what we understand by the words field, meadow and pasture. To the layman any piece of farmland enclosed by hedge or fence is a field, and in general parlance that will pass—you can talk, for example, about a grass field as well as a wheatfield—but if you wish to talk the language of farming, or even to follow what I am going to try to explain about grass, you must be more precise. Field is a term applied to arable cultivation—a field of oats, peas or sugar-beet. Meadow and pasture are both grassland. The distinction between them is that the meadow is a place where grass is primarily grown to be cropped or harvested; while a pasture is used for grazing. Nowadays, the terms have become almost interchangeable owing to the spread of the new ideas regarding grass. Whereas in olden days the practice was to keep certain meadows for hay each year, and the pastures for grazing, the trend to-day is to vary the treatment, mowing and grazing by turns. The position has been further changed by the development of the system of ley farming which we noted in Northumberland on our train journey. Ley farming is no more than sowing grass in the same way as wheat, oats or barley. The crop may be either harvested or grazed according to the type of grasses sown and the needs of the farmer. The outstanding difference between grass leys and corn crops is that the ley is not sown in winter or spring to be harvested six to nine months later, but may be allowed to remain anything from one to seven years before being ploughed up and re-sown. The principal grasses used for leys are perennial ryegrass, Italian ryegrass, cocksfoot,

timothy and rough-stalked meadowgrass These will usually be sown, however, in mixtures with non-grasses such as white clover and lucerne.

Another thing we must understand is the meaning of the statement that grass is the complete natural food for most farm animals. To do this we must consider for a moment the kind of food which they need. First, they require food which will keep them alive and well; and second, which will enable them to grow by making flesh and bone, to fatten for killing; to produce milk. The farmer knows the former as the animals' maintenance ration, and the latter as the production ration. By and large the maintenance foods are bulky and rather starchy, such as hay, straw and roots, and the production foods are the more fully concentrated ones containing a good deal of protein. In the human diet, you may say that the maintenance or carbohydrate foods are the plant products such as bread, cereals, porridge, sugar or vegetables; while the protein is supplied in animal products like milk and meat and cheese and eggs. Our experiences in recent years have brought home to most of us the respective values of the two, though both are necessary, there is a vastly different feeling in rising from the table after a meal of carbohydrates alone, than after one in which they were balanced by sufficient quantities of proteins. Except that the human digestive mechanism is adapted to assimilate food in a different way, there is no difference between us and the animals of the farmyard. They, no more efficiently than we, can perform their functions without adequate supplies of protein to assist the carbohydrates.

To earn the title of a complete food, therefore, grass must contain protein as well as carbohydrate. And so it does, though this statement is only accurate if we think in terms of fresh, young grass; not of stalky old grasses, already beginning to turn colour, or of the weedy sward of a neglected pasture. While grasses are still in the earlier stages of their growth, while they are juicy and green, they combine all the items required by the grazing animal, that is proteins, vitamins and the valuable carotin which not only contains vitamins, but is the substance which gives the yellow colour to summer butter. (If you are fortunate enough to be able to have farmyard butter you will quickly see how much paler it is in autumn and winter than in high summer. When the cows are not getting fresh young grass the butter from their milk will be almost white—unless, of course, the artful farmer takes a hint from the beauty parlour and adds a little colouring matter, just to keep up appearances.) As the grass plant reaches maturity it loses its succulence, and its fibres become tougher and coarser. It loses also its fresh green colour and with it its protein and carotin



SORREL HEADS



MOWING A MEADOW

value. It changes from a complete food into one with less protein and more carbohydrate, a food, in short, which is nearer the level required for the maintenance than the production ration. We can summarise all this by saying that the farmer will get the best value from his grass while it is young and green and tender. On the other hand, that means using it during the months of, say, April, May, June, and possibly July in the north, when he will wish, of course, to rely on it all the year round. Let us see how he sets about combining the two—getting the most value out of his grass and making his grassland provide food throughout the year.

The question is what he wants from his grassland. Firstly, of course, he wishes to use it as pasture for his stock; that is, a place on to which he can turn them to graze and feed themselves as Nature intended them to do. Secondly, he will wish to harvest his grass and to convert it into food which he can add to the daily ration of his animals. In either case, the good farmer will apply the three sovereign rules of husbandry—cultivation, rotation and fertilisation—which he obeys for any other of his farm crops.

Permanent grassland—the meadows and pastures which have existed from times beyond memory, as opposed to the temporary leys—will be used for grazing and hay, and neither will entail much cultivation. Indeed, a little harrowing in spring should be sufficient to spread evenly the droppings of the stock and to tear out the dead and matted grass of last season and so let light and air get to the roots of the grass plants. Rotation is a word which almost explains itself and which we shall hear more about in connection with arable farming. Briefly it means varying the treatment given to a piece of land, season by season. Applied to grassland, it means that the good farmer tries never to use the same field for the same purpose two years in succession. If he turns his beasts on to it early in spring—say in March—and lets them graze it up to June, the next year he will keep them off it until mid-May. Permanent grassland, like any other kind of farmland, must have its rest if it is to remain in good heart. Also it should perhaps be stressed that though grasses grow at different times of the year, they, no more than other plants, grow all the year round. Because one kind of grass flowers after another, the effective life of grassland in England

may extend from March to October, but there will be no grasses growing between November and late February. Consequently, though the grassland will remain, it will be of little value as food because the grasses are all dormant. That does not mean that there will be no cattle or horses on it during the winter months; but rather that those which may be seen are turned out for fresh air and exercise more than nourishment; and most of them will be fed with turnips, kale or sugar-beet tops scattered on the grass for them.

It will not be long before you can tell at a glance the poorly-treated meadow from the well-kept one. In winter the poor meadow or pasture stands revealed as a place of short grass pimpled with warts which are grass-clad molehills or ant-heaps. In spring "thistle and dandelion and dock grow there, and a bush, in the corner, of may," probably several little bushes. Brambles fling wild tentacles over the rioting hedgerows and sullen nettles flourish in the ditches. The sward will bloom first with tall daisies and rank buttercups, and later with the grey spikes and purple brush of the thistle and the tough yellow columns of ragwort. Ragwort is a sure symbol of a ragged meadow, the enemy of any farmer, but fortunately the delight of the yellow and black caterpillars of the cinabar moth which swarm over it in summer and who quickly strip it to a bare stalk. The plants which will not flourish in such a sward are the succulent and nourishing grasses which are the justification of permanent grassland. The well-managed meadow will reflect its treatment in the neatness of its hedges and the even, uniformly green appearance of the sward. There will be few undesirable weeds and no unsightly hillocks, and as the breeze brushes the glossy, even-growing grasses they lie back like the hair on a sable fur. People who associate buttercups with butter and rhapsodise over the scarlet rash of poppies in the corn, may prefer the colourful, ragged-urchin beauty of the poor pasture to the well-groomed greenness of the managed meadow. The eye trained to appreciate fitness for purpose will make no such error, it will recognise poor grass as good land misapplied or carelessly tended, and register the unkempt pasture as a stage on the way back from farmland to jungle. It will not be long before you will come subconsciously to appraise the quality of the meadows and pastures you pass on your journeys. Your eye will be held at once by the really good ones and by the very bad ones—and you will find yourself mentally saying "That was a first-class ley," or "What a dirty pasture, hedges untrimmed, ditches choked and sward full of buttercups."

Obviously, the best way to make the best use of permanent grassland is, firstly, to encourage the grasses to begin to grow early in the year and to continue growing as late into the autumn as possible. Secondly, the more succulent varieties, which provide the richest food for stock, must be helped to flourish at the expense of the poorer species and the undesirable weeds. This double objective may be reached by fertilisation, assisted by managed grazing. To consider the second first. Cattle turned out early will naturally eat off the species of grasses which grow early, and thus give more light, air and room for those which grow later. If stock are held off until the summer the early grasses will have their chance. Furthermore, weeds also have their special time for growing, so that if the grazing is suitably managed, the sward can be made almost weed free.

The problem of fertilisation may be expressed simply by saying that the farmer will manure for what he wants the meadow to do. So long as the land is good the grass will, in fact, go on growing, year after year—witness the centuries-old record of Creslow Great Ground and of many acres in Leicestershire—though the modern idea is to plough it up after about seven years and re-sow it. Anyway, if the farmer is going to use a pasture just for stock turned out to fatten, their droppings will provide nearly all the fertilisation required. He will recognise, however, that the animal can only return to the soil a part of what it takes out, that part which it does not consume in nourishing itself, so if he wishes to use the grass for dairy cows or young stock which have to make milk or bone respectively, and therefore need larger quantities of mineral foods, he will dress the land with a mixture of potash, phosphates and nitrogen, or perhaps with phosphates and nitrogen only. If, on the other hand, he intends



RUINED HAY CROP

to put the field down to hay he will need to encourage the grasses to grow strongly by dressing the meadow with muck in winter and nitrogen, the growth promoter, in early spring.

This does not, of course, apply to the hill grazings. As we noted on our train journey northwards, the high hills of North England and the mountains of Wales and Scotland afford thousands of acres of grazing for sheep. As may be imagined, the quality of the grass on the steep slopes between the rocks and heather and the strip of cultivated land in the valleys, varies considerably, it will depend on the height of the range of hills or mountains, the rainfall, the type of soil, and the many other factors which we considered in the previous chapter. As a generalisation it is accurate to say that none of these hill grazings can compare in richness of grass with the well-kept lowland meadow. For one thing, the very incline at which they are tilted results in rain and brook and burn washing out of them the all-important nitrogen and other plant foods. That is one reason why the grass in the valleys is always of a deeper green than that on the tops; why also although the mountain sheep may be sweeter, "the



CARTING HAY, MODERN STYLE

valley sheep are fatter " Also, of course, their extent and inaccessibility make it very difficult to give them proper treatment Few, if any, hill farmers would ever attempt to do so, relying on the extent of their grazings and the ability of the sheep to thrive on the roughest of diets.

The grassland set apart for hay will be kept free of animals from autumn until after the hay has been cut, that is in late May in the South of England, and probably as late as July or August in the North and in Scotland Experience will teach the farmers when the grasses are ripe for harvesting, the right stage being when they are just short of ripe, or in full flower

Haymaking, or haysel, is a joyous time It cannot be called the crown of the farming year, for that is deservedly the title of harvest-home, but haysel is, to my idea, the most exhilarating of farming occasions Hay is the first of the farm's crops to be harvested, and over most of England and Wales it is brought home at a season of the year when the promise of spring is still unfulfilled, when "God's in His heaven, all's right with the world " This joyousness is clearly reflected in pictures of haymaking scenes in days long ago Then haysel was a yearly picnic when every one on the farm, men, women and little children, turned out to make merry, but also to work Indeed, every available pair of hands, however small, was needed to ensure that the work was done as quickly as possible, and so lessen the ever-present threat of bad weather. Some of the same spirit still characterises haysel to-day, when the process is almost wholly mechanised, and machines for making, collecting and for baling or stacking the hay have reduced the human labour force to a minimum Yet the wives and the sweethearts, the sisters and sons are still drawn to the meadows, still feel it necessary to be there at the year's first harvest-home

There is about haytime none of that lassitude, that end-of-season atmosphere of harvest-time. Over the greater part of England the summer still lies ahead and the cuckoo's call comes as fresh as the breath off the meadows Yet despite its inherent joyousness, haysel is an anxious time for the farmer. The moist

uncertainty of the climate which has favoured the growth of the grass is often the ruination of the hay harvest. No other farm crop can be so easily and irreparably damaged by rain, so every farmer prays for a fine haysel and only the most imperturbable are not on edge until the last load has been carted off the meadow.

Haymaking is one of the oldest practices of the farm, perhaps the original method of conserving food for the winter when animals cannot go out to graze but must be fed in the stalls or yards of the farm buildings. The grass is allowed to grow almost to ripeness, and is then cut with a reaper drawn by a tractor or, especially if the meadow is small, by a horse or horses. The cut grass lies in swathes, and the idea is for sun and wind to dry it so that it will keep dry and sweet throughout the winter and, if necessary, possibly for two winters. To speed this drying process the grass is turned either by hand or by a mechanical swathe-



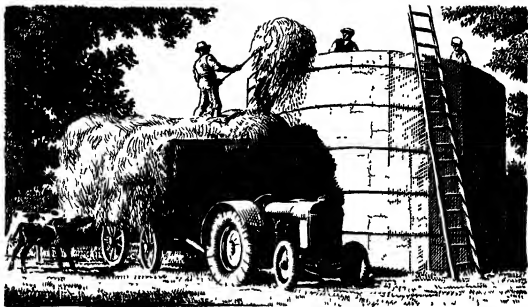
FELL-SIDE HAY-SLEDGE

turner and then made into heaps, which may be called either haycocks or pikes, according to the part of Britain. When these are dried out, the grass should have become hay, and the cocks are loaded on to wagons and tumbrils and taken away to be stacked in the farmyard, or stored in barns. If it has not dried thoroughly it will become mouldy, and unpalatable as food for stock and may even catch fire by the process of internal combustion—bad enough when the hay is in stack, but extremely dangerous if it has been stored direct in a barn.

As we were crossing the plain of York by train I mentioned the Yorkshire dales where practically the only crop is grass. I used to live in Nidderdale when a boy, and the only other crops I can remember were a few fields of swedes or mangolds. There were daring farmers who now and then planted oats, but these never seemed to ripen and at harvest-time, still a sickly green, they were nodding their heads in dejection before the advance guards of the winter gales. Certainly it was never seemly to include "All is safely gathered in" among the harvest festival hymns. These dales are steep, narrow valleys on limestone.

There are, therefore, no hedges but only rough stone walls and sturdy stone farmsteads, simple affairs consisting of a house joined to a barn into which the hay is pitched through a high-up door or window, and a cowshed or "mстал," to give it the local name. The hillsides are so steep that it is not possible to work the hay harvest down by horse and cart, so sledges with smooth wooden runners are used. These are easy for the horse to pull empty up-hill, and steadier for it to draw fully loaded down-hill. Moreover, a heavy load will not topple off as it would from a cart.

Hay is made throughout Britain. The general method is the same, though different districts have their own special ways of doing this or that. For example, the fine, square stacks shaped like a quartern loaf which you will see in Southern England, give place farther north to much smaller ones, until in Scotland the farmers practise a policy of dispersion, two and more small stacks like pointed haycocks being preferred to one big one. The ropes or wagon-covers weighted down with stones which lie over these afford the clue—the farmer is guarding against the northern winds which have force enough not only to blow a stack to bits, but to carry it bodily away.



CHAPTER SIX

SCIENTIFIC GRASS PRESERVATION

HAY then is made of grass which has just been allowed to come almost to ripeness, and secondly, has been dried by the sun and wind so that it will keep sweet and palatable for a twelvemonth or more. Obviously, as a glance at a haystack will show, it has lost its greenness and much of its succulence. Ergo, as Shakespeare would say, it cannot have the same complete nourishing property as fresh grass. It has lost most of the carotin and some of the proteins, so that, generally speaking, it is regarded as a maintenance rather than as a production ration. That is to say, it contains enough nourishment for those bullocks which we saw making muck in the yards, but not by itself enough for the dairy cow in full milk. This also is no more than a reasonable generalisation, because the quality of hay may vary as much as the quality of the grass from which it is made. At one end of the scale, the best hay well made in a fine season from rich grass may almost measure up to the standard of a production ration; at the other, a musty product of stalky grass and weeds is scarcely worth ranking as even a maintenance food. The quality of hay will depend on the skill of the farmer, the clemency of the season and the state of the grassland, but it will never have the same value as the fresh grass.

It is not therefore surprising that farmers should look for ways and means to make grassland yield a production food, to do which meant finding a method of preserving grass without losing its proteins, vitamins and carotin. The search began in the last half of the nineteenth century, but the biggest developments date from no further back than the decade 1925-1935. Two main methods were

tried and found sound. To-day both are firmly established in the pattern of British farming practice, although neither has yet attained the universal application of haymaking. They are silage and grass-drying.

Silage describes grass treated by the process of ensilage; in other words, grass which has been cut while still young and green, and ensiled, or packed into a silo. As you go about the country, you may notice among farm buildings a circular, concrete erection, rather like a small gas-holder, about twelve to fourteen feet in height. This is a modern type of silo, which you can describe as any container into which grass can be loaded and stamped down. Some silos may be made of wood, some of wire-netting lined with thick paper. Some may be improvised on the farm out of old pieces of corrugated iron or planking. Some may be trenches dug in the ground, drained and lined with concrete. The essential is that one and all must be strong enough to withstand heavy pressure. What happens is that the grass is cut when it is from six to eight inches high. It is then taken straight off the field, while still fresh and green, and spread evenly, cartload by cartload, in the silo or trench. Each load is well stamped down and the container finally sealed with some sort of covering and a heavy weight of stone, turves or earth. Over a period of months the grasses, tightly-packed under pressure, form into a mass

which can be cut like hay, but which is moist and succulent. Like hay, the quality of silage will vary according to the skill with which it has been made and the quality of the grasses. Unlike hay, it will not be at the mercy of the spring showers or summer thunderstorms. If, when the silo is opened, the product is a deep, olive green in colour and has a pleasant but acid smell it will be top-grade silage, which has preserved the nourishment of the young grass and is a complete food even for the queens of the dairy herd which give four gallons of milk and more each day. If the silage is brown and sweet-smelling it is of less value. Much of the nourishment in the green grass will have gone with the colour; and though the animals will eat it with relish, it will not be of much benefit to them, and will certainly not measure up to the needs of the high-yielding cow. Sometimes it will be yellow and smell to high heaven, a sickly, rank smell. This is poor silage to be set on a level with musty, rank hay as evidence of effort which might well have been put to better use on the farm.

Silage was first developed in Europe, one of the original methods being to assist the conservation process by sprinkling salt over each layer of grass as it was stamped down. It was taken up in America and reached Britain from both continents. The early methods were first the pit and next the tower. Pits soon gave place to the tower method which employed a wooden, tower-like structure, about 40 feet in height, specimens of which add a hint of mystery to



SAINFOIN

the countryside and which you are almost sure to see still standing here and there, though few are in use to-day. The idea of the tower was to create the necessary pressure by piling the mass to a height; but the method, which had been developed in the U S A to ensile arable crops, particularly maize or Indian corn, was not found to be so well suited to grass. (It should be known that all sorts of crops other than grass can be ensiled—lucerne, sainfoin, oats and vetches and other corn crops.) For many years interest in silage was at a low ebb in Britain, but in the 1920s several new methods were examined and tested. A promising one came from Finland, where excellent silage had been made by treating grass with a solution of sulphuric acid and hydrochloric acid—of all unlikely things. When it was tried in Britain it was soon clear that its success rested on the intense cold of the northern winter, and that it would not give satisfactory results in our “more salubrious but not unmixed dispensation.”

The method which was found best suited to British conditions and which is most widely used to-day is based on molasses, and since molasses is sugar, the wheel has turned full circle from the early experiments with salt. The molasses, thick black treacle, is sprayed on to the grass as it is packed into the silo or trench. Every year many thousands of tons are used to produce rich winter food for British cattle, and each year sees new developments in the technique of making silage and fresh recognition of its value. The container now most favoured is the concrete-lined trench. It is easier to pitch the grass *down* into a trench below ground than *up* into a container above ground. It is easier also to press it down by running a tractor back and forwards along the trench than by having the men march round and round the container in rubber waders, stamping with their feet, while another man squirts a thin spray of black treacle on to it. It is also far less messy. The essential is that the trench has well-made drainage, so that water will seep away and not spoil the silage.

As you may imagine, silage-making is a strictly practical method of conserving grass: it has none of the joyousness of haysel. But since it does not depend on the weather it is ideally suited to farming conditions throughout the British Isles. Since it gives so rich a food it is of the first importance to the farmer, helping him considerably to make his holding self-contained; independent, that is, of the animal foods he must otherwise buy from outside and most of which probably come from countries overseas. The sooner silage can take its place alongside hay as a standard product the better for British agriculture, but it is still regarded among certain types of farmers as a new-fangled idea. It is a fallacy, widely-held but none the less a fallacy, to think of farmers as reluctant to accept new ideas. The better types of farmers are possibly readier to try new methods than any other class in the community. There is undeniably a section of farmers, mostly men working holdings which are too small to be efficient economic units, who cannot afford the money to move with the times, even if their intelligence allowed them to do so. It is these who turn a deaf ear to the claims of silage.

If there is some resistance to the silage method of treating grass, how much more should there be to the second method which has been developed in recent years—grass-drying. For this is nothing less than an extension to the farm of

the practices of the bakehouse or the iron-foundry! As soon as scientists and agriculturalists had begun to study the dietetic properties of grass, they had noted the connection between its green colour and its food content. Green, they saw, was the outward and visible sign of the inward and material value of grass. Incidentally, this colouring matter is supplied by chlorophyll, a substance which it may be interesting to know is chemically the same as haemoglobin, which gives the red colour to blood. The problem was accordingly to devise a means of conserving grass so as to retain the chlorophyll, and to keep it green as well as wholesome. Put another way, the problem was to dry grass quickly before the colour faded. The result was that between the years 1927 and 1935 grass-drying was born—another all-British contribution to the science and practice of farming. What the scientist did was to substitute concentrated artificial heat for the fitful natural heat of the sun, and to dry the wet grass, cut in the vivid green growing stage as for silage, by hot air generated by a machine fired by gas, oil, coal or electricity. Experiments were made with all sorts of different drying machines before the process was satisfactorily worked out, and research still goes on to improve it in its details. Most machines embody much the same ideas, the grass, with all its natural moisture and often wet from rain or dew, is loaded on to wire-meshed trays, placed over a blast of hot air. The grass is forked over or tugged, to use the correct word, as it lies on the tray so that it all has a chance to dry. This first drying lasts about 15-20 minutes and is intended to remove all the superficial moisture and some of the inherent moisture. Then the grass is transferred to a second tray—or alternatively the tray shuffles across over a second blast of hot air—and is exposed to a further ten minutes' heat. This should complete the process. Skill and experience is needed to ensure the best results, because if the grass is heated either too hurriedly or too long, its vitamins and carotin will be destroyed and it will become indigestible and so lose its protein value. The test of successful drying is in the colour. The product should be a lovely green, and, of course, smell sweetly, the scent resembling that of fresh grass rather than hay. It is then either baled to be fed to animals in stalls; or the process may be taken further and the dried grass milled into a meal which looks something like pea-flour only of a brighter shade of green. This meal is widely used to make into compressed cubes for feeding to cattle, or is mixed with other materials to make poultry foods. It can also, curiously enough, be eaten by human beings, whose stomachs are not normally able to digest new grass, despite the biblical case of "Nebuchadnezzar, the King of the Jews, who suffered from new and original views," or the claims of one or two intrepid if eccentric experimenters in our own times. The milling process appears to break down the coarse cellulose fibres which baffle the normal human digestion, and I have eaten grass meal in soup and on porridge. Both ways it tasted good and had no ill-effect. In parenthesis, some ardent researchers attempted not so long ago to produce a grass cheese for human consumption by squeezing the juices out of young grass. The result was not satisfactory! Because dried grass contains a high percentage of chlorophyll, the meal is sought by makers of women's beauty preparations for use in the manufacture of face creams.

Despite its novelty and its tie-up with the technique of the factory, grass-

drying has already won its place in British farming practice. The idea of artificially drying crops has developed greatly of recent years. It has been applied to lucern, corn and other crops as well as grass; and of course to vegetables for direct human consumption, those dehydrated vegetables which can be bought in cartons from the grocer instead of fresh and earthy from the greengrocer. What a distinction there is between the grocer and the greengrocer! Chesterton would never have accused the latter of being a "mystery and a sign, that men might shun the awful shops, and go to inns to dine" Thus by the way The point is that the artificial drying of farm crops seems an obviously sensible idea for a country with a climate as moist and uncertain as ours It is surely justifiable solely on the grounds of insurance against loss from bad weather at harvest-time. It is doubly important as a means of retaining in the dried, storable food the summer nourishment of the growing plant The early tendency was for farmers to concentrate on drying as a speciality, and to plan their whole cropping to feed big drying plants, but it is likely that the future will see the dryer take its place among the normal machines and equipment of the farm. No farm will be held to be complete without its own small drying machine. A grass-drier can be recognised as a building like a small hangar, partially walled and roofed with corrugated asbestos

These two big advances in grass conservation—silage and grass-drying—developed about the same time as grass was becoming recognised as a crop, though quite independently of this The coincidence was fortunate because both processes demand young, good-quality grass such as is provided by ley-farming This is the idea behind ley-farming: to ensure a supply of good grass by sowing it instead of trying to grow it from the ancient swards of permanent meadows. Some expert farmers make a speciality of growing grasses for seed. Mixtures made up of the seeds of different grasses are sold to farmers, who drill them in as they do their wheat or barley Indeed, the grass seeds are usually sown with barley and at the same time, so that the barley, which grows quicker and taller than the grasses, shall act as a cover crop or nurse crop, to give the grasses protection until they have firmly established themselves. Then when the barley is harvested, a thick green carpet is disclosed between the dry white bristles of the stubble. Next spring the stubble will have disappeared and the field be a rich grass ley The danger the farmer has to avoid, of course, is that the nurse will overlay the baby: that the barley will be sown too thick or will fall over on the young grasses and stifle them by keeping from them light and air

The types of grasses in these mixtures are carefully chosen, both from the point of view of height and the time at which they each grow. A usual mixture includes the tallish red clover with the shorter wild white clover or one of the



WILD WHITE CLOVER



specially-bred clovers; and several grasses, some tall and some short. This gives a ley suitable for grazing, for mowing as hay or for cutting early for silage or drying. In certain districts special grasses will be favoured, Italian rye-grass, for example, or timothy by itself. There is no end to the permutations and combinations that can be evolved according to the requirements of the soil or the season, or the purpose or fancy of the farmer. Whether the ley is to be used for grazing or cropping, it will, of course, need fertilisation with phosphates, usually in the form of what is known as basic slag, a by-product of the steel-works, and some nitrogen to encourage growth. If it is to be reserved for dried grass or silage it may be given a far heavier dressing with nitrogen to stimulate it to grow so that it may be cut and cropped twice a season, in May, say, and again in July. Farmyard muck will be supplied through the droppings of the grazing animals. It will not be long before you can pick out the ley from the permanent grass. There is a depth of colour, a uniformity of growth about the ley which distinguishes it at once. It looks rich, and has more of an air of being cared for than the permanent grass. It has, of course, youth on its side, but its life is destined to be a short and a busy one. The grasses will be made to give their maximum value for one, two, five or seven years, but as soon as they show signs of becoming exhausted or too thick with unwanted weeds they will be ploughed in, and a new ley sown.

Mention of weeds raises a point which shows how Nature hits back. Judged solely on their food value, most weeds in grassland are of little value, quite apart from their damaging effect on the grasses, so the farmer has good reason to try and eliminate them. A new ley is almost weed-free, and with care can be kept so. The odd thing that happens is that cattle turned into one of these specially-prepared, rich food pastures will eat at first with obvious relish, then they will begin to cast about as if to say—What else for dinner?—and before long will be found snuffing and blowing round the hedgerows in search of weeds! They will make a snatch at a shaggy head of nettle which sticks out of the hedge bottom, or even munch a twig or two of hawthorn with obvious relief. The inevitable conclusions are that weeds have their purpose and place in the animal's dietary; and that cattle, like human beings, cannot long be happy on a diet carefully selected and prepared to do them good. They want change, variety, and probably also need the medicinal effect which many weeds may exercise.

In addition to grassland proper, whether permanent or temporary, there are the grass-like plants, such as lucerne and sainfoin. Both are easily recognisable: the lucerne a rich green, feathery-looking crop of about twelve to eighteen inches in height with a handsome dark blue or violet flower; the sainfoin a little taller with a conspicuously pink blossom. It is, I find, one of Nature's most fitting artistic arrangements that the yellowing fields of corn should carry weeds such as scarlet poppies or blue cornflowers, whereas the soft pink carpet of a field of sainfoin almost always twinkles with white moon daisies. Both lucerne and sainfoin may be used for grazing, mowing, for hay or for making into silage or dried grass. Lucerne has long been coming into Britain from America in dried form known as alfalfa or alfalfa meal, but it is now being increasingly



LUCERNE

grown here. It is a rapidly growing plant, whose special merits are that its roots shoot down very deep into the earth—depths of 30 feet have been known—and that it quickly recovers growth after cropping. It is accordingly an excellent crop to set on the light, sandy lands where its roots help to bind and fix the soil. The depth of its roots is also a guarantee that an unusually dry summer will not destroy the ley. For centuries the brecklands of Norfolk, wide sandy wastes which grew only sparse heather, a sprinkling of pine and birch, and clumps of gorse and bracken were useless to agriculture. They were left to the rabbits and the wide-eyed stone curlews. Lucerne has transformed acres of them into valuable farmland. The roots of the plant penetrate below the sandy top soil and enable the crop to survive the dry summers and at the same time form a mat which collects humus and nitrogen and transforms the soil from sandy particles to a coherent mould. Even on these brecklands lucerne is so little checked by cutting that it can be cropped as often as four or even five times a season, an obvious recommendation to the keen maker of silage or dried grass. It is often used with grasses in mixtures for leys—especially cocksfoot and timothy.

We must not close this chapter without mention of stover, the hay of the grass-scarce counties of East Anglia. Stover is clover treated for hay in the same way as grass. The clover is, of course, sown down as a ley and only stays down one year, during the summer of which it is cut twice—the first time for stover, the second for seed. The point to note is that it should only be grown once in six or eight years on the same field or the land will become “clover sick.”



CHAPTER SEVEN

PREPARING ARABLE LAND

GRASS may excusably be regarded as an integral part of the country scene, as something which exists in the course of Nature and has been no more than developed by Man for his own uses. The arable crops—the grain, the roots, the potatoes, the peas and beans, and the noble if unlovely family of cabbages known as brassicas—will prompt no such line of thought. As you pass fields of them on both sides of the road, their regimental ranks and uniform growth proclaim them the deliberate result of human design and execution, unmistakably as carefully sown and tended as the most exotic plants in the herbaceous border or rock garden. These to the layman will at once declare themselves as farm crops in a manner which grass does not, so that it is worth re-emphasising that over wide areas of our green and pleasant land they will be less conspicuous than grass, and of minor significance in the farming scheme of the locality.

Arable is a more colourful as well as a more obviously man-made way of farming. Instead of variations on a theme of green, the landscape is a medley of different colours which change kaleidoscopically with the seasons. The bare ploughland, red or chocolate or black, may burgeon with the vivid emerald of young wheat or oats, the deep-green gloss of sugar-beet, the blue-grey of swedes, or the fern-like feather of carrots, and then turn to the amber or copper of the ripened wheat, the bleached white of the barley, or the paler greens and yellows as the beet-leaves wither in autumn. It may carry a crop of potatoes, the ridged rows in regular ripples crowned with flowers of white or mauve, or of cabbages, a sea of bobbing steel-grey balls on stalks. Some fields will be lit by the sulphur-

yellow flame of charlock or the blaze of scarlet poppies. Beware these bright colours: on farmland they are signals of a dirty field in which the rioting weeds wave their gay banners to divert attention from the damage they are doing to the crop.

Let us first list the arable crops which we are certain to see in our walks and journeys. First, there will be grain, wheat, oats, barley and rye: and next the root crops, sugar-beet, swedes, mangolds, turnips and carrots. Thirdly, there will be potatoes, so well-known as a garden crop that they will be immediately recognisable, and fourthly, the brassicas, which include the homely cabbage and the perhaps too-familiar brussels sprout of our vegetable menus, as well as many items on the animal's dietary, such as marrow-stem kale and the picturesquely-named thousand-headed kale. Lastly, there will be a wide range of special crops for special soils and special purposes, from those grown to produce seeds, to others like flax or chicory, and many of which come so close to market-gardening that they fall outside the purview of an introduction to farming presented in such broad outline as is this.

It is in the preparation of the soil to receive the seeds of these crops, and in the provision of the most efficient conditions for them to grow in, that the bulk of the farmer's working of his land is done, all the ditching and draining, the mucking and fertilising, the ploughing and pulling about which we have already considered in detail. It may help to refresh our memory by summarising this treatment.

In autumn or early winter the land will be ploughed to turn in the remainder of the season's crop, together with all the weeds that have lodged in it, as well as the farmyard manure, which has been carted out of the yards and spread ready on the fields; and to help the rains of winter to drain away as well as to let in light and air and, most important, the frost. Ploughing also turns the grubs up out of their earthy retreats for the birds to eat. Watch as the plough gets to work how robins and wagtails bob up as from nowhere; rooks, like a synod of clerics in cassock and bands, stalk solemnly in the furrows, and ever-hungry seagulls swirl down to join in the rich fare spread for them by the ploughshares.

To digress for a moment, the farmer's offensive against the beasts and creeping things innumerable which waste the produce of the land and devour the seed in the ground is, of course, prosecuted relentlessly throughout the year and with all arms. Even chemical warfare is waged against them—and what a formidable army they are! Firstly, there are the obvious predators like rats, and the less obvious ones such as the prolific rabbit, which fouls grassland and kills young trees by stripping their bark, in addition to eating grossly of farm crops; and that alien tree-rat, the grey squirrel, whose appetite is as large as it is indiscriminating. There are the feathered robbers, the pigeons, doves and sparrows; then the insects; and finally the long list of ills that the plant, as much as the flesh, is heir to.

The insect pests are legion, but we may in passing note two ubiquitous and outstanding enemies, the one of arable and the other of grassland. The former is the click beetle, whose appearance is not unattractive and whose name conveys

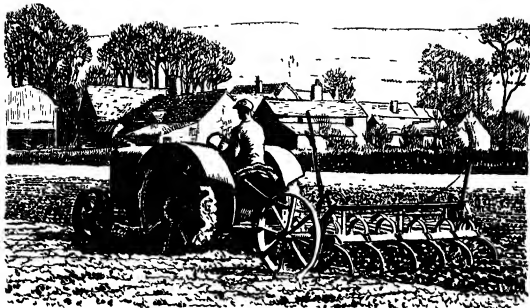




A WHEEL PLOUGH

little to many folk who suffer from its onslaughts in another stage of its existence. That is to say, the beetle passes a large part of its earthly life as the lithe and energetic wire-worm, whose appetite and numbers make it a formidable destroyer of crops. Its home is principally in old meadowland, an acre of which may hold anything up to two million worms, but the edge of its hunger is apparently soon blunted by the tough grass roots and it does little enough harm to the sward above. As soon as the land is ploughed and sown down with a crop, the freshly-planted seeds give the wire-worm such an appetite that it may easily strip a whole field by devouring the shoot just as it starts to swell and sprout. No matter how stern the war against the wire-worm, its yearly destruction of food is still enormous. The other insect is none other than that nursery nuisance, the daddy long legs. This awkward, rickety and brittle creature, the original of Mr Lear's "floppy fly," does little more positive in its insect life than blunder into candle flames—except lay a prodigious number of eggs, from which, in the fullness of time, hatch the repulsive leatherjackets, bane of groundsmen and greenkeeper. Golf greens, tennis lawns, cricket pitches, meadows—all are attacked and, if they are, the most zealous care and preparation of the surface will hardly stop the grass dying and bare patches developing. One year even Lord's was invaded and the pitch set aside for a Test match against Australia threatened. Sacrilege in cricket's holy of holies! For all the leatherjacket, as sturdy as the daddy long legs is spindly, look so slothful, he is a fast worker when he begins.

At the other end of the list are the fungoid diseases which particularly affect the grain crops, and which rejoice in such elegant names as "bunt," "rust," and "stinking smut"! These are guarded against by dusting all the seed corn with powders containing mercury. Roots have their special ailments and epidemics, such as raan, which we have already seen is caused by a deficiency of boron in the soil and affects turnips. Turnips and swedes are also victims of a very small insect known comprehensively as "the fly," about which more later. A small



THE CULTIVATOR

library could be written about farm pests, the damage they do and how they are combatted and destroyed

To return to ploughing, for centuries the plough was a simple affair with two handles and one blade or ploughshare to bite into the earth and turn it up: steered by a man and drawn by two horses. Horse-ploughing is a craft, and the experienced ploughman is an expert in managing his horses and in drawing his furrow straight as a ruler. His hands are needed not only to steer the plough, which is a task demanding skill as well as strength, but also to guide the horses by means of cords, or sometimes by one cord only. The truth is that they usually act more on the orders the ploughman sings out to them. In my part of England he calls "Cuppy-whee" if he wishes his team to turn to the right and "Wirree" if to the left, but the more general words are "Gee" and "Haw," though they will vary from district to district. Plough-horses, it seems, still need to be bred and trained to the dialect of the locality. In the Eastern counties, drawing matches, as they are called, are still popular events, all the farmworkers who fancy their skill at ploughing entering the competition to decide who can draw the straightest and most even furrow.

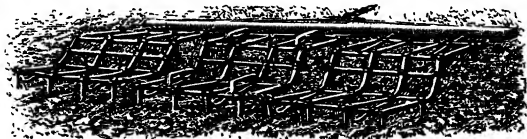
To-day, of course, ploughing, especially of wide acreages, is mechanised. The plough may have from one to four shares, and is pulled by a tractor. The driver controls the plough by a cord; when he turns at the end of each furrow he jerks this to lift the share clear of the ground, then gives it another jerk to lower the share into the earth again at the start of the next furrow. For all that it looks so much easier than steering a horse-plough, and, of course, demands so much less physical effort, tractor-ploughing requires skill and experience if it is to be well done. Nor am I one of those who lament the advent of the machine. True, there are few more beautiful scenes on the farm than a great field of ploughland

with perhaps three or more teams of horses at work, their necks arched, their muscles rippling. Some will prefer the great Shires, with their hairy legs, others the dapple-grey Percherons, brought originally from France; others elect for the chestnut Panches of Suffolk; or the quick-stepping, white-gartered Clydesdale of the North, but all must agree on the strength, the grace and the rhythm of their movements as they pull plough or harrow or roller. There is no such æsthetic satisfaction in the sight of a tractor, except that when its paint is new, it makes a nice shiny blob of red or yellow in the field, but I find the steady whirr of a distant tractor-engine a gladsome sound, and when all my neighbours are busy on their land in autumn or early spring the air vibrates from dawn to dusk with the deep burr of dozens of tractors telling of energy well applied.

It should not be long before a glance will tell you if a field has been ploughed well or badly. The freshly-turned furrows of a good plough will run straight as railway lines and be even in depth and width.

Once the land ploughed in autumn is dry enough, it may be cultivated as well as harrowed and rolled in early spring. The cultivator is a machine which is designed to loosen the under-soil without turning it over, that is, it does its work by means of long, sharp claws which work well beneath the surface, to the full depth of the furrow the plough makes, or even below. The idea is to make sure that the soil is aerated and permeable, and not just worked on top and a solid mass underneath. Harrowing, on the other hand, is surface treatment and will be done at this stage to break down and fine the top soil, to smash up the big clods and generally to leave the field with a fine, flat surface like the tidy bed in a vegetable garden. The harrows which are used for this purpose are known as seed-harrows, of which there are several types. The best known are probably the old duck-foot and chisel harrows and the more modern zig-zag type, the names in each case being descriptive. Thus, the duckfoot has the iron teeth shaped like a bird's claw, and the zig-zag is arranged in separate and parallel zig-zag sections, so that it has what is properly described as an articulated action.

Rolling is another operation in preparing the soil for sowing, and, as you will notice, the rollers are of two kinds. There is the flat roller, which paradoxically is round, but being smooth leaves behind it a smooth, flat surface; and there is the ring roller, the cylinder or barrel of which is made up of separate, narrow rings, and leaves a serrated surface. Just as I always picture to myself ploughing as a job done against a grey winter sky, so rolling calls to mind one



ZIG-ZAG HARROWS

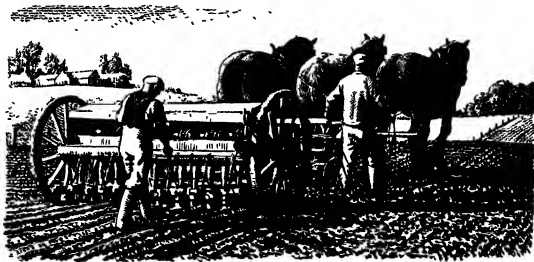
of those prematurely hot days in March, when the harrowed fields are dry and dusty. The clods of soil are hard as pebbles, and as the horses pull the roller over them each ring, striking against the next, sings with the joy of returning spring. The sound comes down the breeze like the chime of a distant bell to tune with the busy bass of the bees, buzzing round the aconites and celandines with energy after their long winter sleep. Rolling over, the work of sowing or drilling begins. You will recognise the drill as a sort of upright piano set between two wheels. At the bottom there is a row of hollow coulters, or of pointed funnels set alongside circular discs like those of the disc harrow. The seed is fed into the top of the machine, and as this is drawn over the harrowed and rolled surface of the field the coulters or discs cut thin grooves into the earth into which the seeds run down at regularly spaced intervals. As we noted earlier, the growing practice is for the drill to apply mineral fertilisers at the same time as it sows the seed. Often it will be followed by another drill sowing clover, grasses or lucerne to come up through the stubble and follow the grain crop with a green one. Drilling is carried out from the middle of February up to the middle of May, according to the locality, whether in Southern England or Scotland. During this period almost all arable crops will be sown except winter grain, particularly wheat, which is drilled in autumn to stand through the winter, and Indian corn or maize, which must be sown late, because the seed will do no more than swell and then rot in cold soil. Even in the South the soil is rarely warm enough for maize until May, and it will not be planted at all in the North as there will not be enough heat to ripen it. After drilling, the land is harrowed lightly to rake the soil over the seed rows, and if the season is a dry one it may be rolled to bind the surface and stop the soil blowing away in dust.

It should be noted in passing that the winter wheat is rolled and harrowed in early spring, though the shoots may be already an inch to three inches above ground. If the crop is thought to be too thick it will be harrowed to thin it, if too thin, it will be harrowed to thicken it, the explanation of this seeming paradox being that it all depends on the stage in the plant's life when the process is carried out. As the corn grows it starts to put out side-shoots which are known as tillers. If it is harrowed after tillering has started, the tillers are broken off and the effect is to thin out the crop, if before tillering, then the effect is to encourage them to grow and thus thicken the crop. The choice of the correct moment to do this will prove the skill and experience of the farmer.

Knowing when to act is as important as knowing how to act. In one sense farming is a practical science which can be written about in books and taught in schools, but it is equally an art which can neither be explained nor learnt by rote. For example, I can outline the doctrine of fertility and describe the steps the farmer takes to practise it in a manner which I hope you may be able to grasp, but that will not make either of us successful farmers. Indeed, a farmer may be immensely knowledgeable and able but yet not have that affinity and sympathy with his land and stock which is fundamentally the secret of success. The born farmer—a cliché but which expresses what I wish to say—has an instinct for doing things, when as well as how, which he may have inherited from generations of farming ancestors or acquired by observation and experience

from his earliest childhood. The important fact is that he has it, and his possession of it will show in his decisions as to the best time to plough, to harrow, to roll, to drill and to sow. He knows it is as bad to overwork the land as to underwork it; if he overdoes it, his soil will be too loose and dusty if the season is dry, and a puddly mess if wet. He may not be able to explain why he chooses one day rather than another or, like a Test match cricket captain, prefers one roller to another; why he may seem out of step with his farming neighbours; or courts restiveness on the part of his men, who are kept kicking their heels while he waits for the moment which he feels in his bones is the right one

There are strictly scientific people who incline to decry the mystery of farming, and wave aside so much of farm lore as old wives' tales. There was an old wives' tale once that certain moulds had healing properties; that was several hundred years before Science jubilantly announced that in penicillin it had dis-



SOWING WINTER WHEAT

covered a mould with healing properties. Maybe some of the traditional rules and precepts do sound dated and even comical. The modern farmer may, for example, watch his barley, and harvest it when his reason and experience tells him it is ripe. Against this the advice of the older generation is that "When you are sure your barleys are fit, then do you go away for a fortnight's holiday and cut them when you come back. That won't be a day too late." Seeds must not, of course, be sown while the land is wet and cold, as they may rot before the sun's heat comes to help them germinate. There is a niceness in judging the earliest moment when the soil is warm enough to receive them; and well into the present century farmers in Suffolk would gauge this by the simple process of taking down their breeches and applying their bare posteriors to the earth—a test which it may be hoped was as effective as it must certainly have looked odd to the uninitiated!

Come to think of it, since farming demands a sympathy with the moods of

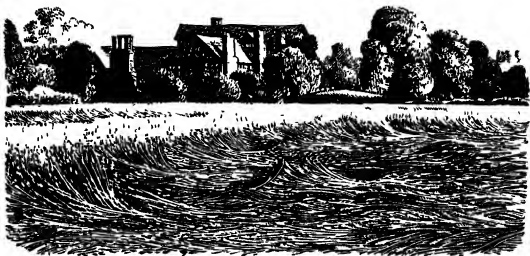
Mother Nature as well as knowledge of natural laws, it follows that something more than reason and knowledge are needed to practise it successfully.

The only operation that remains to be noted is the hoeing or harrowing necessary to keep down weeds, or to thin out certain crops. Whereas weeds reduce the value of grassland but slowly, they can ruin a year's arable crop if allowed to develop unchecked for only a few weeks. You will find it as easy to pick out the clean fields from the dirty ones as a good meadow from a poor one, but besides all the flamboyant weeds like poppies, daisies and charlock, whose blossoms catch the eye, there is a formidable array of others which are less conspicuous but whose presence is as damaging. Chief among these is the harsh, tough couch grass, otherwise known as twitch or wicks.

In olden days, the fields once sown (and of course the seed was then broadcast by hand, "behold a sower went forth to sow") were constantly scuffled by men with hoes. Hand-hoeing is still done, but nowadays rather for thinning out or "singling" young plants, like kale or sugar-beet. Hoeing for weeds is now carried out by a horse hoe or a tractor-drawn one; but generally speaking, if the field has been properly prepared, and the stubble well turned over by the plough, there should be little danger from weeds in the early stages of the crop's growth. Once the grain crops have established themselves, their tall and rapid growth will automatically keep the weeds down to safety levels, though however clean the field was to begin with, weeds will always find a lodgment in it. Watch how, as the barley bends as it nears ripeness, the upstart thistles thrust their shaggy grey heads through it. Note, too, how when wheat, oats, barley or rye are cut at harvest-time, a green carpet of weeds will be disclosed. In short, the control of weeds is more a matter for prevention than cure. If the preparatory work has been done thoroughly, they will not constitute a menace, nor need to be eradicated by hoe or harrow.

Acting on the principle that prevention is the better policy, farmers are making increasing use of chemicals in their war against weeds, though the trouble about most weed-killers is, of course, that they kill indiscriminately, destroying the good plants with the unwanted ones. As you may have found out in gardening, they are most effective on paths, but disastrous in the herbaceous border. It has, however, been found that if a field of young grain is sprayed with a solution of sulphuric acid it will not suffer, but the unwelcome charlock, which lacks the protective outer sheath of the wheat shoot, will be shrivelled up. More recently new organic chemicals have been developed with the remarkable property of being deadly to a large number of weeds without effect on grain crops. That may explain why the pungent smell of a chemical factory has been added to the scents of a May morning, most unwelcome as it assails your nose and larynx on your walks or drives through the farmlands in spring. It is decidedly not a pleasant smell, but you may remind yourself that it is evidence that the farmer is ensuring that he will reap the grain he has sown, and not a mixed crop of some grain and more weeds.

Ploughing, cultivating, harrowing, rolling and drilling—with hoeing at a later stage to thin the crop and to destroy weeds—are the arable part of arable farming. They are the mechanical operations which constitute cultivation.



A "LODGED" WHEAT FIELD

There remain fertilisation and rotation. Fertilisation we have already considered in detail, but it may be added that one of the dangers the arable farmer has to guard against is over-fertilising, especially of his corn crops. If he does this they are liable to outgrow their strength, to make long and weak straw and possibly heavy ear so that either on their own account or under pressure of wind or rain they fall over or "lodge." You will notice that some fields, especially of oats and barley, that you pass will lie almost flat. Occasionally, of course, this is due to a cloudburst or very heavy gale and rain, but not infrequently the crops will lodge without any action by the elements from sheer swollen-headedness. That is to say, their ears will be so heavy that they outgrow the stamina of the stalk, and sag over to one side or other. Farmers dislike lodging because a lodged crop is difficult to mow, or was difficult with the older-type machines, and had often to be cut by men with scythes, a laborious and expensive procedure in these days.

About rotation a whole book, or series of books, might well be written. Rotation results from the recognition that land needs rest. The primitive idea was to hack a plot from the virgin jungle or rough scrub, plant it with corn for two years and then let it revert to the wild. All the early rotational systems provided for at least one season's rest for the land, that is, after two years' bearing, it was not required to carry any crop but allowed to lie fallow. Fields which you may see in early spring with the stubble still unploughed and no clover or lucerne showing green between the bristles will likely be lying fallow. As knowledge grew, it was gradually recognised that, with land as with human beings, a change of work is as good as a rest, and modern systems of rotation are based on this. Historically they have all been developed from the famous Norfolk four-course rotation, credited to the great British agriculturalist,

William Coke of Holkham about 1780 This northerly corner of East Anglia, where the sandy shore faces the Arctic, but the pine trees stand with their feet almost in the water in a manner more typical of the warmer coasts of Southwest France, is one of the cradles of British farming practice The child was a system based on a yearly rotation of crop from turnips (roots), to barley (first grain crop), to clover (grass), then to wheat (second grain crop); and so back to roots again in the fifth year The modern farmer knows this as "wheat, beet, barley, hay"—the sugar-beet having replaced turnips and the hay being that stover or dried clover of which we have already spoken

The importance of this system was that it did away with fallow, making the land do without complete rest, and this principle has been followed ever since, though all sorts of modifications and alterations to Coke's original four-courses have been made Whereas it was once thought heretical if not suicidal to grow two or more grain crops in succession, this has been done not only with impunity but with success To be honest, these intensive methods have not yet been practised long enough and over wide enough areas to provide conclusive evidence of their effect on fertility, but on the other hand, Rothamsted, Britain's world-famous research station, has grown wheat for 100 years, a whole century, in the same field without the soil losing heart





CHAPTER EIGHT

GRAIN HARVEST

HAVING now metaphorically as well as literally cleared the ground, we should have the picture clearly enough in our minds to pass on to a short study of the main crops grown on both sides of the road of British arable farming. Among them wheat must come first, in recognition of its high place among the foods for Man and Beast. Over large parts of the world wheat is the traditional staff of life, and to-day it enters increasingly into the food of animals. The milled flour is the basis of our bread, our biscuits, our cakes and our pastry. The residues of grain go to the making of meals and cakes for cattle and poultry. Wheat is a sunshine crop. We have already seen that, since its roots may reach as far below the surface as its stalks grow above ground, it can flourish with very little refreshment from rain, which is why it is grown chiefly in the drier eastern half of Britain and particularly in East Anglia. Whether you see it standing in a field or inspect it in the ear, wheat should be easily distinguishable on account of its square ear and sturdy carriage. Wheat does not droop and bend like the other corns, but holds itself stiffly and proudly erect. What your eye will not register are the different types of wheat, of which there are dozens. Firstly, there are wheats with the chaff of the head white and others with it red (when ripe one will be amber yellow and the other a shade of copper); and next, wheats with white or red grain. A further division is into wheats with tall or short straws. The possibilities, as you will see, are many. For example, there is a tall white-chaffed wheat with white grain and a short white-chaffed one with white grain; then a tall white type with red grain and a short ditto; and so on and so forth. Of each type there may be more than one breed or hybrid.



WHEAT

Each has a name, and among farming men, Square-head, Little Joss or Vilmorin are as familiar as Madame Herriot, Karen Poulsen or American Pillar are to rose-growers.

There is also a bearded wheat which it is easy to confuse with barley. It has the same long, barbed whiskers, but a closer glance will show the squareness of wheat instead of the slender, flatter barley. It used to be much grown around villages or towns, the idea being that the "beard" gave protection against the hosts of house sparrows which would invade fields so close to their haunts and do great damage, but little is now planted and you may travel far and wide without seeing any. Still, you should be able to recognise it should you come across a field of it, if only on account of its taller straw.

This almost bewildering number and variety of breeds results from an intensive search over a century to produce wheats for all-round purposes—good bread for our tables, the greatest amount of food for animals and plenty of straw for thatching as well as for treading with manure. (Incidentally, only wheat straw is used for straw thatching—barley and oat straws are not firm enough—but the best thatching is done with reeds.) Other special considerations are, for example, for districts where the soil is rich; wheat which will be specially hardy and stand the northern winter, or which makes rapid growth and so can be sown late in the season. These new wheats have both been bred at British agricultural research stations and imported from Europe, particularly from France and Belgium; and have been developed here to give our home-grown wheat the "strength" to hold its own against the cascade of grain which pours into Britain from the great wheatlands of Canada, the United States and the Argentine. It all started many years ago with our fondness for a nice, fluffy, white loaf. Down the centuries we had been content with the firmer and darker loaf made from our indigenous corn, but when grain began to be imported from the New World it was found to make a lighter bread. Every one immediately wanted this new flour, the home-grown product was neglected, and for a time practically all the flour used in British homes was shipped from overseas and milled at the ports where it was landed. That is why you will find big modern mills at the ports, and generally only small, disused or derelict ones in the corn-growing areas of Britain. Banished from the housewife's kitchen, the flour made from British corn was bought by manufacturers of biscuits and poultry foods, and became known as biscuit flour.

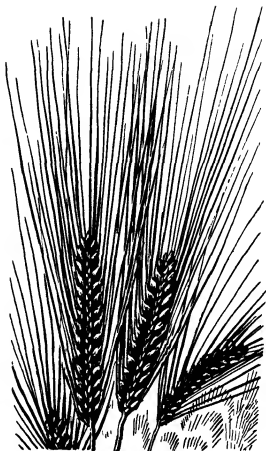
The secret of the New World wheat's success was found to lie in its "strength," which is a technical word meaning its content of gluten. Perhaps, as you pass

a field of wheat you will, like me, almost automatically pull an ear, rub it in your hands to free the grains and then nibble them. If the wheat is one of the native varieties (the most venerable of them still grown are suitably named Squarehead and Squarehead Master) the grain, when bitten, will show a chalk-white kernel; but if it is one of the new varieties developed to counter the imported American flour it will show clear and translucent, which means that flour made from it will rise easily in the baker's oven

To-day there are many breeds of wheat grown on British farms which have gluten contents comparable with the best that the Canadian or U S prairies can produce, which give high yields of grain and will also thrive and ripen in the fickle climate and varying soils of the British Isles Of these hard wheats developed in Great Britain the most used are Yeoman and Holdfast Changing needs and habits have indeed made heaviness of yield more important than quality of grain, and farmers grow increasing quantities of soft, white wheats from Europe which give big returns.

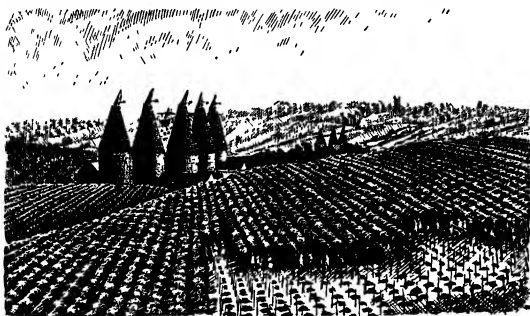
A further refinement which may interest you is that each of these was either deliberately bred to suit, or is by character suited to the needs of different types of land On poorish or light soils Little Joss does well, on poor, heavy ones a variety named Rivet may be successful On medium or middle soils, neither light nor heavy, the farmer will sow either the Dutch Wilhelmina, or the English Victor, and on the heavy fertile soils the English Yeoman or the Swedish Iron or Steel. But, as one of my friends complained, "You never know what to sow You can choose just the right variety and then the weather will mess you up" He went on to instance how he had drilled a field of good land with Juliana which, as a short, stiff-strawed breed, should have done well. The season turned out to be a hot but moist one, and behold! Juliana leapt up to a height of five feet, developed a heavy ear and then, most inconsiderately, lay prone, a shameless "lodger." Had it been an ordinary Suffolk summer, hot and dry, his selection would have been correct, but, as it was, he was put to trouble and expense in harvesting the recumbent Juliana.

Of course these details are not to be read in large print in the farming book.



BARLEY

They are the technical and italicised footnotes and you will have to be something of an expert before you can understand them. At first, the most you will be able to do is to read the headlines, as it were, and to distinguish at harvest-time between the white wheat and red, to pick out Little Joss by its distinctive copper-coloured ear and mauve straw, and to recognise winter corn (though you are not likely to be able to tell young wheat from young oats) by the simple fact that it provides a brilliant green carpet of shoots about an inch or so high in winter or early spring when the neighbouring fields are merely enclosures of dark earth. As my friend, John Peel, has described in his excellent poem of the farming year, "Mere England," the fields are then "palest green where tender pencilled wheat peeps up to quiz the strange new winter world." At a distance you may mistake

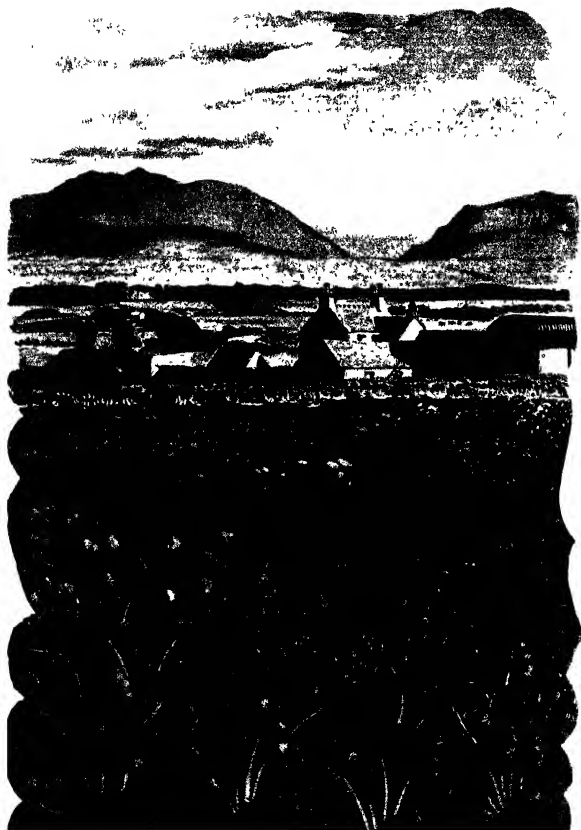


HOP-FIELDS AND OAST-HOUSES, KENT

winter corn for grass until you remember that grass will not normally be of such a vivid green so early in the year.

I have only considered wheat in such detail to leave you with some idea of all the science and study that is represented by those fields of corn which sway and nod on both sides of the road. For what is true of wheat is true, though in perhaps lesser degree, of barley, oats and rye also.

By now you will be able easily to pick out barley. You will look for it chiefly on the light lands almost anywhere on the eastern part of Britain, from Essex up to Fifeshire, on the downs of Southern England and in other places where the soil is suitable. At a distance you can pick it out near harvest-time by its bleached appearance, ripe barley being almost white in colour. Close up it is recognisable by its whiskers, though, as we have seen, it can be confused with bearded wheat and also, as we shall see, with rye. In early spring, young barley just pushing through the chalky soil, like that around Royston, for example,



makes one of the most delicate tints it is possible to meet in Nature, the tender shoots no more than powdering the white with the very palest of greens Barley is far less generally used for human consumption than wheat It is met as pearl barley in soups and broths, but probably it is as an essential ingredient for our two national drinks, beer and whisky, that it is best known. For this purpose it is moistened until it begins to sprout and then dried by the process known as "malting," and it is as malt that we associate it with brewing and distilling You will find big malt-houses usually close to the railway line in the eastern districts of England, Essex, Suffolk and particularly Hertfordshire, and indeed all along the line we travelled from King's Cross to Edinburgh For the brewing of beer, malt is used, together with hops, that peculiar, creeper-like, feathery plant, the growing of which is restricted by law as well as by soil and climate and, generally speaking, is limited to certain areas of Kent, Sussex and Hereford Hops are so much a specialist crop that I can do no more than mention them in passing, though you cannot mistake them as they are trained up high poles and along strings, some eight to ten feet above the ground. The crop is dried in oast-houses, those queer, conical, ventilator-capped brick structures which stud the countryside of Kent and Sussex as the Martello towers line the shore Barley's praise has always been sung in connection with beer Do you remember Tib, the wife of a medieval bishop of Bath and Wells, who was immortalised by her husband in his not-very-ecclesiastical song, "Jolly good ale and old," as one who "Doth troll to me the bowl ev'n as a malt worm should"? That is barley speaking Whisky is produced by blending a spirit which is distilled from malt with another distilled from grain or maize Finally, who is there of us who has not at some stage in life revelled in or revolved at the prospect of a spoonful of extract of malt, with or without cod-liver oil!

Much of the best barley is grown in East Anglia; and malting barley especially is an aristocrat, the old belief which still persists both in brewing and farming circles being that the best barley for this purpose should grow within sight of the sea, so that the shore mists may sweep over it to refresh the plant and swell the ear As a direct food for animals, barley is almost as important as wheat, and barley meal is the finest fattening food for pigs

As you pass barley fields you will soon see even from a distance that in one the awns—as the whiskers are called—will hang down limply; and in another they will stand upright and bristling The former is known colloquially as "hsh" barley, presumably because the limp awns resemble whitebait, minnows or other small fishes, and the other "feather" barley for reasons equally obvious For years the outstanding examples of these types were "Chevalier" (fish) and "Goldthorpe" (feather) To dive into history again for a moment, the origin of Chevalier is one of farming's minor romances About 1820 a Suffolk farm-worker, John Andrews by name, was irritated by something in his shoe as he walked home from the harvest fields When he took off his shoe he found that the offending object was an ear of barley. Acting on some strange impulse, he examined this carefully and registered the fact that the ear and grains were of better shape than usual. Accordingly he put it away, and in due season sowed it in his garden. Much to his joy the little crop reproduced all the shapeliness of

the parent, so again he sowed the seeds, now multiplied, and once again the plants grew true to type. At this stage the Church intervened in the person of the Rev. John Chevalier, the local clergyman, who begged some of the seed and sowed it as a field crop. Again it stood the test and when harvested reproduced all its original qualities, with the result that it first became a local favourite, and then its fame spread until it was established on a national scale as a superior type of barley. Very unfairly, it seems, Chevalier thus perpetuates the name of the clergyman who no more than recognised a good plant when he saw one, instead of the humble farm-worker whose inspiration and patience had produced it.

From these old-fashioned barleys were bred two new varieties which gave heavier yields of grain, Spratt-Archer, as its name implies, was an improvement of the "fish," and Plumage-Archer, a corresponding development of the "feather" type. To-day there are a variety of new breeds and hybrids developed to give higher yields combined with stiff short straw to prevent them lodging so readily.

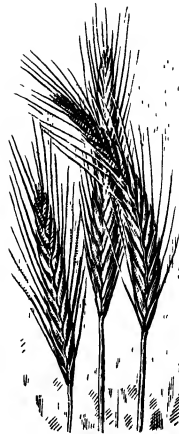
Oats were defined by the great Dr. Johnson in his dictionary as "a grain which in England is generally given to horses, but in Scotland supports the people." Lord Elibank is said to have met this with the retort, "True! and where will you find such men and such horses?" For all its offensiveness to Scotsmen, Dr. Johnson's observation does summarise the use of oats, which are, of course, peculiarly the food of humans and horses. They are familiar to us all in our porridge, in oatcakes and biscuits, and as the raw material of some of the more mysterious of our breakfast cereals, as they are also, of course, the staple food of horses in the form of crushed oats.

Oats are readily recognised and are far more generally grown than barley. Indeed, there is practically nowhere in the British Isles where oats will not grow, though, as I mentioned earlier, there are districts in which they will not ripen. Since porridge is one of Scotland's notable contributions to the human diet, it is not surprising to find patches of oats even on remote shielings tucked away in the mountains of the Highlands. Like barley, oats are of two main types, unlike barley, these are not distinguishable from a distance. There are, of course, black breeds of oats and white breeds, and these will be fairly easily recognised as the husk of the one is dark, almost black, in contrast to the yellowy-white husk of the other. Another distinction is that some belong to the one-sided and others to the all-round ear type. That is to say, the heads of grain may all hang from one side of the straw or form all round it, and this is something which you can only see by a close-up inspection. I imagine, though, that once you are sufficiently interested in the arable crops you will come naturally to pull and examine the ears, even if you are able to resist the temptation to bite or eat the grains. Nowadays there are a number of breeds which are grey in colour, and which have been developed so as to combine hardness with heavy yields. Of course, it is only the husks that are of different colours; the kernels of all are white, and I personally find a fascination in a heap of crushed oats piled against a granary wall, the husks split, so that the effect is a mosaic of shining black husks and powdery white grain.

Rye is the least familiar of British grain crops. It is in a sense the poor relation



OATS



RYE

of the others, a plant which is grown in poor soils by poor people. For that reason, although common enough centuries ago, and in the poorer regions of Europe to-day, it passed out of favour for many years, and was little grown until the need for bringing more acres under the plough resulted in land being broken up and turned over to grain crops which was not rich enough to support wheat, or even oats. Rye was then chosen because it is a better crop for direct human consumption than oats. It closely resembles barley but is easily distinguishable from it because it will be in the ear weeks earlier than any other grain.

Through the months of spring and summer the grain crops grow to ripeness, but the transformation is so gradual that if you are fortunate enough to be able to look out day after day over grainland you will scarcely perceive it. For a week or more there will seem to be no movement, then almost overnight the change will be there. The short grass-like shoots of April and May thicken into plants which, though still green, are stalky and no longer to be mistaken for grasses. In the next stage the stalk is taller, the green has lost its vivid edge, the ears have begun to form but the grains are soft and milky when bitten. From then on to harvest the crop ripens, the ear fills and hardens, the colours change to a range of chromes and ambers, and the stalks, now straw, rustle and

chatter in dry, excited whispers as the breeze stirs them. One of the magic sounds of the farmlands is the ticking of a field of barley under the blaze of a July sun. At first you may perhaps think this ripple of sharp cracks and pops is the work of the insects, especially as it may go on to the accompaniment of the faint threedling of the basking grasshoppers, but it is no more than the corn announcing its near-readiness for harvest. In due season, the miracle happens and the seeds, sown in the wet, wintry soil, multiply themselves in the hot, bursting crops of harvest home

Although grain is only one of many of our arable crops, it is the one specially, and indeed solely, associated with the word harvest. All must be gathered in, in their season, but there is none of the glory and the mystery about the gathering of the others that there is of wheat and barley, oats and rye. And no matter that these other crops, the turnips, the potatoes, the kales are still standing, this is the crown of the farming year. What follows is in the nature of anti-climax, a necessary drudgery after the last cart has left the stubbles and the last sheaf been piled into the stack. For the explanation you must peer back into the mists of antiquity, to the days when the world was young and the grain harvest was in all lands a religious rite as well as the great agricultural occasion, and also consult your own feelings as you contemplate the busy scene, the fields shimmering in the sun, the crispness, the dustiness but the cleanliness of it all, the sounds of clacking reapers, of whirring tractors, the grunts of sweating horses, the calls of their drivers, the shouts and cries of children armed with sticks as the island of standing corn gets smaller and smaller and terrified rabbits and hares bolt hither and thither, as your nose registers the warm, wholesome smells of hot leather, bruised plants and trodden earth. This is a time of hard work but of rejoicing. Those who work on the land and recognise the essential connection between the sheaves in the field and the bread on their tables, unconsciously register the true meaning of the harvest, a meaning which, the pity is, is lost on all who only see in it a spirit of carnival, who note the gladness but not the reason whereof. True, the occasion is celebrated in the towns and cities to which the scents and sounds of the harvest field do not carry and where the dwellers in flat or tenement or the scurrying throngs on the hot August pavements pause but seldom to think what it means to them. Yet the churches are decorated with flowers and piles of fruit and vegetables, hymns appointed for the festival are sung and an appropriate sermon preached. In each village, too, the service of thanksgiving will be held, the differences being that the decorations will be more suitably products of the fields and the congregation will need no exhortations from the pulpit to make them comprehend its significance. These are the formal celebrations of the Christian Church, but in most rural districts the farm-workers will mark the end of harvest with some sort of feast, whether it be the horkey of East Anglia, or the mel of Northumbria; and also by certain ritual observances which are survivals from a pagan and primitive age. In some districts they will make a "corn dolly," a crude effigy of straw which is set up over the barn or granary door; in some they are at pains to see that the last sheaf, or a bunch of full straw from the last sheaf is put out for the birds; in some a green bough is cut from a tree and laid on the last load to leave the fields.

The field work of harvesting consists of cutting the grain, and then of ensuring that it is thoroughly dry before carting it off to the stackyard. The general practice is that as it is cut it is tied into bundles or sheaves, which are then piled into stooks so that the sun and the air can complete any drying that may be necessary. In due course the stooks are gathered up and the sheaves carted off the fields to be fitted into stacks either in or near the farm buildings. Barley in a dry season may indeed be carted straight off the field without being allowed to dry off in stook. Oats, on the other hand, must be given a good long period of drying. The old rule is that they should hear church bells ring three times, that is, they should be left in stook for three weeks between cutting and carting.

There is need for expert skill and experience in fitting the sheaves into the heap in such a way that the stack stands four-square, trim in appearance and firmly on its foundations. Many stacks, the old hands say, far *too* many stacks, will be lopsided, as you will observe, and some even need to be propped up with poles to stop them toppling over. There is also need for expert skill and experience in thatching the stacks, for each must be covered by a thatch of wheat straw to keep out the rain and snow of winter. The stacks stand out in all winds and weathers, until one day the threshing engine comes, with its brass horse prancing bravely on its plate, its black-faced driver and his load of coal, to complete the cycle of seed-time and harvest by separating the grain from the rustling bones of the plant which bore it. With the engine—and nowadays a small and un-beautiful stationary tractor will often do duty for the noble, black steam-engine which looks like the half-sister to a steam-roller—will come the lumbering threshing machine; and its attendant elevator. The engine and thresher will be coupled up close to the stacks, whether in the farm's yard or corner of a field. Men standing on the stack pass the sheaves with two-tined forks, or pitchforks, to other men who cut the string binding the sheaves and feed them into the machine, the grain running out at the tail of the machine into sacks. At the opposite end, the empty, threshed straw will be made into another stack, so that as the one stack slowly wastes the other rises as the elevator with its endless chain of teeth carries the straw up to men who pitch it into proper shape. For a little while, a few days at most, something of the urgency and bustle of harvest returns. The stackyard is a scene of ordered animation, each man fitting into the picture with the ease of training and experience. Against the sky the pitchers on the stacks work with an unhurried rhythm, which contrasts sharply with the excited movements of those on the ground, the foreman shouting orders, the comings and goings of the men loading and carrying the sacks, the alternate lolling and shovelling of the engine-man and his mate, and ever and anon the flailing rush as the rat-catchers, professional and self-appointed, fall on the rats which bolt squealing from the stacks. All this action goes on to the orchestration of the throb of the engine, the bass hum of the thresher and the rattle and click of the elevator. The air is thick with flying dust-motes and particles of straw, which sparkle as the sunlight picks them out. So twelve months or more from the day it was sown, the wheat, or oats, or barley, at last leaves the farm for the mulls, there to be ground into food for the nourishment of Man and Beast. If

on paper it is a tale soon told, it is a long, sometimes exciting and often desperate story for those who, from day to day, assist in its unfolding and whose livelihood turns on seeing that it comes to a successful climax

What of the tools required? In the beginning, of course, crops were cut by hand, first with sickles or reap-hooks, and then with the more effective scythe, which needs strong hands and arms and which soon pulls the belly out of the man whose muscles are slack or who has not the skill to wield it. In these mechanised days it is indeed worth remembering that up to little more than fifty years ago the farm-worker and his scythe were responsible for reaping the entire harvest. Even now hand-reaping is necessary round the edges of the fields or headlands, as they are called, to cut a way by which the tractor and reaper can enter, and also, as we have seen, where a crop has lodged badly. Then the reaper was developed, a spindly contraption with whirling arms and an eager clack, which, pulled by a horse, cut a broad belt of grain and laid it in an orderly swathe on the ground. The old reaper was ousted by the reaper and binder, which, as its name describes, not only cut the grain but tied it into sheaves and threw them out, so that all the men had to do was to pile them into stooks. The next stage, into which British farming is entering to-day, is personified by an innovation from America, the combine-harvester, a formidable and complicated piece of mechanism which, for some reason, always makes me think of a cinema organ, and which cuts and threshes the grain, and fills it into sacks, leaving the men who work it merely to tie the mouths of the sacks. You are bound to recognise it without any attempt at description by me, merely on account of its vast size. The straw is left in swathes on the ground, and in some districts will remain until it is burnt where it lies. That is why you will pass stubble-fields smoking with lines of fire. Others you will see are littered with compact blocks. The former will mean that the farmer has so much straw that he has deliberately set fire to some as the easiest way of disposing of it—a very wasteful process in the general interest, because there will surely be other districts where straw is wanted. The problem, of course, is—could straw, which is a cheap material, be gathered up and transported there economically enough? It has another aspect. Burning straw is reducing the amount available for humus and must, if widely practised, ultimately affect the fertility of the soil. Those wooden-looking blocks are bales of straw, and will tell you that the combine-harvester has been followed on the field by a mechanical baler, which comes along, picks up the swathes of straw and turns them out in these uniform, rectangular bales, neatly tied with twine or wire, all ready to be piled into heaps like a child's bricks, without the need for any skill or training.

Combine-harvesting and baling represent a giant stride in the mechanisation of harvesting, but there will be many who see in it only the death of rustic craftsmanship. In the past the making of a corn-stack has been a test of the craft of the farm-worker, a test of his knowledge, his experience and his aptitude for his job. It involved first the tying of uniform sheaves, then laying them in at the correct angle required for each layer in the stack, and finally of thatching the stack so that, four-square to the winds and impervious to the rain and snow of winter, it would stand with its grain undamaged until threshing day came

round The making of a really sound stack was then something of an accomplishment, something of which even the most expert farm-worker was proud But nowadays, with the standard quadrilateral bales of threshed straw, stack-making is no more than setting one child's toy brick on top of another Look about you as you go and you will see many of these newfangled stacks, particularly in the eastern counties They look angular and odd, but at a time when it is the result which counts, the box-of-tricks stack is far easier and quicker to build, and does not demand skilled labour

The same is true as regards shepherding One of the tests of the skilled shepherd was his expertness in setting up the strong, snug, straw-built enclosure, reminiscent of some medieval fortified encampment, which provides warmth and shelter for his ewes at lambing-time Nowadays, any one can build with straw bales a wall stronger and more wind-proof than any made of loose straw, no matter with what craft and artistry it is woven Already such walls of straw bales have been given a coping of cement which converts them into semi-permanent structures And alongside these strictly practical uses there are other possibilities

One hot evening in August, 1946, I was motoring from Bury St Edmunds towards Diss when my eye was caught by a number of children sitting on some straw bales in a field which had recently been combine-harvested This was odd, because the field was nowhere near a village, indeed, there were only two cottages in sight As we drew nearer I saw that the children were sitting, huddled and expectant, on bales which had been arranged in a semi-circle round another arrangement of bales Our curiosity at what they were looking at turned to astonishment when we realised it was a Punch and Judy show, a very primitive one that some unidentified benefactor—some German prisoner-of-war maybe—was giving in a booth of straw bales and with puppets that were no more than his hands thrust into grey socks The wonder to me was the imagination which had suggested such possibilities in unpromising material

Along with direct changes, the adoption of combine-harvesting may have other and more far-reaching consequences If it becomes standard practice it will pose the major problem of how to store the threshed crop Up to now grain has generally remained in stack until gradually threshed and sent to the mills, but if in the future it is all to be threshed on the field at harvest-time, there will be an all-submerging flood to the mills in August. New storage accommodation will thus obviously have to be provided, either on the farms or at the mills

Before we take leave of the crops which symbolise the Staff of Life, you may be interested to learn the weight of grain the farmer may expect to harvest from an acre of land Up to quite recently grain has been weighed in old-fashioned measures known variously as bushels, coombs or quarters. These are measures of bulk as well as of weight, so that a bushel of oats—whose bulk in relation to weight is the highest of the standard grain crops—should weigh between 38 and 44 lbs., whereas a bushel of barley should weigh from 54-58 lbs. and of wheat 60-64 lbs. The truth is that these measures followed different sets of tables in different districts, with every opportunity for misunderstanding and confusion, so that to-day weights are officially standardised in hundredweights, although

the use of the older measures persists among farmers and agricultural merchants.

An average weight of wheat from one acre is about 36 cwt., unthreshed; or roughly 18 cwt. of grain and 18 of straw. A good yield of grain is of the order of 27-32 cwts, but the best farmers must aim for something even above this figure if the average yield for all farms is to be raised satisfactorily. There must be returns well above 32 cwts. to compensate for the very low figures reached by the men at the lower end of the scale. On good soils and with the right methods 35-40 cwts of grain are well possible, though exceptional. The average for barley is about 16 cwts of grain, and of oats about 15 cwts., good yields being at least double these figures.

As we have seen, the result will depend ultimately on soil and weather, but more directly on the farmer's skill in managing and fertilising his land. And considered in terms of loaves of bread, the difference between, say, 35 cwts. of wheat an acre and 15 cwts will be roughly 1,200 loaves as against 500. Thus is the efficiency of the farmer reflected on every breakfast table throughout Britain.



CHAPTER NINE

THE GREEN CROPS

THERE remain the less romantic crops of arable farming—roots, kales, cabbages, potatoes, peas and beans, and the varied list of specialist and near-market-garden crops.

The main root crops are turnips, mangolds, swedes and sugar-beet, though there are, of course, others like red-beet or beetroot, kohlrabi, and parsnips, which scarcely qualify as farm crops proper. They, and indeed all arable crops, are cultivated by the same general methods as grain. The important difference with roots and the kales and cabbages and others is that the gaps between the rows in which they have been drilled will need periodical clearing of weeds, either by hand-hoeing or, more usually, by horse-drawn or mechanical hoer. When the crop begins to come through in crowded rows of tiny plants they will need thinning out or “singling” by hoeing, a gap of about nine inches being left between one plant and the next. This work must be done by hand. It is one of the farm jobs which can only be performed by the human brain directing human muscles, and is still beyond the scope of any metal robot, however ingenious or accurate.

As you pass along any country road in almost any part of Britain you will see roots either growing, or scattered on the fields and pastures as food for cattle and sheep. Turnips and swedes you will meet in the wettest district of wet Wales and in the lowlands of North-west England and Scotland, as well as on the flat lands of the Fens, the rolling grass country of the Midlands or the dry soils of East Anglia. Mangolds are usually a south-country crop, and sugar-beet is still more choosy and needs a rich soil. It is restricted to certain well-defined areas, particularly the Eastern Counties.



MANGOLD

It will not be easy at first to distinguish one root crop from the other. From the road, or at a distance, turnips will appear a dull, light green. Seen closer, the leaf will be crinkly and the top of the root which shows above ground either green or purple. Mangolds or mangold-wurzels have a larger, more wavy and glossy, dark-green leaf, which, on closer inspection, will show red or yellow ribs. Unlike the turnip, the greater part of the root grows above ground and may be of three different shapes — globe, tankard and long, terms which explain themselves — and three different colours — red, orange and yellow, the top being red or purple. Swedes are easily distinguishable from afar because their foliage is a dull, blue-grey; the root, familiar to all as a shade of pinky-orange when mashed as a vegetable, may be either green, purple or bronze at the top. Lastly,

sugar-beet has a glossy green leaf, not unlike that of the mangold, but usually of a lighter shade of green and with white ribs. Its root is distinctive. It will show green at the top, but instead of swelling into a round globe below ground, it thrusts down in one, two or more prongs, like a parsnip. It is dirty white in colour and will be familiar to most wayfarers from the heaps piled by the roadside in autumn waiting to be taken to the factory to be pulped and the sugar extracted.

To summarise, a field of turnips will be identifiable as so many acres of dull, light green, mangolds a dark glossy green, swedes blue-grey, and sugar-beet glossy, but with white ribs in the leaves. That alone emphasises the richness and variety of colour in the patchwork quilt of arable farming. You have only to imagine a countryside in which fields of, say, swedes and sugar-beet are scattered among others of young wheat, mustard, sainfoin and potatoes, where the clashes of colour blend into one of Nature's most beautiful harmonies.

A substantial acreage of roots is each year laid down for seed in districts where the soil and climate are suitable, chiefly in the Eastern Counties. The plants are allowed to flower and so to produce seeds which are harvested for next year's sowing. When you see in the distance a field of pale yellow, your first deduction may be that it is mustard. It is more likely to be turnips in flower, but you can tell at once from near to, because the mustard will show as a compact crop of dark green leaves, and the turnips a rather straggly one of taller, less densely growing plants already beginning to change their greenery for a

sere coat of grey and yellow A warning here At a distance a dirty field of grain, full of the baneful charlock, will show much the same shade of yellow, and indeed even from a close-up view, charlock and turnip flowers are much alike By now, however, you should be able easily to tell t'other from which by noting the crop the field is supposed to be growing, charlock will show clearly as an invader among the grass-like shoots of the young grain. Swedes are less colourful and their flowers white and less conspicuous, while mangolds and sugar-beet have no flowers worthy of the name, but merely stretch long necks upwards into shaggy green heads These flowers can be seen in any field of mangolds or beet in early autumn Gone by then are the uniform gloss, colour and height of the growing crop The shine on the leaves has dulled, and the green begun to turn to white and yellow, and through them, every yard or so, a plant has "bolted" and shot up perhaps two feet above the others.

The interesting fact about the roots is that they are aliens, imported into Britain within the past 200 years To appreciate the part they have played in our farming scheme it is necessary to remember that in olden times, when the only winter food for stock was the hay that the farmers had been able to make in spring, most of the cattle and sheep had to be slaughtered each autumn, as only the bare minimum of animals could be kept alive in winter Most of the meat eaten during the winter months was salted Then the turnip was introduced from Holland. Its development is permanently associated with the name of Lord Townshend, another Englishman who ranks among the world's great agricultural pioneers, and the significance of whose achievement was recognised even during his lifetime so that he was known as "Turnip" Townshend by his contemporaries. To be strictly accurate, turnips of a kind were cultivated in British gardens before Townshend His achievement was rather to develop the field cultivation of the better type which was being brought in from Holland. This was a big step forward as it filled the dangerous gap that had up till then existed in the winter feeding of farm stock, the new turnips providing an excellent maintenance ration for the dark days They were soon found to have one serious disadvantage They were ready victims to "the fly" or flea-beetle, a minute black and yellow insect which arrives in its myriads and can strip a whole field of tender, young turnip plants overnight. Even to-day, with all the aids of modern science at call, "the fly" is still a



TURNIP

danger to be reckoned with, and until recently, farmers had no effective protection against it. No matter that they tried the most ingenious methods of foiling the enemy—including soaking the seeds in brimstone, dragging the fields with elderbush or even scattering putrefying lobsters on them “to leave effluvia”!—they might plant their turnips two and even three times and still

“the fly” would carry them off. Well was the prevailing attitude of mind expressed in the old Wiltshire song.

*for the fly, the fly, the fly
be on the turnet
and it's all me eye for we to try
to keep fly off the turnet*



SUGAR-BEET

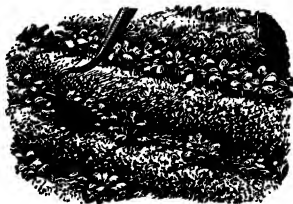
In 1786 the mangold was brought in, coming, as the wurzel part of its name might suggest, originally from Germany. After a period of experimentation in which it was tried without success as a food for humans, it established itself as another valuable addition to the farm's winter menu, especially as it was found to be immune to “the fly.” To-day it is probably the most important root crop grown on English farms for feeding to stock. In the early nineteenth century the swede was brought in from Sweden. Unfortunately it shares the turnip's vulnerability to “the fly”; and though cultivated in certain districts, particularly in Lancashire, as a vegetable for our tables, it is, generally speaking, less extensively grown on British farms to-day than a generation ago.

Considered solely as farm crops, turnips, mangolds and swedes are grown primarily to feed farm animals—the turnips and swedes we eat as vegetables are mainly the product of the market-gardens—mangolds being used only for stock feeding. The harvesting of the three crops is interesting, as each differs slightly from the other. The one thing common is that all are lifted by hand labour. Turnips are not harvested in the accepted sense of the word, but are allowed to remain in the ground, being pulled out as required and

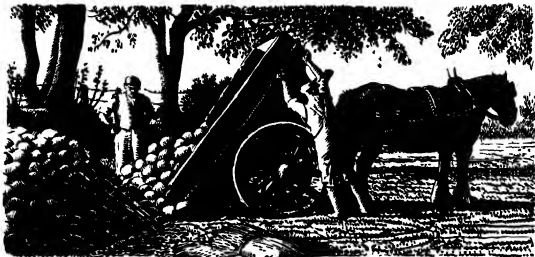
scattered about in stockyard, meadow or field with their leaves on. Mangolds, unlike turnips, are gathered in from the fields and must be stored. Unlike turnips again, mangolds have no neck, the leaves growing straight out of the root. To slash them off by rough and ready methods would involve the risk of cutting part of the plant which will bleed like a beetroot, so the leaves are usually either twisted off by hand or very carefully taken off with a small knife.

Mangolds are stored in one of those long, earthen mounds which you will see in the fields of almost any farming district and which go by the names of clamps, pits, burys, hoggs or pies, according to the locality. These are made by first digging down a foot or so into the earth, and laying down a layer of straw on which the mangolds or potatoes are piled like the cannon-shot in those old prints of the Crimean War. They are then covered over with straw, and finally with a thick coating of earth. If the work has been well done the crop should keep wholesome throughout any but the severest of winters. The straw and earth will keep out the frost, and such rain as penetrates will drain away through the straw-filled sump. The earthen jacket makes an excellent insulator which also keeps out the heat, and thus prevents the stored crop from sprouting. Swedes may either be clamped like mangolds, or fed direct, like turnips; but as they have a neck there is no risk in slashing off the leaves, which is necessary because these are never fed at all. They are left where they fall, to rot down or be ploughed in for humus.

Sugar-beet stands in a place of its own and must be considered apart. First, it is relatively a new crop in the British farming scheme, having been introduced from Belgium and Northern France no longer ago than 1905. Secondly, although it provides valuable food for animals, this is largely as a by-product to the main purpose for which it is grown—to provide sugar for domestic and industrial uses. Thirdly, the methods of harvesting the crop and feeding the by-products are peculiar to it. It is, I feel, an unlovely vegetable, but equally it is to-day both the most valuable and the most grown of the roots. Yet for many years it had to struggle for a foothold against those who argued that it was a gross feeder which would take the heart out of the land, as well as against the small



GAPPING OR THINNING TURNIPS



CARTING MANGOLDS TO THE CLAMP

but vocal old guard of farmers who resist all innovations because they are innovations. The efforts of a few enthusiasts ensured that it was given a trial, and in 1912 the first commercial factory in Britain was built at Cantley in Norfolk. Nowadays the British Sugar Corporation controls eighteen factories, fifteen of which are in the East of England, two in the West of England and one in Scotland, and these produce roughly half a million tons of sugar a year from British soil. This may come as a surprise to those who, as I did, grew up with the idea that sugar is an exotic, the harvest of plantations in the Americas. There could indeed hardly be a contrast sharper than that between the two methods of growing sugar, on the one hand the traditional plantation scene, tropical sun and purple shadows, and the tall, yellow canes falling before the heavy knives of sweating, grinning, cotton-clad negroes, on the other, leaden, rain-swollen English skies, and acres of muddy, puddled fields over which move stooping men, wool-muffled and rubber-booted against the cold and wet, picking up the dripping beets and slashing off their tops. Somehow the sugar itself seems to reflect that contrast: the beet yields no black molasses, no golden treacle, no honey-coloured Demerara. It is just white, sweet certainly, but plain and utilitarian by contrast with the product of sunnier lands.

Because sugar-beet is both such an important crop and presents such difficulties to the farmer, it has probably already been the subject of more research and attention than any other. First you should know that the farmer grows sugar-beet under contract to the local sugar-beet factory. The factory knows accurately the total acreage planted in its district, and as the crop begins to ripen about September, will, early in August, ask farmers to give an estimate of the tonnage of beets they will have to send in. As soon as these estimates have been received and studied, the factory issues to each farmer a permit to deliver his tonnage in equal amounts each week while the beeting season lasts. Some time in September the factory will open to receive deliveries and stay open until all the beet in the area has been processed: that is up to the end of December or mid-January in

a normal year, or even into February in a hard winter. During this period the factory and the district around it will hum with energy by night and day. Some idea of the organisation necessary and the work to be done will be gleaned merely from passing near a beet factory during the season. At Ely, for example, where the factory is sited on the railway line, you will see score upon score of goods wagons full of beet waiting in the sidings. At Bury St Edmunds, where it is served mostly by road transport, there will be lorries of every make and age, piled high with beets secured under pig-netting, shuffling in mile-long queues along the roads leading to the factory—and how cold and grey is the scene, the drivers sitting patiently at the wheel, or shifting wearily from one leg to another as they stand and while away the long hours with a smoke and a talk.

The farmer thus knows when he must have his crop ready—the difficulties lie in getting it ready, and it is to help him overcome these that so much thought has been given to the problem. Remember that in the back-end of the year, and certainly in winter, the fields which were dry or loamy will be heavy, wet and sometimes waterlogged, subject to sudden frosts and thaws. Out of this sodden, clinging earth, into which a man may sink to his knees and a heavy vehicle get bogged for days, the farmer must pull his beets, slash off their leaves, cart them to the roadside and there pile them in vast heaps to await the lorry which will take them to the railway station or direct to the factory. He has little opportunity for choosing his weather. He knows that if he takes advantage of a dry spell too long before his appointed days, his beet may either wilt or get frosted, and so lose some of the sugar content by which his profits are measured. On the other hand, if he temporises, he may find conditions near the date so bad that he cannot lift his crop.

The general method of harvesting still in practice combines mechanical and hand labour. First the beets are ploughed out of the ground—by a tractor if the going is good, and by horses if it is bad. The plough is followed by a man, or men, who walk up the rows of ploughed-up beet, take a root each from two rows, knock one against the other to loosen the soil, and pile them into one new row, so that four ploughed rows become one new piled one. This is to expedite the work of the slashers who come afterwards, pick up the root in one hand and cut off its top and leaves with the other. These tops are left on the ground, where they may lie and sheep be turned in to eat them and



TOPPING SUGAR-BEET

mash the ground up into the pulpy mess I have described earlier; or they may be collected to be fed to cattle in yards: or made into silage for feeding later in the year, or ploughed in for humus. They are an additional nutritious food at a difficult season, a disadvantage being that their rank flavour may be passed on in the milk of cows which are given much of them. The next step is for the beets to be loaded into carts or lorries, according to the state of the field, and dumped by the roadside; where they stay until once again they are loaded into lorries for transport to the factory. If there is a cold spell they will be covered with straw to protect them from frost-bite.

It is clear even from so brief a description that sugar-beet is a crop which makes heavy demands on the farm's labour. It is tiring, dirty and dangerous work, involving the men working for hours on end, bent nearly double, often soaked to the skin by chill rain, and with fingers so numb with handling the



HAULING SUGAR-BEET FROM FIELD TO FACTORY

icy beets that they are frequently slashed as well as the tops. Also a relatively extravagant number of workers are needed to hoe, single, plough, pick-up, slash and cart. If the number of these manual jobs could be reduced, substantial economies in time, labour and expense would be effected and the efficiency of the farm increased thereby. This necessity has been the mother of invention, and on both sides of the Atlantic first-class engineers have been busy for years evolving a reliable machine to replace the man. Already a number are in existence which, on the same principle as the combine-harvester, plough the beets, pick them up, top them and pass them out in one row all ready for carting. And weird and wonderful they are, reminiscent of some of those ridiculous contraptions popularised by Mr. Heath Robinson. I cannot describe them because, so far, there is no standardisation but only astonishing variety. Should you see one at work, you cannot fail to identify it simply by noting the task it is performing. Such an *omnium gatherum* apparatus must necessarily be a weighty affair, and



weight is the main obstacle, for, as I have said, beet must be harvested when the fields in Britain are normally soft and often soggy. A heavy machine, even a 3-ton lorry, may easily get stuck, and, of course, wet mud is apt to clog the most efficient machine. It is therefore good to know that the problem appears now to be near solution, and better still to know that the most satisfactory machine is all-British in design and workmanship.

The story is not ended when the crop has been safely unloaded at the factory, for then the farmer will be anxious to know what percentage of sugar has been found in it. This sugar content, like all other things about all farm crops, will rest on soil and weather and on the skill and care with which the farmer has cultivated and fertilised his land. A good yield of beet from an acre is 14 tons—the average being rather of the order of 8-10 tons—and 18 per cent is a good sugar content, the average being around 15-16 per cent. The basis of payment



SUGAR-BEET FACTORY AT HARVEST TIME

is roughly that if the beet is found to contain sugar above 15.5 per cent, the farmer is paid more for each percentage point, and less for each percentage point below that figure. There is therefore a strong incentive for him to do his land well and earn the higher reward.

Nor is the utility of this versatile crop then exhausted. When it is taken into the factory it is thoroughly washed, sliced into fine shreds and pulped under high steam pressure. The sugar extracted, the residue is dried and forms a valuable food for animals of all kinds. It is an odd-looking, grey substance, very light in weight, which swells when soaked with water. It must therefore only be fed after thorough soaking, otherwise it would swell inside the animals, and in the sugar-beet-growing areas it is relied on as an important part of the winter stock ration. Dairy cows and bullocks alike eat it, pigs get it in their swill and even the cottager's rabbits thrive on it. Farmers are allowed to buy the pulp in proportion to the amount of beet they have delivered to the factory.



MARROW STEM KALE

The next arable crop to be considered are the kales and cabbages. For all practical purposes, their cultivation follows the same lines as the roots, down to singling and hoeing, and any differences in harvesting and feeding are of degree only. You will see both kales and cabbages growing on farms almost anywhere in the British Isles, from John O' Groats to Land's End, from St David's Head to Yarmouth. Some of these will be recognisable at once as familiar friends of the vegetable garden—cauliflowers, savoys, broccoli and brussels sprouts—and that is where, more properly than on the farm, they belong. By this I mean that though the farmer may grow a field or more of one or other of them, he does so in order to market them for human consumption, and not as part of his farm economy. The members of the family which are normally grown in Britain for farm use are three types of kale—marrow-stem, thousand-head and hungry gap, two cabbages—drumhead and oxheart; and rape. Marrow-stem kale, as its name implies, is distinguishable by its fat, fleshy stalk. It is a heavy, gross cabbage whose leaves sweep upwards like those of a cauliflower, and which may reach a height of four feet on good land. Thousand-head kale is a shorter plant and, again as the name describes, branches out from a much thinner and less conspicuous stalk into a profuse foliage, much after the manner of sprouting broccoli, the leaves being smaller and more numerous than those of the marrow-stem variety. If these two bear names which describe their appearance, hungry-gap describes the crop's function, it fills the hungry gap which faces farmers in March and early April, when the stored winter rations have been eaten and the spring grass has not yet reached a sufficient growth. Marrow-stem and thousand-head are sturdy plants and will stand, as you may see them, valiantly in the fields through the chills and winds of autumn, like close-ranked,

dwarf forests With the onset of real winter, with its searing gales and bitter frosts, their life draws to its end, and their succulent leaves, which have been eaten with relish by milch-cow, bullock or sheep, wither. This is when their hungry-gap cousin comes into its own It is the hardest of the family and nothing that a normal winter can do will affect it The coldest period of our year is that from January to mid-February The shortest day is past, and "as the day lengthens, the cold strengthens", but hungry-gap manages to come through with its succulence unimpaired, ready for cutting when all else has either died and been swept away, or has not yet grown to maturity These kales are all left in the ground, and cut, as required, to be fed to stock either in the fields or yards. They are very nourishing, that is, they have a high protein con-



CABBAGE FIELD

tent, and so can be fed as an important part of the production ration to dairy cows.

The two principal farm cabbages are identifiable from their names, ox-heart very large and round, and drumhead having a flattish top They are much alike, though perhaps a field of drumheads will show a pinky-blue colour This may cause you to think they are a paler kind of the red cabbage which is grown in gardens, but in Britain is seldom eaten except as a pickle, which is a great waste of a good vegetable. On rich soil ox-hearts of up to half a hundred-weight are not uncommon. Both these cabbages are grown primarily for feeding to sheep—and are consequently more likely to be seen in sheep-rearing districts—and are fed either cut and scattered on the field, or by the sheep being folded on them.

Rape is the smallest and most insignificant of the family, the plants reaching a height of no more than six to eight inches Unlike the rest, which are singled and encouraged to develop to full maturity, rape is allowed to grow like any

grain crop, one plant vying with the next for light and air. The result is that a field of rape looks very like one of swedes or turnips, and indeed rape is a distant relation of the turnip tribe, though it makes no such fat roots. It does best in a cool climate where there is less danger of the mildew which comes as a result of hot weather in spring, so you are more likely to come across it in the north. It is grown mainly to be eaten off by folded sheep, but must be fed with care, as too much of it can cause a kind of poisoning.



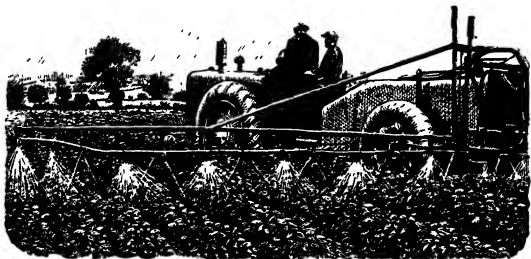


CHAPTER TEN

OTHER ARABLE CROPS

AS potatoes are grown in every vegetable garden or allotment plot, they should need no describing. They are conspicuous on both sides of the road almost anywhere in Britain; in summer, when they are gay with flowers of white or mauve, and in autumn, when the crop is ripe and the tops, or haulms, as they are called, have withered and yellowed. Potatoes are the most important arable crop grown almost entirely for use off the farm—as vegetables for human food or for making into alcohol. The plant was one of the first agricultural importations from the Americas, being brought over in the early seventeenth century; but, in England, for some reason, it remained a garden curiosity. In Ireland, on the other hand, it soon acquired the status of a farm crop, and it was from Ireland that it was introduced, about 1750, on to Lancashire farms, whence it speedily spread all over England and into Scotland, and Wales.

The real development of potato farming dates from about 1870 and has been mainly due to the inspiration and efforts of practical growers, as opposed to agricultural scientists and research workers. The first potato literally to make a name for itself, that is, the first generally recognised pedigree plant, was called *Magnum Bonum*, and was produced by a Hampshire farmer of the name of Clarke. Scotland then took a hand in the work, in which it has been pre-eminent ever since. One of the great pioneers was Archibald Findlay of Auchtermuchty, the originator of *Up-to-date*, and the better known *Majestic*, and his mantle has since been honourably worn by men like Donald McKelvie, who evolved the famous *Arran* breeds. Trained as a chartered accountant, McKelvie, when



SPRAYING POTATOES

already in his middle age, became interested in potato culture, in which he began experiments at Lamlash in the Isle of Arran. His success was outstanding. Eight times during the next forty years he won the medal for the best new variety of potato, his first award being in 1919, with Arran Comrade, and his last with Arran Viking in 1945. An astonishing fact is that he produced the latter after becoming almost blind. The pink King Edward is, as it were, a by-blow, having been raised by a Northumbrian gardener whose name is not even recorded. As a result of these many years of selective breeding, there is to-day a comprehensive range of potatoes to suit all sorts of soils and purposes. They are grouped into the earlies—those which in Britain appear as “new” potatoes in June or earlier, the middle-earlies or seconds, and the main crop, which is harvested in September and October. An interesting point is that breeds of potatoes tend to last for no longer than twenty-five years, after which they begin to die out. The best example is El Dorado, which created such a sensation when first produced that for a short time it was literally worth more than its weight in gold, yet in a short six or seven years the breed had ceased to be, killed by the many diseases to which it proved susceptible.

Credit is next due to the men who, like James Thompson and William Dennis, developed new methods for cultivating the new breeds. As partners, these two—the one a bankrupt farmer turned potato buyer, and the other a wagoner—showed the way to the intensive cultivation practised to-day. Until their time potato-growing was a hit-or-miss business, and yields were almost uneconomically low. About 1880, Thompson and Dennis reasoned that the new Magnum Bonum ought to do well in their district of South Lincolnshire, but their first two efforts to grow it were failures. The third crop was a success, which they were able to consolidate when Up-to-date became available, and which showed that the essentials were good cultivation of the soil and heavy manuring. A refinement which later became standard practice was what is known as “chitting.” Before a potato is ready to plant, the “eyes”

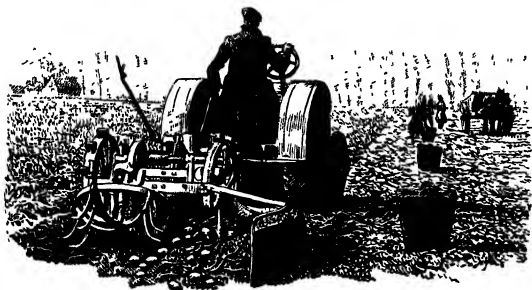
should have begun to show. One year a Lincolnshire gardener by accident left some potatoes in a basket. There they stayed during the winter and when he found them in the spring he saw they had put out sturdy sprouts, so that when sown they grew quicker and gave larger and better plants than usual. Now seed potatoes are "boxed" in large sheds known as chitting-houses, where they are allowed to shoot before planting, thereby hastening the harvest and increasing the yield.

Potato-growing in Lincolnshire, especially in what is known as the Holland Division of the county, because of its resemblance to the flat, dyke-and-windmill country across the North Sea, is to-day a highly expert type of farming. Its centre is the town of Holbeach, around which more than 30 per cent of the arable land is in potatoes. This is the chief potato-farming area of Britain. Others in England are the Isle of Ely, where there is the same type of Fenland soil as in the Holland district, Lancashire, particularly around Ormskirk, Cheshire, Bedford, Durham, Stafford and the West Riding of Yorkshire, and in Scotland, East Lothian, Midlothian and Ayrshire (particularly for early or "new" potatoes), Fife and Angus, and the northern counties of Aberdeen, Inverness and Gaithness for seed potatoes.

Potatoes are peculiar for two reasons. Firstly, they are extraordinarily susceptible to diseases, and, secondly, there is no practical value in their profuse foliage, which incidentally attracts most of the ills to which the plant is liable. The tubers themselves are, of course, rich prizes for the wire-worm, but almost all the other troubles of the potato-grower arrive by way of the leaves. The more serious of these—blight, wart-disease, and the notorious Colorado beetle—come out of America, as if Nature were determined to prevent the plant flourishing elsewhere. Blight can be treated by spraying the crop with Bordeaux mixture (which is copper sulphate mixed with lime-water and is so-called because it was first used by the wine-growers in the Bordeaux district), with Burgundy mixture (copper sulphate with washing soda and water), or with one of the newer chemical preparations, based on copper. Bordeaux spraying leaves the foliage with a bloom like that on a black grape so that it looks blue at a distance. For wart-disease no cure has yet been found, although certain breeds of potato—Majestic, Great Scot and Doon Star, for example—are apparently immune to it. The Colorado beetle, which wreaks havoc in other countries, has so far not yet succeeded in establishing a bridgehead in British fields, though determined insects, taking advantage of imported potatoes and air travel, make repeated attempts to break through the cordon sanitaire.

Even more serious are the virus diseases which have delightfully descriptive names such as leaf-roll, crinkle or mosaic. These are carried by aphids like the green fly, and in that fact lies the clue to Scotland's pre-eminence as the producer of seed potatoes. Not only are the Scots, both by tradition and efficiency, among the best potato farmers in the world, but it is one of the virtues of the climate in the north-eastern counties of Scotland that it is too severe for the unwelcome insects which cause or transmit disease. Seed potatoes from these districts are accordingly disease-free, and are eagerly sought after by growers in all parts of the British Isles and also in many countries overseas.

Those who have grown potatoes in their gardens know the work this entails, all the digging, ridging and hoeing, not to mention the back-aching job of dropping in the seed potatoes, and picking up the harvest. Potatoes are as expensive a crop in terms of labour as sugar-beet, if not more expensive; so it is not surprising that, like sugar-beet, they should have stimulated the inventiveness of the engineer into devising all sorts of contrivances to reduce the number of hand operations and consequently the number of men and women employed. Nowadays indeed, the whole business of cultivation, planting and harvesting is mechanised—with one exception. There are machines to plant the seed and to ridge up the rows so that the tubers will not show above ground (if they are exposed to the sun and light they acquire a tough, green skin which makes them uneatable), there are machines to hoe between the rows, and to spray the tops or haulms with sulphuric acid when the crop is ready for lifting. (This burns



POTATO SPINNER

off all the unprofitable foliage with the minimum of labour and without damage to the tubers. Weeds like charlock in wheat, you may remember, may be killed in similar fashion.) There are ingenious machines called "spinners" which plough up the potatoes, and spin them out of the earth. It is at this stage that mechanised ingenuity is halted, for it is still generally necessary for the farmer to engage a squad of temporary workers to help his regular farm staff pick the potatoes off the ground, and put them into baskets or bags. This is obviously both inconvenient and expensive—it is often as difficult to find suitable workers as it is costly to pay them—so it is an operation that calls imperatively for mechanisation. Already there are machines designed for the work, but unfortunately engineering genius has not yet succeeded in endowing robot fingers with the sensitiveness of those of flesh and blood directed by a human brain, with the result that they are unable with certainty to distinguish between

potatoes and stones, for example, or hard clods or anything else roughly of the same weight, shape and size. In parenthesis, you will probably remark the same sort of thing with many other crops, chiefly those of a market-garden character. Despite all the giant strides of science and technical ingenuity, harvesting, like singling, remains a task for the human hand. No machine has yet been designed, for example, to pick strawberries or apples or blackcurrants, or even carrots or brussels sprouts, or lavender or jasmine or peppermint, or any of the herbs which are the essentials of the scent and cosmetics trades as well as the accessories of good cooking. The price of many of these is determined almost entirely by the cost of the labour employed to harvest them. Lavender, for instance, most English of the garden herbs, is now grown little because, in spite of its quality, English lavender oil is far too expensive to compete with that distilled in countries where the cost of labour is far less than here.

It must be set down that there is a sad difference between the tonnage of potatoes per acre grown by the expert and the overall average for British agriculture. A good yield in ordinary land is of the order of 10 tons, though weights up to over 20 tons per acre have been shown to be possible in the best potato soils and with modern intensive methods. Against this the British average is no more than 7 tons per acre, an indication surely that our farms should, with care and attention, be able to produce far more of this essential foodstuff.

To revert, the potatoes, having been gathered off the ground, may be destined either for immediate use or for storage. If the former, they will be riddled for size, a process you are sure to see carried out on one side of your road or the other in autumn or early spring. The potatoes are poured on to an apparatus which, as a rough description, consists of two large sieves, one below the other, which shuttle back and forth. By this means the potatoes which are too small for normal use, and which are known as "chats," fall through the meshes, while the sizable or "ware" potatoes do not pass but roll down a board into sacks ready for transport off the farm. The "chats" either find their way to the factories to be processed into alcohol or remain on the farm as food for animals. Potatoes are not nearly so important for animal as for human food, and their principal use is for boiling to add to the rations of the pigs. If the potatoes are to be stored, they will be carted off and clamped until they are required, when the clamp will be opened and the potatoes riddled for market.

Most of the other arable crops are little more than farming extensions of the vegetable garden. That is, the sort of plants you will see growing on the farm-lands are the same as those you sow and tend in your own allotment or garden. They are, of course, cultivated by farm methods—being drilled and hoed by machine instead of by hand—and there is a difference of emphasis. The latter is illustrated by both peas and beans, which automatically invite consideration together as they are generally linked in the farmer's vocabulary. For some reason he will always speak of them in that order, but I shall take beans first. These are grown as food for horses and cattle. They are like the garden broad bean only smaller, but instead of being picked when young and tender, while the long pod is warm and furry to the touch and the beans lie like precious stones in their bed of silken down, the plants are usually allowed to dry into black and twisted



stalks on which the beans, dry, too, and hard as nuts, rattle in the now withered pods. This may happen by the middle of August, yet because the crop will not take harm by being left it may stand till well after the grain harvest and even into the New Year. I always see a presage of winter in these black skeletons which creak among the still-green weeds of early autumn as the breeze stirs them, like the corpses on the gibbet at Montfaucon, which François Villon describes in his grim epitaph. The drier the beans the better they will grind into flour. This contains a high percentage of protein and is thus a valuable ingredient of the production ration. In some northern districts the beans may be harvested while still green and succulent, and even made into silage. The trouble with beans, as any gardener will know, is that they are liable to attack by birds and black fly and virus diseases. Also, if planted to stand the winter, they may in a warm back-end come on too quickly and be struck down by the frost. Certainly, of late years beans seem to have become increasingly difficult to grow successfully, and are probably far less planted now than they were some years ago. Still, you should see them in most arable districts of Britain, particularly where the land is heavy. While they are in bloom, in May or June, they are a delight to the eye and the nose alike.

The flowers have white wings splotted with black, so that the field looks as if a host of cabbage butterflies had fluttered down and settled on the grey-green plants, but the probability is that, long before you come upon a field of beans in flower, your nose will have registered its presence. That is how it usually is with me. As I go along a country road my nostrils are suddenly assailed by a scent separate and distinct from all the other individual or blended snells of earth and flower and tree. It is a scent at once purer and yet more potent than the rest, and which seems to distil the very essence of the English summer. I know no other to compare with it, unless it be the breath of the lime-trees, but even this, delicious as it is, has not the perfection of the bean-flower perfume.

As a farm crop, peas are extending their acreage even faster than that of beans is diminishing. Peas surely require no description, save that field peas are not sticked but are dwarfs which riot over the field at a height of from a foot to eighteen inches. The flowers may be white or pinky, the latter having

pink wings and the centre, or keel, as it is called, magenta. A fairly safe guide is that if the peas are for animal food they will have coloured flowers, and white if for human food. You will find an excellent picture of the arable scene in general, with special reference to peas and beans, painted by the Dorsetshire poet, William Barnes:

*An' pease do grow in tangled beds,
An' beans be sweet to snuff, O,
The teaper woats do bend their heads,
The barley's beard is rough, O
The turnip green is fresh between
The corn in hull or hollow,
But I'd look down upon a groun'
O' wheat a-turnen yellow*

Time was when peas were grown almost wholly for stock, being allowed to ripen and then ground. They are fed to cattle or horses in a mixture with beans, or are gathered green and used as a sort of hay diet, usually with vetches. Nowadays the great developments of the canning industry and the advances that are being made in the preservation of vegetables and fruit by quick freezing have given a powerful stimulus to the growing of peas for direct human consumption. In the course of Nature this most delectable of vegetables enjoys all too short a season, a few weeks at most, no matter how expert the gardener and how skilfully he plants. Perhaps it is this transience which, joined with the delicacy and sweetness of its flavour, justifies the claim of the green pea to be the queen of vegetables. Certainly it loses much of its flavour when it is canned or frozen, but both methods do enable people to enjoy peas throughout the year, even though they may be tasteless by comparison with the fresh article, and frequently need to have the faded green of their complexion intensified by judicious colouring with a synthetic dye. So the farmer yearly grows more peas, which he knows will show him a handsome profit if he sells them well; while if, when they are ready for picking, the market is against him, he can still use them for stock food without losing money.



MAIZE FOR FODDER

Herein lies the fundamental difference between the farmer who grows a percentage of market-garden crops and the true market-gardener. The latter follows a mystery of his own, using large tonnages of organic manure to the acre and cultivating so intensively that he makes his land yield three or more crops a year. These are as heavy as they are frequent, and therefore very costly in men and muck and machinery. They are planted and harvested entirely for sale to the housewife or the hotel, though they will normally pass through the hands of wholesaler and retailer before reaching them. The market-gardener is thus always at the mercy of the market. He may, for example, have a fine crop of early lettuces, or little white turnips or very late peas, and writes or telephones a wholesaler at London's Covent Garden market. He is liable to be told either to send up all he can transport, which means that the market wants the supplies in question, which will therefore make a good price; or that there is a glut and no more supplies are wanted or can be handled. Probably the grower will then urgently telephone the market of another of the great cities, Birmingham or Manchester or Glasgow. One of these may be willing to take his crop, but the distance is longer, and transportation slower, so that the vegetables will not arrive as fresh as they might. Also, prices may be lower than in London. Still, if he gets an offer he will normally choose to despatch the crop on which he has spent a large amount of thought, energy and expense. His alternative is to clear it off—involving labour, and therefore more expense—and heap it for compost; in other words, his money has been lost.

The farmer is in far happier case because he will grow no more than a few fields of market-garden crops, and can always use these to supplement his stock rations if he cannot market them at a price which shows him a profit. So a high percentage of farmers to-day grow peas, cabbages and cauliflowers, brussels sprouts, carrots and beetroot; crops which you will see particularly in the southern and eastern half of England.

In the same districts you will also see some fields of maize or Indian corn, identifiable at once as a dark-green plant, with glossy leaves, standing from three to five feet in height. Maize may be grown either as a forage crop for stock or to yield the luscious cobs popularly known as sweet corn. For animal feed the seeds are drilled close together, so that the crop looks like a tightly-packed stand of lances with green pennons, and is cut in swathes like kale before it has a chance to ripen into flower. If it is intended for human food a much larger gap is left between the seeds, and the plants are later thinned to about two feet or more apart. In due course the tip of each plant will be decorated by a ragged, inconspicuous flower, but the cobs will form on the lower half of the stalk. At first, their green sheathes will hang out a reddish or greenish-white tassel; and when this dries off the fruit inside should be a pale golden yellow and ready for eating,



A HEAD OF MAIZE



by which time the parent plant will have started to wither and become tough and fibrous and therefore have passed its stage of value for animal food.

It is an exotic crop, whose home is in more torrid climes, and, although varieties have been developed which are hardy enough to mature in an English summer, they are sensitive to chills. The slightest night frost will strike down the tender young plants, so that maize is usually sown in May when the danger of frost is past. Fortunately it grows very rapidly and in a hot season and on the right land (it needs moisture) it will ripen by early September. In climates hotter than ours, of course, the ears are allowed to mature, and are then dried to become the Indian corn we give to poultry, as well as ground as an important ingredient of many cattle and pig foods, either meal or flakes, not unlike a coarse sort of breakfast cereal.

Another constituent of these cattle foods is linseed, and linseed—whether as a sticky poultice for aching chests or as the oil which is still of the first importance in the manufacture of paints and varnishes—should need no introduction to the most inveterate townsman. It is the seed of the flax, which, though not a familiar crop on British farms, may be seen growing in most districts where the soil is not too light and dry. Flax is a graceful plant about two to three feet in height, with a delicate tracery of foliage suffused at blossom time with a mist of pale blue or white flowers, which is unmistakable. It is still easily recognisable, even when the crop has ripened, when the slender leaves have fallen and the flowers have given place to small, round, brown seed-pods or bolls. This will be from late August to early October, according to the district. For so small a plant its value is unique. The seeds are crushed to extract the oil which must be boiled for industrial use. The residues form a rich food for stock, too rich indeed to be used as a staple ration, and are either mixed with other substances to make concentrated cattle cakes, or are fed as a special diet to improve the condition of horses, cows and calves. Meanwhile, the stalks yield the fibre which is the raw material of linen. In some districts the crop is indeed cultivated wholly for its fibre, particularly in Northern Ireland, whose reputation for fine linen is world-famous. For this purpose the stalks must be “retted”; that is, rotted down in water before being dried and the valuable fibres separated from the tow.

Different types of flax have been developed to yield linseed and linen; the yield of oil will depend upon the number of seed-bolls for milling, the quality as well as the quantity of the eventual textile will depend on the length of the fibre. Accordingly, flax grown for linseed is short and shrubby, with many branches to bear the greatest possible number of bolls; for linen it is tall-stalked and slender, with fewer branches. The distinction between the types—of which there are several varieties of both—is probably too nice for any but an expert eye to register, but the method of harvesting will tell you precisely the purpose for which the crop is intended. If for crushing it will be cut like grain with a reaper and binder; if for retting it will be pulled up by hand or a specially-designed machine. Like sugar-beet, flax is usually grown by the farmer under contract to a factory which makes all the arrangements for

buying and processing his crop and supplies him with the right quality seed for use for next season's sowing

Flax takes us a stage away from the crops essential to the economy of the farm, and affords a timely reminder that despite the march of science and the development of man-made fibres such as rayon and nylon and the rest that will surely emerge from the laboratory, our soil still provides our factories with raw materials as it does our bodies with their daily sustenance

So as you go your ways up and down this pleasant and variable land, where the changes of scene are as swift and unpredictable as the climate, you will notice many arable crops which are strangers to you, which are grown in certain districts for special purposes and which I have no space even to enumerate You will certainly see acres and acres of violet lucerne and vetches, crimson clover and pink sainfoin which we have already noted among the grasses, and these you should recognise without difficulty The joy should be when you come upon something quite out of the ordinary which arrests your attention and stimulates you to identify it by a book of reference It will surely happen For example, one summer morning when I was travelling from Norwich to London by rail my train stopped outside the lonely station at Lakenheath, on the edge of the Cambridgeshire Fens Beside the line was a field in which flowers of a pale heavenly blue swayed on the tops of tall stems I looked again and saw that it was a crop of chicory or, to give it its more lovely English name, succoury. Succoury I knew as a wild flower of the hedge bottom, but here it was being cropped either as a vegetable or possibly for its roots to be roasted and ground for blending with coffee You may easily see succoury, for it is grown in many parts of Britain with grasses and clover as pasture for folded sheep



FLAX PULLING



CHAPTER ELEVEN

THE WORLD'S STUD FARM

HAVING now, I hope, left you with some general idea of the pattern of British crop farming, we can consider the stock kept on our farms, the animals you see grazing on both sides of your road, on well-groomed meadow or rocky hillside. You are likely to meet a representative selection of horses, cattle and sheep, but pigs will be less in evidence, because the pig is still considered rather as a person to be confined in a sty than allowed to range freely as he does in a state of Nature. If you are determined to gain accurate knowledge of the different breeds, not only of pigs but of all animals, you will need to leave highway and by-way and seek them out in the warmth and security of their stalls and yards and pens among the farm buildings, or, better still, at one of our great agricultural shows.

In the breeding and rearing of stock Britain is so far and away in the lead that no other nation can offer a challenge to her. Since the era of modern farming began, Britain has been the world's stud farm. Not only have almost all the breeds kept by farmers throughout the civilised world been developed by British pioneers, but their quality must be maintained by regular infusions of fresh blood from the British Isles. In most of the great farming or stock-raising countries it is advisable, and in many cases essential, for fresh stallions, rams, bulls and boars to be imported regularly from Britain: otherwise the quality of the stock will speedily begin to deteriorate. There are exceptions to this rule. New Zealand is apparently so much like the Mother Country that British breeds of sheep do as well there as at home, so that New Zealand actually shares with Britain the world pedigree trade in Romney Marsh sheep. For this abiding

III

excellence of British farm stock, credit must go to the mellowness of our much-abused climate, which enables us to grow such excellent grass, as well as to the imagination, care and thoroughness, first, of practical breeders and later of scientists. For example, of the many types of cattle kept for milk and meat, all but two—the Brown Swiss and the Friesian—are of British origin, of all the breeds of sheep for wool or mutton, only one—the Spanish Merino—cannot claim a British ancestry. With horses the supremacy is less overwhelming, and the English Shire and the Scottish Clydesdale have won for themselves possibly little more popularity overseas than the French Percheron or the Belgian horse, but, to tip the scales again heavily in our favour, one need only add the thoroughbred horse, or racehorse, not, it is true, a farm animal, but the universally recognised aristocrat of horses and as essentially British as its name proclaims.

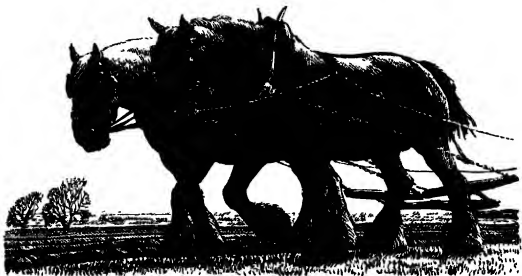
To digress for a moment, the thoroughbred is the outcome of probably a century and a half of selective breeding of native British horses with the smaller and more delicately-built breeds commonly referred to as Arabs. The historic fact is that every modern racehorse, no matter in what country it is found, ultimately traces its descent back to three of these so-called Arab or Eastern horses—the Byerly Turk, the Darley Arabian and the Godolphin Barb, imported into England respectively about 1689, 1706 and 1724. The first was the charger of a Captain Byerly, the second was brought in by a Mr Darley who lived in the Malton district of Yorkshire—still a famous horse-breeding centre—and though the third perpetuates the name of the Earl of Godolphin, the credit for importing it is another distinction for the great Coke of Holkham.

The early steps towards the evolution of the thoroughbred almost certainly began much earlier than 1689, and it is surely noteworthy that this most characteristically English achievement must be closely associated with Kings straight out of Scotland. James I may be said to have laid the first foundations of Newmarket's prosperity, and his son, the ill-fated Charles I., did much to encourage racing and to improve the breed of horses, but important development began with the importation, in the reign of Charles II., of about forty Arab mares which were kept as a Royal stud. It is peculiarly fitting that this step was made by a sovereign who, in spite of his mixed Scottish-French ancestry, was a great Englishman and one to whom the sciences in Britain—of agriculture as much as the others—owe so much by his patronage of the Royal Society of England. Incidentally, Charles also found time to ride his own horses to win races at Newmarket Heath on more than one occasion. This digression is by way of tribute where tribute should be paid. The certainty is that it was not until the second half of the eighteenth century that the racehorse, as recognised throughout the world to-day, approached a standardised type.

To revert, the record of British stock is much the same with pigs. Most of those kept for pork or bacon in any country are either British breeds or else breeds in which there is a preponderance of British blood, though great popularity is enjoyed in North America and elsewhere by pigs of foreign or mixed origin developed into standardised breeds in the U.S.A.

For the uses of agriculture, as noticeably as for those of industry or war, the horse is steadily but inevitably losing ground to the machine. Already it is a





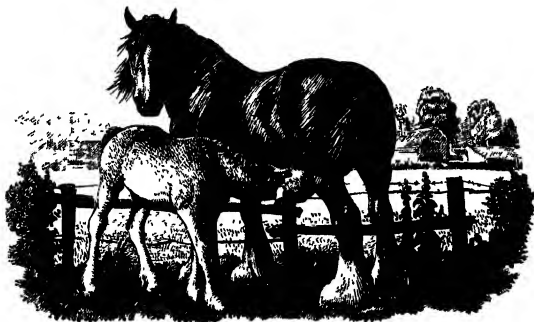
A PLOUGHING TEAM OF SHIRES

reasonably accurate generalisation that it has been ousted by the tractor, but though its usefulness has been so circumscribed, it is certain that it will never be eliminated. There are likely, as I have indicated already, always to be purposes or circumstances for which the beast will be preferable. It is, alas, true that the horse is no longer as important a farm animal as are cattle, sheep or pigs, but those who feel deeply the horse's fall from its once high estate may suck some consolation from the knowledge that it was only comparatively recently that it superseded the ox, which, up to the beginning of the eighteenth century, did practically all the heavy work on our farms. Oxen, indeed, continued to be used almost into the present century, and a few ox-teams remained as show-pieces up to no more than a few years ago. I remember as a boy myself seeing two red Sussex oxen lunging rhythmically into the yoke as they pulled a plough over the high Downs above Lewes.

Although there are hilly and mountainous districts where farmers and shepherds ride ponies or cobs in the course of their daily work, the only class of horse really necessary to modern farming is the heavy draught animal, of which there are five varieties, three British and two alien. The most popular and widely distributed of our native horses is the Shire, a name which seems misleadingly to indicate that the breed was originally developed in the "Shires," which to-day are associated rather with the lighter classes of riding horse, known loosely as hunters. Whatever district of England was the cradle in which it was nursed, the Shire is almost certainly the descendant of the Great Horse or War Horse, on to whose wide back the iron-clad knight of the Middle Ages was pushed or hoisted. The Shire is the heavyweight of all horses, fully-grown stallions turning the scales at anything up to a ton. It is easy to recognise, not only on account of its size but by its thick neck and heavy head, its short back and particularly by the long "feather" on its feet. Handsome though this feather

looks when well-washed and groomed (as you will probably see it on dray horses in the streets of towns and cities), it is a handicap on wet and heavy land. If it is not kept clean there is a danger of the horse's feet and legs becoming diseased. Yet it is there for a purpose, as farmers find when they think to improve matters by cutting it, which exposes the leg to a foul-smelling and serious affliction known as "grease." Except for this defect, the Shire has all the qualities required of a heavy draught animal. It is immensely strong, it is a "good doer"—which is to say it makes the maximum bone, muscle and energy from the food it is given—and, so long as speed or sudden haste is not demanded of it, has great powers of endurance. Most important, it has an equable temperament, always docile and often phlegmatic. This is essential, for in the course of its daily duties it will constantly be required to stand still for long spells—while the cart or tumbrel it is drawing is being loaded or off-loaded, say, or while adjustments are being made to plough or harrow—without becoming restive or impatient, no matter that it may be pestered by the attentions of flies and mosquitoes or have its nerves jarred by the sudden, machine-gun rattle of the rival tractor. It would be hopeless to employ on farm work a horse with the nervous, highly-strung temperament of the thoroughbred. Equability of temperament is another characteristic of British farm animals, few of which have to be classed as of uncertain or unreliable temper.

The English Shire is, in short, the embodiment of "slow but sure," but it is not at first sight very different from its Scottish cousin, the Clydesdale, and indeed you may well be forgiven if for a start you confuse the one with the other. The Clydesdale has much the same build and is used for much the same purposes. It is big, it is heavy, it has feathered legs and it is of the same bay colour. Here



SHIRE MARE AND FOAL

it should be explained that bay describes a brown horse with black mane and tail. Shires and Clydesdales are both normally bay, though any colour is permissible from grey, through middle and dark brown, to almost black. The horse may have white socks and possibly a white blaze on its forehead. Many Clydesdales have a white mark on their bellies. This is an example of the persistence with which a particular strain reproduces its characteristics. Years ago there was a famous Scottish sire called Footprint because he had a mark like a white footprint on his stomach, and to-day every Clydesdale bearing this mark may be recognised as his descendant. In parenthesis, a brown horse with brown or sandy tail or mane is known as a chestnut.

To return, the Clydesdales' legs are both longer and thinner and their bones are not so sturdy as the Shires', and not only is the feather less but it grows only on the backs of their legs. Other differences which will be less obvious to you at first sight are that it has a longer body and a longer and more curved neck and walks faster. The increased fineness of its build goes with a decrease in temperamental stability. As a generalisation, the Clydesdale can do almost all the work of the Shire, but is more highly-strung and therefore needs more care in breaking in and handling for farm work.

As a generalisation again, you may see both Shires and Clydesdales in fields and farmsteads almost anywhere in the British Isles though the Shire is the more widely distributed, and the Clydesdale more likely to be met with in the North and particularly in its native Scotland. Both are popular overseas in the United States, Canada, New Zealand, Australia and elsewhere.

The same cannot be said of the Suffolk Punch, which we noted in our journey across England as one of the products of East Anglia, and which is still not common in Britain outside East Anglia, though it has crossed the Atlantic and is popular in Canada and U.S.A. In colour it is usually a light chestnut, with fawn or brown mane and tail, an arched or crested neck such as one associates with the horses of Greek bas-reliefs, and clean, featherless legs. Without the massiveness of the Shire, it is almost as heavy as the Clydesdale, though you would never think so at first sight. It is far more compact, a chubby, rounded animal, indeed "punch" is an old word signifying something "short, thick, squat, fat and strong." Samuel Pepys notes in his diary "hearing some people call their fat child 'Punch,' which pleased me mightily, that word having become a word of common use for all that is thick and short."

If the Suffolk is thick and short, it is also strong, and, if well fed, easily becomes fat. Its reputation for being a "good doer" as well as a good worker is responsible for its present popularity. By comparison with the Shire and Clydesdale, it is a good trotter and has been found useful for light van work in our great cities.

The Percheron is decidedly a foreigner. The breed was originally developed in the district of La Perche, south of Paris, and shows a strong admixture of Arab blood. On this account it is the smallest of the heavy draught horses and also the fastest mover. Indeed, its original function was to haul the heavy coaches over the pavé roads of France before the coming of the railway, and only since the age of steam has it taken its present place among the draft animals

of the farm In Great Britain the Percheron was practically unknown until the war of 1914-18 brought numbers of British transport officers and horse experts to a recognition of its merits The British Percheron Society was formed in 1918 and there began such a steady importation of horses into Britain that it was not long before they were to be seen all over the country. Since the commonest colours are grey, dapple-grey or black, the Percheron is easily picked out from other breeds even by those who do not register other points of difference I personally often find it difficult to believe either that it is smaller than other breeds or that it can move faster Yet these are facts, and the second is one reason for the supremacy of the Percheron over British breeds in the



PERCHERONS

favour of the U.S.A Other points are its equable temperament, and hardy constitution.

The only other draught horse is the Belgian or Flemish horse, a heavy animal, though not quite equalling the Shire, and most difficult for the inexperienced to identify because it has so few distinctive points or markings. For instance, though usually black, a Belgian horse may be chestnut, bay, brown or roan, and so can be mistaken for almost any of the other breeds.

These, with the exception of the ponies and hacks used in certain districts by shepherds, drovers and others, are the five breeds which to-day represent the horse on British farms, and any horse you may see will be recognisable as belonging to one or other of them. Of course by no means all horses are pure bred. A great many farmers are content to keep animals whose ancestry is so mixed that they can only be called horses—of no recognised breeding. This is short-

sighted policy and false economy, but it applies to cattle, sheep and poultry as well as horses. A high percentage of the cows and bullocks you come across can be designated only as scrub cattle, just as most of the hens that scratch around the farmstead can be described as "barn-door fowls"—the result of indiscriminate cross-breeding. The first-class farmer will seldom be guilty of this, and you can reasonably assume that the presence of scrub animals on a farm denotes a poor or careless farmer. The pure-bred animal has two advantages over the cross-bred; it is, as it were, a guaranteed article, the character and performance of which can be predicted and relied upon—the farmer knows how it will react to different treatment, different foods and conditions of work. Secondly, because it is a guaranteed article, its progeny will almost always command a sale and at higher prices than could ever be obtained for a mongrel. I repeat, the best advertisement for British agriculture is the world demand for British pedigree stock.

To come back to horses, though many you see will not be pure-bred, each is likely to favour the breed which predominates in its ancestry. They will be Shire-type, Suffolk-type or Percheron-type horses.

Mares are usually mated when they are between two to three years old, and so that the foal shall be born between April and June when work on the farm is likely to be slack, the season when crops are growing and there is little carting or hauling to be done. The period of gestation is eleven months, and on the ordinary farm where horses must earn their keep, the in-foal mare is allowed to work up to seven to eight months and is sometimes kept on light work almost up to foaling-time. After the foal is born the mother is rested for a month and then put to light work, according to the needs of the farm. The foal trots by her side for the first few months of its life, but is weaned at four months. Thereafter it is allowed to live a life of glorious idleness until it has passed its second year, when it is broken in to bit and harness and finally becomes a useful member of the farm staff at about three years old.

This all sounds simple when set down as a time-table, but it is very far from it. Horse-breeding and rearing is a risky, difficult and complicated business. To begin with, the horse is the most difficult of the farm animals to breed, the fecundity of the mare being well below that of all other domesticated animals and a high percentage being permanently barren. Next, both mother and foal require more expert human attention during foaling and afterwards than other farm mothers and children, and, lastly, the task of breaking and disciplining the young horse calls for patience, sympathy and firmness. When a mare is getting near her time the farm shows signs of agitation. There are telephone calls for the vet; the farmer and his horseman sit up into the small hours and lanterns are seen moving about the farm buildings in the darkness. The curious thing is that no matter with what anxiety and care the expectant mother is watched, she nearly always produces her offspring in a twinkling when there is no human eye upon her. Her ability to hold back her foal and then to expel it on the instant is remarkable.

The ordinary farmer leaves breeding, or certainly breeding for profit, to the expert. If he breeds from one of his mares it is more likely because he wants

an addition to his draught horses than to make money. Few ordinary farmers can afford to keep first-class pedigree horses for the purpose of breeding. It means diverting too much attention, time and money from the prime job of farming the land. Horses also need careful feeding. They can subsist on a diet of grass, but it is not enough for them to work on. When working they must be given oats, and sometimes linseed mash.



CHAPTER TWELVE

CATTLE · BREEDS AND PURPOSES

IF the horse is agriculturally already something of a survival, cattle are the axis on which the whole wheel of farming turns, the producers of milk and meat and the dung that is indispensable to fertility. To the uninitiated townsman, one cow, one heifer, one bullock may look very like another. Even when the scales have fallen from his eyes and he has begun to take note of what he sees on both sides of his road, he may still claim, with justification, that there is a sameness about most of the beasts he passes. Most of them are reds, red-roses, black and blue roses, though there are obvious exceptions, such as the clown-faced Herefords, the black and white Friesians and the gentle fawn and tawny Channel Island breeds.

Still, I fancy that not until you make a serious tour of the cattle exhibits at one of our great agricultural shows—preferably the “Royal,” the annual exhibition of the Royal Agricultural Society of England and the premier event of the British agricultural year—will you get any clear idea of the number and variety of distinct breeds of cattle, each with its own herd society and pedigree book. That is how it was with me. Although country born and bred, and used from my childhood days to run about on farms, it was not until I became a serious visitor to the “Royal” that I realised that, in addition to all the usual breeds of cattle with which I was more or less acquainted, there were such specialties as Belted Galloways, Blue Albions and diminutive Dexters. What a ring there is about the names even, and what visions they conjure up! Albion, for example, not only perfidious but blue, blue as our best native cheeses, Stilton or Dorset Blue Vinney, now, alas, so difficult to find.

In point of fact, the Royal Agricultural Society of England to-day recognises

no fewer than twenty-two distinct breeds of cattle, each with its own pedigree and herd society. These can be classified under three headings; those designed for one or other of the specialised functions of making beef or milk, and thirdly, the all-rounders or dual-purpose animals, bred to make good beef and also to yield efficient quantities of milk.

<i>Beef</i>	<i>Dual-Purpose</i>	<i>Dairy</i>
Shorthorn*	Shorthorn*	Shorthorn*
Lincoln Red*	Red Poll*	B Friesian*
Aberdeen Angus*	South Devon*	Ayrshire*
Hereford*	Welsh Black*	Jersey*
Devon*	Longhorn	Guernsey*
Galloway*	Blue Albion	Kerry
Sussex	Park Cattle	Old Gloucestershire
Belted Galloway	Dexter	
West Highland		

These divisions must not be taken strictly as water-tight, as there have, for instance, been dairy herds of Herefords and Friesians which were bred for beef.

In the beginning, so it is believed, the cattle indigenous to Britain were small, short-horned beasts, either brown or black in colour. As the Roman occupation spread over the country, the native British tribes were driven back into the remote corners and hilly parts of the Island, taking their herds with them, and the blood of these ancient Celtic beasts still flows in the veins of some of the smaller breeds to be seen on our farms to-day, particularly the Welsh Black and the hardy and capricious Kerry from Ireland. Another breed which shows traces of Celtic blood is the Jersey, which has for centuries not only been isolated in its native island, but certainly for the last 200 years kept free from any admixture of foreign blood.

The Roman occupation of Britain, which lasted for no fewer than 400 years, built a bridge with the Continent of Europe over which many cattle were introduced. These were white animals with long horns and black muzzles and are probably the ancestors of the white Park cattle, which, as we noted on our journey north, survive in small herds on private estates like Chillingham, Chartley and elsewhere; though there is another theory that these Park cattle are the descendants of the Urus or wild white ox, which in Roman times roamed the forests of Europe.

When the Roman legions were recalled, they not unnaturally left behind them a civilisation which included a well-ordered system of agriculture. This, unfortunately, was destined to be shattered by the invasions of people from Northern Europe, the Anglo-Saxons and the Danes, both of whom, however, brought in fresh types of cattle, the former animals of a red colour, and the latter probably the first hornless or polled cattle. Thereafter a gap of several hundred years ensued before the next big influx, which took place in the seventeenth century, the animals coming from the Low Countries and being of a broken

* See page 130



GALLOWAY AND BELTED GALLOWAY

colour Shortly afterwards, the first steps began to be taken in the selective breeding which was to place Britain in the pre-eminent position which she has occupied for the past 200 years It is a reasonably accurate generalisation that the breeds which were pushed into the far corners of the country at the time of the Roman Conquest survive to-day in the individualistic breeds still associated with particular localities, like the ginger South Devons, the Red Sussex, the tawny Channel Islanders and others, while from the mixed breeds which formed the floating population of North-eastern and Midland England was slowly evolved the most universally distributed and popular of all British breeds—the Shorthorn

The Shorthorn is the great cosmopolitan Wherever in the world there is a stock-raising or dairying district, there Shorthorns will be found You will see them throughout the length and breadth of the British Isles, though you may not immediately identify them, because of their lack of individual characteristics They represent a fusion of the indigenous British strain with the various types that have been brought in at different times from Europe As we noted in our first chapter, the foundations of the modern breed were laid in the second half of the eighteenth century by the two brothers, Charles and Robert Colling, who lived in Teesdale, near what is to-day the smoky railway town of Darlington. They were not, however, the first of the great pioneer breeders That honour must go to Robert Bakewell, a Leicestershire farmer, who began operations about 1760 Although Bakewell showed how a standard type might be built up by careful inbreeding between beasts picked for their individual excellence, he selected for his experiments the cattle prevailing in the West Midlands, where he lived. These were old-fashioned Longhorns, but no one followed exactly in his footsteps and at his death the Longhorns were neglected, until to-day it is numerically a small breed confined to certain parts of Warwickshire and the West Midlands and one you are not likely to come across except at one of the bigger agricultural shows There is no mistaking it. Its horns are roughly the same length as those of the Highland cattle, and its colour is quite distinctive,

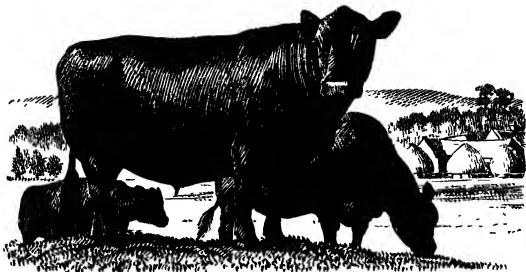
being a brown brindled, or perhaps more accurately, marbled with darker brown and black, with a white line running along its spine like the Hereford.

Although following Bakewell's methods, the Colling brothers chose the cattle at their farmhouse door, the cattle kept by farmers in the fertile valley of the Tees and on the broad acres of the flat Holderness district of Yorkshire. These "Teeswaters" were beasts with short horns, large bodies and of a colour in which red and white predominated. This almost describes the Shorthorn of to-day, and the breeders' achievement has been to raise the quality of all animals to a uniform excellence and to fix this as the type which can be bred to with reasonable certainty. The story is that the Collings began in 1780 by buying a bull from a neighbour for the modest sum of eight pounds. For this animal, which they called Hubback, they chose four of the finest quality heifers they could find and began a course of careful inbreeding, mating like with like. No less an authority than Sir John Russell has said that from this herd of five hand-picked individuals stem all the mighty armies of Shorthorns kept on the world's farms to-day.

The Collings did not aim at over-specialisation. Their type was meant for both beef and milk and, generally speaking, the Shorthorn has remained a general-purpose animal until modern times, though both a purely dairy and purely beef type of the breed have gradually come into being. The former owes its origin principally to Thomas Bates of Kirk Levington in Yorkshire, whose object was to improve the milk-producing capacity of the breed, and the latter to a Scotsman, Amos Cruickshank of Aberdeen, who, in 1858, bought an English Shorthorn bull named Lancashire Comet. This bull was the foundation of what was soon to become the famous Scottish breed of purely beef Shorthorns which to-day are prized the world over. In 1858 Lancashire Comet cost Cruickshank no more than thirty guineas, in 1946 the Scottish Shorthorn champion bull, Pittoddrie Upright, was bought by a buyer from the USA for the sum of 14,500 guineas. This works out at nearly £1 per oz of weight.

It is not easy to give any one reason for the world-wide popularity of the Shorthorn, though an important one is that because of the many strains, British and Continental, which it embodies, it is peculiarly adaptable to all sorts of different conditions. No matter where it goes it thrives, whether as a giver of beef or milk. No other breed has quite this adaptability.

Incidentally, there is a close connection between the soil and climate of a particular district and the type of beast which develops and thrives there. A notable example of this is to be seen at the moment. The peculiar conditions prevailing in the south-west corner of Scotland resulted in the evolution of the Ayrshire, that brown and white dairy breed which I mentioned in my first chapter. The Ayrshire, as a breed, dates back to about 1790, but how it developed is not known. Some twenty years ago farmers in England looked with favour on these fine-limbed, small-footed beasts and began bringing them down to replace the heavier Shorthorn on English farms. Points in their favour were that they were hardy, good doers and much lighter on the hoof, so that they made less of a mud-pudding of meadows and farm approaches in wet weather. Owing apparently to the milder English climate and the richer pastures, the English Ayrshire has already begun to show an appreciable increase in size and



ABERDEEN ANGUS BULLOCKS

weight and is indeed losing some of the very points which were first responsible for its popularity

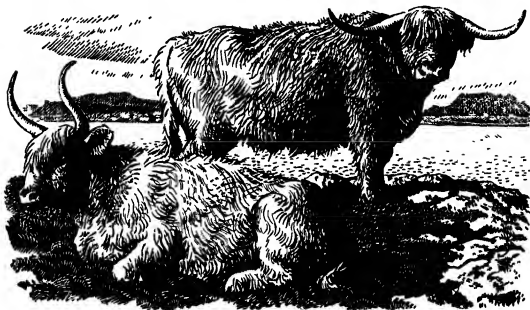
To revert, the Shorthorn type of cattle is the commonest on English farms, though by no means all you will see are pure-bred, or anything like it. The pure, pedigree animals are the aristocrats of the farm as of the show-ring. The ordinary rank and file are usually of mixed ancestry, especially the cows or bullocks kept by the small men who constitute the bulk of British farmers. No fewer than four out of ten farmers farm holdings of fifty acres or less. A good many of the animals you see in the fields will be mongrels, or what are known as "scrub" cattle—the result of indiscriminate crossing—whose yield of milk or growth of flesh show the farmer but a poor return for the food he gives them. It is no coincidence that the commonest scrub cattle will be of the Shorthorn type, that is a heavy beast, with short horns, and of a red, red and white or red-roan colour. This may be due to one of two things. It may mean that the common stock from which the Shorthorn was evolved is still the most widely distributed throughout Britain; or it may be a testimony to the recognised prepotence of the Shorthorn strain which has the power of stamping its characteristics on the progeny of second-rate breeds with which it is mated.

Alongside these red and white Shorthorn types in the meadows and stockyards you will see almost as many black or blue roan. These are the beef animals, bullocks kept for manure and to fatten for beef. Already I have explained that if pure-bred they are likely to belong to one or other of the two famous Scottish beef breeds, the Aberdeen Angus or the Galloway. If they are blue roan or blue grey they are likely to be the progeny of an Angus or Galloway crossed with a white Shorthorn. In contrast with the Shorthorn, the Aberdeen Angus is one of the local breeds descended from the ancient cattle of the counties of Angus and Aberdeen in North-East Scotland. Records of the breed indeed go back as far as the middle of the sixteenth century, since which time all Angus cattle

have been hornless To-day the chief reservoir for these black-poll'd beef cattle which are seen not only all over the British Isles but in most farming countries of the world, is the district between Inverness and Perth

To say that the Aberdeen is black is to do it less than justice In late summer (when the bullocks are fat enough to start on their last sad journey to the butcher) they are a picture of ebony health Their short, glossy coat is stretched tight over the plump body like black velvet On the neck, where the skin is looser and soft as doeskin, the light catches the ripple of the powerful muscles. A few months later all this summer polish will have gone and the coat have grown longer winter hairs which show rusty red as they are caught by the feeble rays of the wan autumn sun

As might be expected from its strictly local origin, the Angus, though



HIGHLAND CATTLE

universally popular, has proved itself less adaptable than the Shorthorn. One region where it has registered its greatest overseas success is the cornbelt of the U S A , in America's arable Middle West

The Galloway, which is also black and hornless, may, as we have already noted, be easily distinguished from the Angus, if only by its rougher, curlier coat and forehead. It is another local breed of great antiquity, hailing originally from the south-west corner of Scotland, whence it has spread into England and been exported in large numbers to Canada and the U S A . Although it was developed in what should be the more temperate side of Scotland, the Galloway is far hardier than the Angus, and looks it, with its rough coat and square head. It can safely be allowed to remain out on the hills through all the wet Lowland winter of snow and rain. The Angus, by contrast, is a beast of the sheltered valleys and seldom pastures on the mountain slopes. The Galloway, however,

is the slower to fatten and though when crossed with a white Shorthorn it gives the same blue-grey cross, thus also makes growth more slowly. It is meet here to mention its noble cousin, the Belted Galloway, a most distinctively marked animal with its own jealously guarded pedigree and register. Compared with the other types we have mentioned, it is of little agricultural importance and is more likely to be seen at shows than in the fields, but it is certainly in appearance one of our most outstanding breeds, as the picture will show. It is something to note down when seen.

From these Scottish beef cattle it is an obvious step to the West Highland or Highland breed. These small, shaggy but handsome animals have become almost as much one of the emblems of Scotland as the thistle. Of all our native cattle they are surely the most painted and the most libelled, encountered in the innumerable Highland scenes which are to be found in every picture-dealer's shop and in so many "best parlours"—water-colours of blue mountains, very purple heather, pale mists and a group of Highland cattle with their feet in some mountain tarn, the whole in gold frame and mount, price 30s or best offer!

Highland cattle are natives of the Scottish Highlands and of the Western Isles. It is obvious from their shaggy coats that they are adequately clad by Nature to endure the rigours of winter on the mountains of the mainland or the storm-buffed pastures of these islands which seem insecurely anchored in the trough of the seas. Commercially they are far from ideal because they make beef very slowly, though the beef, when ready, is of excellent quality, which explains why such keen gastronomes as Yorkshiremen set such store on it. It was the custom until recently in the Yorkshire Dales always to have Highland cattle ready for the joint on Feast-tide Sunday.

Highland cattle show a wide range of colours, red, yellow, dun, cream, black and brindled. They are unusually poor milkers and the cows give little more milk than is necessary for their own calves. That, of course, is natural, but is a very poor performance compared with the modern dairy queens who continue to give about five gallons of good-quality milk a day for three to four months after the calf has been weaned, and are only dry for about six weeks in the year.

Of our other beef breeds, all of which are English and many of which we have met already, the Hereford claims premier place, being recognised as a guarantee of good beef all the world over. Its appearance, no doubt, is a great help. There should be no mistaking that sturdy build, the white face and the horizontal horns whose slightly turned-down tips give an air of surliness. As early as the year 1600 they were already held in high esteem in their native district on the marches of Wales, and steps to improve the type were taken in 1745, even before Bakewell began his historic experiments with Longhorns. In Britain the Hereford is still distinctly a localised breed, and though you may meet Herefords or half-bred Herefords anywhere in Britain, and on the cattle ranches of the Argentine and the U.S.A., the principal pedigree herds are still scattered along the Welsh border from Cheshire and Shropshire in the north to Hereford, Monmouth and Gloucester farther south. It is not that the Hereford makes superlative beef, but rather that it gives a high yield on indifferent pasturage and is highly



RED DEVON BULLOCKS

adaptable to different climatic conditions. It is strong and a good doer and seems to be able to flourish as well on the arid ranges of South America or Texas as on the rich grass pastures of our Western counties

The other beef breeds, though interesting in themselves, are of relatively minor importance, being far less widely distributed at home and only exported in comparatively small numbers. The Lincoln Red is really no more than a localised variety of the Shorthorn, though in colour it is whole red of a peculiarly rich, deep shade. Like the Shorthorn, it is a dual-purpose as well as a beef type. Both the Sussex and the Devon are also of a whole red colour, though of quite different shades, the Sussex being of a hue still darker than the Lincoln, and the Devon, you will remember, a lighter and almost ruby-red, as if Nature intended it to blend with the warm red soil of its county of origin. Both have shortish horns. The Sussex was developed mainly for draught use in the days when the ox and not the horse did all the heavy work on the farm, and was certainly thus employed in Kent and Sussex long after the horse had come into its own elsewhere. It is a very strong and hardy animal and has in recent years established itself in the Union of South Africa.

The Devon might for greater accuracy, and to distinguish it from the South Devon, be known as the North Devon. Its home is in the hills of the North Devon and Somerset borders. It again is an old-established breed which had won a reputation for itself as far back as 1700. In its native country it is one of the smaller breeds, but where it is kept on lower-lying farms in England it tends, like the Ayrshires, to become larger and heavier. It is a hardy breed and may even be regarded as a dual-purpose.

Concerning the dual-purpose breeds there are two schools of thought, one claiming that they are economical in that they fulfil either or both purposes, the other representing that dual-purpose is no more than a compromise which must mean less than efficiency in the production of either beef or milk. Though popular in Great Britain, they do not seem to have won the same outstanding popularity for themselves overseas as the more specialised breeds have done. The

Red Poll is widely kept and popular, particularly in Norfolk and Suffolk, and recently has become distributed over a large part of England. A few are even to be seen in Scotland. You can easily recognise them wherever you meet them because they are the only wholly red beasts without horns. As a cow for the small mixed farmer who does not keep much stock, the Red Poll has much to recommend it and has won favour overseas in North and South America and in countries in the British Empire.

Another breed which has gained a foothold in South Africa is the South Devon, the large, rather rangy beasts which you will see on the farms along the south coast of Devon and recognise at once by their peculiar gingery colour, unlike any other British breed. A point which recommends them to African farmers is that they can be used as trek-oxen.

The Welsh Black is listed as a dual-purpose animal, but is mainly a beef breed, a lively black beast rather on the small side, with longish, wicked-looking horns. It thrives on the thin hill pastures of Wales and is hardy enough to pass the winter out-of-doors on the blizzard-swept slopes of the Welsh hills.

The remaining two dual-purpose breeds—the Blue Albion and the White Park Cattle—are more in the nature of museum pieces. The former, despite the grandeur of its name, resembles a Shorthorn, except that it is a blue instead of a red roan. It is a manufactured rather than a naturally evolved breed, having been built up in comparatively recent times from a number of recognised breeds such as Shorthorns, Welsh Black and Friesians. Its home is in the Peak District of Derbyshire, but the numbers are so few that it will be a rare sight outside the stock-pens of one of the bigger agricultural shows.

Park Cattle have only recently been recognised by the Royal Agricultural Society of England as a separate breed and, as may be imagined, have little or no farm importance, however much sentimental interest may attach to them as pure-blooded survivals from a remote past. They are small with longish, sharp



A PARK BULL

horns and black muzzles and points. Occasionally a herd which has been kept pure for hundreds of years produces a black calf, an event which causes great interest and enthusiasm amongst students of heredity.

The important dairy breeds can be narrowed down to three—Friesians, Ayrshires and Channel Islanders, and in that order of importance. The Friesian is, of course, a foreigner, Dutch in origin and only English by adoption, but the British Friesian, through residence in this green and pleasant land, has already suffered an oversea change into something richer and stronger than its relations on the farms of Holland and the Friesian Isles. Inevitably, cattle of a Friesian type have been brought into England from time to time through the centuries, but the main influx did not begin until the second half of the nineteenth century, and not until the early 1900s was the breed really established here and had begun to develop.

The Friesian is entirely distinctive. It may vary in extreme cases from almost whole white to whole black—and officially the only essential qualification is that its feet must be white—but for all general purposes it is best described as a black and white animal which is unmistakable; moreover, it is much the largest of the purely milk breeds and next to the Shorthorn the most numerous and widely distributed breed of cattle in the world. Its merit lies in the quantity rather than the quality of the milk it gives, and Friesians hold most of the records for quantity, both in Britain and in the U.S.A. At the moment the blue riband of milking in Britain is held by a British Friesian cow, owned by a farmer at Ringwood in Hampshire, which in 1948 gave no fewer than 4,508 gallons in the year, easily beating the record of 4,164 gallons produced in 1940 by a Shorthorn Friesian, more often than other breeds, reach and exceed an average of 2,000 gallons a year, though the milk is not so rich, its butter content being well below the average. Although the Friesian is a hardy animal, as it must be to have developed on a flat treeless coast exposed to the winds brought across the North Sea from the Polar Regions, it produces its best results on rich pastures and does not show to advantage on the poorer grasses of upland or hilly grazings. You are therefore not likely to see many Friesians in the hilly districts of the North and indeed, as a general rule, you will find Friesians kept less by the small man with one or two cattle than in large herds by the big specialist dairy farmer.

The British counterpart of the Friesian is, of course, the Ayrshire, though whereas the Friesian is white and black the Ayrshire is white and brown. On other points it is a far more attractively shaped beast, with rather long horns that curve sharply upwards and are quite distinctive. The brown splotches vary from a light fawn to a dark brown brindled with black. There is no detailed history of how the breed was evolved, though it is probable that it is the outcome of admixtures of Shorthorns, Friesians and possibly Channel Island blood. Jersey blood, for example, would explain the dark brown brindled markings. It is a small animal which, developed as it has been in Scotland, is able to thrive on indifferent pasturage and yet give high yields of milk of a higher butter content than the Friesian, though without equalling the Friesian in quantity. It has in a short time earned great popularity in England and overseas, par-



ticularly in North America, New Zealand, South Africa and North Europe, and is a breed which you are likely to meet anywhere in Britain

Not so the Channel Island cattle. As natives of islands nearer the sun, they do not do well in northern climes. Indeed, you will seldom see either Jersey or Guernsey cattle in England north of the line of the River Trent. Overseas they are very popular in the U.S., New Zealand and Australia. They stand at the opposite end of the pole to the Friesian, and of all dairy breeds they are most famous for the quality of the milk they give. Though the number of gallons per year may not average more than 700, the average butter content for both the Jersey and Guernsey is likely to be 5.2 per cent and 4.7 per cent respectively as against only 3.2 per cent for the Friesian and 3.8 per cent for the Ayrshire. We have already described their appearance. You can always tell one from the other by the Jersey's "mealy" muzzle. Actually the Guernsey is usually of either



GUERNSEY COW

tawny yellow, fawn or light brown with white markings, whereas the Jersey tends to be more of a whole-coloured animal, though it may also be fawn, silver-grey, brown or dark brown brindled with black. Although both look the most mild-mannered and docile of cattle, the bulls are mischievous, to say the least, and certainly difficult and sometimes dangerous to handle.

The remaining three dairy breeds recognised by the R.A.S.E.—that is the two Irishmen, Kerry and Dexter and the Old Gloucester—are interesting but have little farm significance. The Kerry is a small type which you may possibly confuse with the Welsh Black, except that the Kerrys will be milch cows rather than bullocks kept for grazing. They are black in colour and have longish, sharp horns which, it may be said without injustice to Ireland, they know how to use, though perhaps less out of malice than from sheer high spirits. You may see them here and there in Britain, but they are not common and are seldom kept in dairy herds, being rather a poor man's cow which has the ability to

produce a reasonably efficient quantity of milk of good quality from poor grazing

If the Kerry is the smallest of the breeds we have so far mentioned, the Dexter is the dwarf of all our cattle and has all the stigmata of the dwarf, the wrinkled, old-looking face, the large head and the short legs. It is not much larger than an Irish wolfhound, and is black with turned-up horns like an Ayrshire. An idea of its size may be gained from the fact that two Dexters can live on the same acreage as one normal-size cow and indeed it is so hardy it will eat and thrive on almost anything, even the roughest moorland pastures. It would be the ideal cottager's cow if it were not for the fact that it is difficult to breed from and a large proportion of the calves are monsters, resembling bulldogs.

The Old Gloucester is a museum-piece, in the sense that there are probably not more than two hundred pure-bred specimens to be found in England today. These are mostly in herds kept by enthusiasts who champion the all-round utility as well as the docility of the breed and almost all of whom live in the Gloucestershire-Warwickshire area. The breed, which was officially revived in 1919, is certainly an ancient one, and is of a dark brown or brindled brown and black colour with a white line along the back and white along the belly. It can be used as a beef or milk animal and though the quantity it gives is not great by modern standards its quality appears to be especially suitable for the making of that famous but now, alas! almost extinct cheese, the Double Gloucester.

These, then, represent the twenty-two breeds which are in existence and all of which you may see if you are lucky. A few of them only are of major importance—those which are marked with a star in the list on page 120—but these are of world importance. Since 1945 they have been bought by Argentina, Brazil, Uruguay, Peru, Australia, New Zealand, South Africa, Soviet Russia, Rhodesia, Eire, Denmark, Sweden, Poland, Egypt, Cyprus, Ceylon and Madeira. In the early part of 1946, 125 head of British cattle were bought for export to U.S.A. and Canada alone for £60,000. The rest are "horses for courses" and most of them have their peculiar points of merit, which will appeal to this individual or that. But it must be confessed that there is much energy, time and money spent on a number of breeds which have ceased to have a value commensurate with the effort diverted to them. Local patriotics still, thank goodness, run high in Britain, and these are responsible in large part for zealously maintaining the purity and ensuring the continuance of the smaller and less adaptable breeds.

Cattle are kept on every farm. For one thing, without breeding there would be no milk. Heifers—females which have not yet borne a calf—are generally mated when they are from 20-30 months old, though some of the slower-maturing breeds will need to be as much as three years old. The period of gestation in cattle is 280 days, a few days over nine months, which means that heifers normally calve when they are about two years to thirty months old; the slower-maturing breeds being nearly four years. With dairy cattle, the farmer will plan to have a high percentage of his heifers calving in autumn, since this helps to spread milk over the year, as the autumn calvers will be milking when the spring mothers will be starting to dry off. A dairy cow's life is a hard and

a short one, the average milking life covering no more than seven lactations. After that period the cow's yield will begin to drop steeply and she will soon cease to give an economic return for the food she receives. The first-class dairy cow will give about 4½ gallons a day for the first four months after calving, then the yield will drop gradually to about 2 gallons at the eighth month, and so down to nothing at all about the tenth month. By this time she will be in calf again, and after being dry for about a month to six weeks, will then calve and start the same round over again. The food she is given will be weighed out according to the weight of milk she is producing. As we noted, she will require rations containing carbohydrate and protein for maintenance of health and production of milk. All sorts of foods will go to make up the two rations, but as the science of grass cultivation and conservation is better understood, grass in one form or another will occupy a more prominent place in the pro-



A DEXTER COW

duction ration, and the more this happens the happier will be the individual farmer and the richer the nation, since it will mean living more and more off our acres of incomparable grassland and being therefore forced to buy less cattle food from overseas. The heavy milkers which constitute the bulk of the modern dairy herds need extra protein to keep up their production even when grazing on rich spring and summer grass. Their rations will vary according to the size and weight of the cow as well as her yield of milk, the amount and quality of grass she is getting and so on. In winter, for example, a cow yielding four gallons of milk a day may get 20 lbs. of hay for maintenance and 16 lbs. of dairy cake for production. Half of the ration is given while she is being milked in early morning, and the remainder at the evening milking. The dairy cake may be a mixture containing equal parts of oats and linseed cake—fed at the rate of 4 lbs. per gallon of milk. In summer the farmer judges the feeding value of his pastures. If he decides that the cows can obtain sufficient fresh grass to supply

the nutrients for maintenance plus one gallon of milk, a four-gallon cow will only receive rations for three gallons of milk, i.e. 12 lbs. of dairy cake.

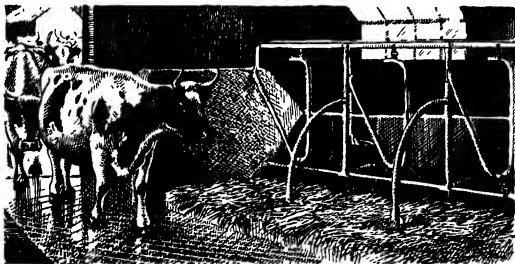
The foregoing applies only to the farmers who treat their cattle by modern methods. These are the men who not only make their farming pay, and so can afford to develop and improve their holdings and buy the best stock, all of which redounds to the prosperity of the nation; but they supply the public with the greatly increased quantities of clean milk which its health demands. There are still many farmers of the old school, especially the smaller men who keep no more than 4-5 cows, who pay little attention to dairy hygiene, who feed their cows either by rule of thumb or on what food they happen to have available, and who keep cows for milking till they are long past their production peaks and no longer give enough to show a profit on their keep. The modern dairy farm is a fine, clean and airy place—and so it may well be, for milk is at the same time one of our staple foods and a highly dangerous, organic product. It is the ideal carrier of disease, the perfect breeding-ground for bacteria. Consider how easily it is made to ferment into cheese, how even thundery weather will change it overnight from a clean, sweet drink into a sour, curdled fluid; add to this that the dairy cow's life is threatened and not infrequently shortened by many diseases, and it will be seen how imperatively necessary it is that every operation connected with milking and distributing the milk to the consumer should be kept as hygienic as possible. The principal diseases which affect the cow are tuberculosis, still the scourge of the dairy farmer and which affects you and I in the sense that it is passed on in the milk, mastitis, a serious inflammation of the udder, which first causes a drop in milk production and may necessitate the slaughter of the infected animal; and contagious abortion, which may run through a herd and cause cows and heifers to miscarry and drop their calves at an early stage in their pregnancy.

When I was a boy I had the run of a small grass farm about a mile from my home. The farmer, a contented but taciturn Yorkshireman, farmed a small Dales farm of probably 70 acres of grass-fields, no more than patches of grass enclosed in rough stone walls, which climbed steeply up to the moor where there were two fields which were supposed to have been reclaimed but in which the grasses were fighting a losing battle with the persistent heather. He was both our milkman and my father's church-warden, and on Sunday evenings he would appear at the Vicarage garbed in sombre black—black overcoat and a hard hat—but with the old-fashioned yoke round his neck from which hung two cans, in one of which was our week-end milk. He would leave the yoke and the cans by the back door and then walk on to church with my father. It was certainly a pleasant echo from an earlier day, and his farming methods also were those of his father and of his grandfather's before him. How he any more than any of these small Dales farmers paid their way is a riddle, the answer to which I now suspect is that they not infrequently did not. My friend had perhaps five cows which he turned out to graze in summer and for whose winter maintenance he made hay, grew a patch of roots and bought some concentrated cake. The farmstead was the usual square, grey-stone building attached to the barn. After the tradition of Yorkshire his home was comfortable and spotless. How



many happy hours I spent in that kitchen, with its rag rug in front of the shining, open range, which was black-leaded every week and its steel parts burnished with emery polish. On the mantelpiece stood a collection of brass tins, each of which shone with elbow-grease and winked where the industrious housewife had made a pattern of thumb-marks.

With all this attention to human cleanliness went a complete disregard of elementary cleanliness on the farm. The need to apply the same rules to animals as to humans had then never occurred to the ordinary farmer: nor indeed has it to all even to-day. The cows were kept in the low cowshed or mistal in semi-darkness. The window was very small and covered with cobwebs. The wood posts of the stalls shone with the polish acquired by years of handling or the rubbing of cows' flanks, but they were also caked with patches of dry dung. The walls were likewise splashed with dung, and though the uneven stone floors



MODERN COW STALLS

were brushed after each milking, they were seldom washed. At milking-time the farmer, who had likely been mucking-out the pigs before he went to fetch in the cows, pulled up his stool, twisted his cap round, peak sideways, and went into action on the first cow without ever thinking to wash his hands. Yet even if the cow is free from all disease, the milker's hands can both infect the milk and pass disease from an infected cow to a healthy one. Much less was there any thought of cleansing the tail, udder or flanks of the cow to be milked, and which are not uncommonly splashed with dung, though the milk pail would certainly have been scalded out since the previous milking. There is no doubt in my mind that the warmth, the snugness, the half-light and the heavy, ammonia-laden atmosphere of these old-type cowsheds have a sentimental attraction for the town-dweller, which blinds him to the fact that they are as much a blot on modern standards as the slums of our great cities. They are his idea of the country, just as the beauty of a tumbledown cottage over whose

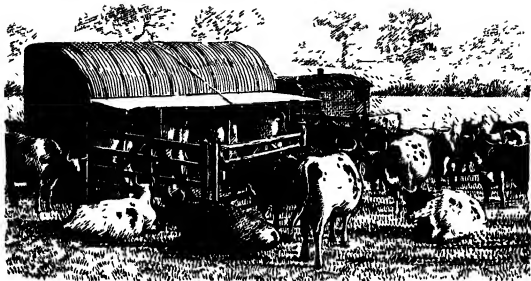
ancient, tattered thatch climbs a trail of gay nasturtiums or pink honeysuckle, may excite his admiration, when it is probably a condemned dwelling, literally unfit, if not unsafe, for human habitation

The modern dairy farm has something of the cold, impersonal efficiency of a hospital. For one thing, it embodies the realisation that beasts as well as humans need light and air—fresh air—and that close, fuggy atmospheres are no healthier for cattle than for children. The milking sheds are laid out scientifically, lit probably by electricity, with long windows and connected with an ample supply of water so that they can be swilled down with disinfectant between each milking. Cows are heavy drinkers, and so that there shall be no risk of water-borne infection, they will not be watered by bucket, but each stall will be provided with a small basin into which water flows as soon as the cow indicates, by pressing its nose into it, that it wants to drink. Just before they are milked the cows' udders, flanks and tail will be wiped clean with a cloth soaked in disinfectant. If milking is done by hand—and this is not likely if the herd is a large one—the milkers will finally wash their hands in disinfectant before beginning, and, like surgeons at an operating table, put on a white coat and linen cap, to stop hairs falling into the pail. If milking is done by a machine, this, together with all the pails, will have been completely sterilised by steam. As a final precaution against spreading mastitis, the teats of each cow are inspected and a sample of milk taken from each and examined for signs of the disease. This is only a rough description of the precautions that are now thought necessary to safeguard the health of the dairy herd, and therefore of the public who consume the milk. It does, however, indicate how changed is the scene, and how the march of progress has taken some of the romance—with most of the dirt—out of dairy farming.

The majority of British dairy farmers still regard grass as the basis of their herd's food. Some breeds are hardy enough to spend all winter out of doors—probably a majority do so in South England—where they are fed, after the grass has died, by silage, hay or mangolds scattered on the meadows. The others are brought in during the winter months, either for the whole winter, or possibly only at night. In the summer they will go out on the pastures to get their food by grazing. There are two variations to this rule. In the arable counties there is a school of thought which contends that a milch cow does not need to go out of doors other than for a short daily exercise, like a convict has his daily walk round the prison-yard. Some farmers in East Anglia contrive to maintain substantial dairy herds with practically



MILKING, MODERN STYLE



A MILKING BAIL

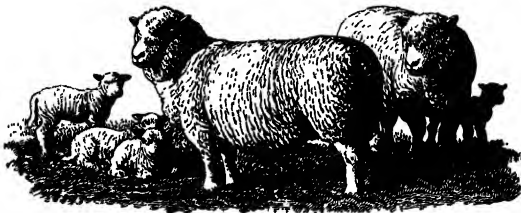
no grassland They keep their cows indoors all the year round, except for exercise, and feed them on roots, sugar-beet pulp, dried grass and hay At the other end of the scale is the all-out-of-doors school, which has been developed in Wiltshire by Mr A. J. Hosier. The dairy cows are allowed to range the pastures throughout the twelve months and, instead of being brought in for milking, the milking stalls are brought out to them These are portable affairs known as "bails," and while the beasts are being milked they are given their rations of concentrated foods This is a system which, naturally, is only practicable in a moderately dry and temperate district, but is most economical in labour, in water and in foodstuffs It is about the only detail of the whole business of milk production that you are in any way likely to see on either side of your road

I will end, as I began, by repeating that if you are interested to know the why and wherefore of dairy or beef farming, or indeed of the various breeds and types of cattle you see as you travel the country, you must follow them into the farms and the show-pens and watch at close quarters all that goes on from sun-up to sun-down on every day of the 365 of the year

There is one recent development connected with dairy cattle that may complicate your task of recognising one breed from another It has been established beyond all gainsaying that horns are expensive weapons in a dairy herd The heifers and milch cows of a horned breed cannot resist using their horns on one another in yard or stall. Heifers in calf are not infrequently horned so seriously that they miscarry or even die A farming friend of mine estimates that the main cause of udder troubles is the horning of one cow by another. He told me that in his herd—a small one—horns cost him over £300 per year. The charge is made against all the horned milk breeds—Shorthorns, Ayrshires, Jerseys and Guernseys—but especially against the Ayrshires, whose horns are particularly sharp and businesslike weapons, and who seem readiest to use them. The result

is that an increasing number of farmers in this country and elsewhere are de-horning their herds. This may be done by breeding, by preventing horns growing in the calves or by removing the horns of adult animals. The objections to doing it by breeding are that it is a relatively lengthy process, some years being necessary to produce a polled herd, and one also which involves upsetting the pedigree of the herd, since it must be done by mating the horned cows and heifers with a bull from one of the polled breeds. A quicker and more all-round efficient method is to stop the budding horns of calves from growing. This is done by an electrical cauterising apparatus which effectively stops growth without pain. The quickest but least acceptable method is to remove the horns of grown beasts, and it is the fact that this is being done by the help of anaesthetics, without pain to the animal. More surprising is the evidence that removal of horns has resulted in a quietening of the cows's disposition, and that in almost every case it has had no bad effect on the milk yield.

The moral seems to be that horns were provided to enable the animals in their wild state to defend themselves, and clear a passage through other animals to the water-hole. So long as the cow has its horns it will, it seems, use them as Nature intended, even though it is no longer a forest ruminant but a perambulating milk factory. Remove the horns, and the fact is accepted with an increase in docility and gentleness. Considerable attention was focused on this danger from horns when Champion Bargower Cherry, the queen of the 1947 London Dairy Show, was gored and killed by a herd companion in 1948. But I cannot say that a polled Ayrshire is a beautiful beast. It looks wrong. See whether it looks odd to you if you come across any of these cleanly, fresh-looking brown and white cattle without their upcurving blades of horns. If the movement spreads, other breeds may be affected, and you may see polled Jerseys or Shorthorns. Anyway, should this happen you will know the reason why.



CHAPTER THIRTEEN

SHEEP AND SHEPHERDS

SHEEP are neither so numerous, nor do they fill so important a place in the farm economy of Britain as formerly. There are many contributory reasons for this decline. One is the change that has taken place in the general farming scheme. Firstly, there is the big contraction of the grass acreage due to the ploughing-up of grassland to enable the country to grow more arable crops. Secondly, the spread of education has meant that the bag of mineral fertilizer has replaced the golden hoof. The farmer now realises he can give his land the nitrogen, phosphates and potash it needs for fertility, both more cheaply and more efficiently by buying these essentials in the right proportions in a sack, than allowing the sheep to supply some of them haphazardly in the course of Nature. Rising labour costs are another factor. Folded sheep especially need the constant skilled labour of shepherds, and labour is to-day the most expensive item on the farm. Lastly, whereas in the past England was a wool-growing as well as a woollen-manufacturing country, to-day British mills rely more on the improved but imported staple from that superlatively fine Spanish producer of wool, the Merino, or from a cross between the Merino and our Lincoln or one of the Downs breeds. British sheep are now bred for mutton rather than wool. Lastly, we seem as a nation to have lost our grandfathers' liking for fat meat. In their day the best mutton was a large joint with plenty of fat which, unless the plate was very hot, of course, soon congealed into candle-grease. Nowadays the public taste has changed and prefers smaller joints with a minimum of fat. That, of course, means that the farmer is encouraged to keep the smaller breeds of sheep and neglect the big fellows, which are mostly of the lowland types.

The fact remains that there are fewer sheep on lowland farms than ever there used to be in the past, and this must be a matter for regret, since sheep are most characteristic of British farming. Indeed, the astonishing fact about sheep is that although Great Britain is, next to little Belgium and Holland, the most densely populated country in Europe and only a small island at that, she supports, in normal times, more sheep than the whole of the rest of Europe put together. You will soon realise this if you watch what is passing on both sides of the road on the Continent, where you will seldom see sheep in numbers comparable to those you will pass in England, Scotland or Wales. Another interesting fact is that the British sheep population rises as the prosperity of her agriculture declines. It is as if in times of depression the British farmer turns towards the animal which has, throughout history, represented one of the main sources of his national prosperity.

In the beginning, Britain was a wool-growing and a wool-exporting country, sending wool over to the Low Countries and France to be woven. Then it became a wool-weaving country itself, and its thriving woollen industry attracted to Britain refugees from France and the Low Countries. To-day, British woollen goods are one of the most important of our high quality exports to the world—West Riding serges, Witney blankets, Scottish, Welsh and West of England tweeds, Shetland and Harris tweeds, Fair-Isle jumpers, West Country flannels and the rest. The fact that our sheep population is now low may in one sense be taken to indicate the healthy state of British agriculture, but it is also evidence of the tragic losses caused by the winter of 1946-47. Up till that year, though lowland sheep had been declining, the numbers of hill and mountain sheep had been steadily increasing. Then came the disastrous first quarter of 1947, when no fewer than 4½ million of our hill sheep died. This was a blow from which it will take British agriculture a long time to recover.

There are at least thirty-three separate breeds of sheep in the British Isles. To describe each one of these would be to lead you into an unnecessary welter of detail. With certain main differences, such as horned or hornless, black-faced or white, one sheep is very much like another, and the distinction between some of the breeds is so fine that it is doubtful if you could, without a book of reference in your hands, distinguish one from another. Add to this that there is nowadays so much cross-breeding that it is almost impossible to identify the majority of the sheep you are likely to come across as belonging to one breed or another. As with cattle, the solution is to go to the "Royal" with a book of reference, identify the different breeds you see in the pens and then memorise their characteristics so that you will recognise them when you see them climbing some craggy slope or folded on some autumnal field of cabbages.

It is, however, practicable to describe the main types, to one or other of which all the varied breeds will belong. In addition to the two main divisions of mountain and lowland sheep, the lowland sheep may be further sub-divided into long wools and short wools. You may tell the long-wool from the short-wool breeds, not so much by the length of the wool as by its texture. The long-wools do, of course, grow longer wool, but it is its looseness and shagginess rather than its length which contrasts with the tight, crimped and almost curly

wool of the short-wools. All the long-wools have a sort of bald white head poking out of the shaggy overcoat, while most of the short-wools have tight wool drawn over their head and cheeks like a Balaclava helmet. Similarly, the legs of the long-wools, or as much as you can see of them, are bare and white, while most of the short-wools are black or have woolly gaiters to the hoof. These are only rough generalisations, but if you watch the way the wool grows you should soon be able to place a sheep in one category or the other.

The long-wools are the modern representatives of the animals on which much of the prosperity of medieval England turned, and whose fleeces built the cathedral-like churches which still ornament the villages of the eastern counties, monuments to a vanished prosperity based on wool. They include the Leicester, Border Leicester, Wensleydale, Lincoln, Cotswold, Devon Longwool, South Devon, Kent or Romney Marsh and Roscommon breeds. These are large animals, and all except the Wensleydale—which has a blue-grey face and legs—are white-faced and hornless.

The short-wools are more heterogeneous and can be further subdivided into the Downs breeds and the others. The Downs sheep number the Southdown, Shropshire, Hampshire Down, Dorset Down, Oxford Down and the Suffolk. They are all hornless with short, close wool. Of these you will recognise the Southdown, Hampshire Down and Shropshire, because their faces are covered

with wool like a teddy-bear instead of being bare and black, though, here again, there is a minor difference in that the Southdowns' wool ends in a mouse-grey nose and the other two in black ones. The other breeds bear little resemblance to one another. The Dorset Horn and the Wiltshire or Western Horn are white-faced but with large horns; the Ryeland and the Devon Closewool are white-faced but hornless, the Kerry Hill—which is Welsh and not Irish—is speckle-faced and hornless, the Clun Forest—a local Shropshire breed—is dark-faced and hornless, and the Radnor brown or tan-faced and hornless. The Suffolk is a bit of a mixture, because although classed as one of the Downs breeds, it is a folded sheep



KENT OR ROMNEY MARSH RAM



LINCOLN LONGWOOL RAM



BORDER LEICESTER RAM

kept in the arable counties of East Anglia. It is identifiable by its coal-black face and legs and its rather drooping, lop-ears, which give it a somewhat lugubrious appearance. The Hampshire Down also has lop-ears but its face is, as I have said, woolly.

Which of these are the important breeds in the sense that the Shorthorn and the Hereford are important breeds of cattle? This is a delicate question. It is difficult to generalise about sheep because they are the subject of local patriotisms

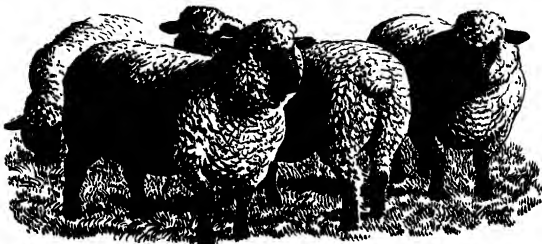
amounting almost to parochial prejudices and because, as a generalisation, each breed seems best suited to its own district and generally confined to it. There are few pure breeds of sheep, which are distributed up and down the country. On the other hand, many of the breeds which are localised and few in number in Britain—are widely scattered over the world in countries which specialise in wool-growing.

Of the long-wools you can say with certainty that the Border Leicester is important, both at home and abroad. You will see it, or its near relation, the Half-bred, which, as you may remember, is a cross between the Border Leicester and the Cheviot, almost anywhere in Britain; and the Lincoln and Romney Marsh are well known overseas. Of the short-wools, the Southdown, the Oxford Down, the Dorset Horn and the Suffolk are well known in their respective areas of England and also overseas; and of the mountain breeds, the most important are the Black-face, the Welsh mountain and the Cheviot.

For a sheep that emanates from a country of hill grazings the Border Leicester has a decidedly lowland air—it is a large animal, long in the leg with a heavy fleece, a white face and a decidedly Roman nose. It is an evolution from the old Leicester long-wool, one of the earliest breeds of sheep to be improved by selective breeding by the great Bakewell. The breed is so named because it derives from Leicestershire sheep taken into the Cheviot district of the Scottish border about a hundred years or so ago. From the Cheviot country, of course, comes also the famous Half-bred, which we have already mentioned more than once, and which is to be seen all over the grass pastures of the Midlands and Southern England. Despite its name it is to-day established as a valuable breed, popular on account of its fecundity, the strong maternal instincts of the ewes, and its hardiness and ability to thrive on unpromising grazings.

In the North Midlands, on the cold grass and limestone wolds of Lincolnshire and down as far as Peterborough, you may see some Lincolns. They are unlikely to be in large numbers because this fine big white sheep, the biggest of





OXFORD DOWN EWES

our native breeds, is not in such favour with farmers at home as it was once—wool is no longer a prime consideration and coarse, fatty mutton is not wanted—though it is popular overseas, where it is crossed with the Merino to give first-class wool. Much the same story may be told about the Kent or Romney Marsh sheep, though this is perhaps even less widely distributed in England than the Lincoln. It hails, as its name indicates, from that ancient district of Kent which once witnessed the hustle and prosperity of the Cinque Ports, but where the sea is receding so fast that sheep now graze in the lush grasses where once carracks and caravels rode to their anchors. It is one of the famous sheep-rearing districts of England, as will be obvious to you if you pass through it, and sends its fine-woolled sheep all over the world, but especially to New Zealand, Australia and South America—and the Falkland Islands in particular. Like all the long-wools, the Romney Marsh is hornless and white-faced, and has rather a benevolent mien with ears fixed horizontally on either side of its head. Both it and the Lincoln have been bought by the Soviet Government to repopulate the sheep-farms of the war-devastated Ukraine.

Of the important short-wools, you may find the Southdown on farms in many places in the Sussex, Surrey and Hampshire district, though it originates, as its name indicates, from the high chalk and close-grass slopes of the South Downs in Sussex. It is the smallest of the Downland breeds, and little more than half the size of the big Lincoln. It has a wide, squarish head and a woolly face, though the wool does not grow round the eyes or round the nose and mouth. It is thick on the cheeks, which remind me of some of those portraits of Victorian gentlemen with bushy side-whiskers. The ears are short and are also covered with short, close wool. Southdown mutton is famous, and the Southdown is one of the breeds that combine fine wool with sweet, small joints of mutton. The Oxford Down is not a true Downland sheep and was evolved comparatively recently, about 100 years ago to be precise, by an admixture of long-wool blood from the Cotswolds, and this shows plainly to-day in the large size of the animal, in the coarseness of its wool and in its shaggy appearance, accentuated

by the ragged fringe of wool on its forehead. It is one of the more widely distributed breeds and has earned considerable popularity overseas. The Dorset Horn is a breed of great antiquity, which, with its heavy horns—both ewes and rams are horned, by the way—always seems as if it should belong to the north instead of the grazings of the lowlands round Wareham and in the Isle of Purbeck. Indeed, it looks more like one of the wild Rocky Mountain sheep than any other British breed. It is not very large and has a white face with a pinky nose. The ewes are very prolific and are usually mated in spring so that the clever farmer may have small, fat Dorset Horn lambs ready for sale by Christmas. The production of this early lamb is not so profitable as formerly, owing to the developments in refrigeration, which enable imports of frozen lamb to come in all the year round from New Zealand (the famous Canterbury lamb comes from the Canterbury in New Zealand and not in Kent) or South America, so that the



DORSET HORN EWE AND LAMBS

Dorset Horn breed is not perhaps so much kept by farmers as it once was. It has been widely exported to North America, Australia and New Zealand, and in New South Wales efforts are being made to evolve a hornless Dorset Horn. This is being done by way of breeding out the horns, by crossing the Dorset Horns with another British breed also established in Australia, the Ryeland. The Ryeland hails originally from the Welsh borders, but is not seen much in England except at shows or in the immediate neighbourhood. One generation of the Dorset Horn-Ryeland cross has already been produced, but at least five generations will have to be bred before exact conclusions can be drawn.

The Suffolk, as I have said, is a freak in that it is a Downland breed which nevertheless inhabits the most un-Down-like of country, and flourishes in folds on the cabbages, mangolds and kales of the Eastern Counties. It is one of the easiest of British sheep to identify, a largish animal, with a long, glossy, coal-black head, quite free of wool, and equally glossy, coal-black legs. It has also a long neck which gives it a most comical appearance, especially when newly-

shorn. Its wool is of good quality and it makes excellent lean mutton, comparing favourably with that of the Southdown and Mountain breeds. Its merits seem to be becoming recognised all over Britain, and not long ago I sat in an old inn up in the Cheviots and listened to an eighty-year-old shepherd declaiming the virtues of these Southern black-faces which were being sent up to mate with his white-faced Cheviot ewes. Suffolks may be met with in many parts of England and Scotland, and overseas have established reputations in South Africa, East Africa and South America, particularly Chile

Of the mountain breeds, the Blackface is probably both the most widely distributed and the best known. It is a small animal, with such coarse long wool that as it moves it looks like a perambulating wool bale, dragging along all sorts of pieces of gorse, thorn, or bracken that have caught up in its fleece. Its face is black or speckled black and white, and both sexes carry horns. The ram grows the most massive horns of any breed of sheep, magnificent weapons which turn in a complete circle, the sharp tips forming an extra segment pointing upward and outward, and they grow so heavy that they have sometimes to be cut out underneath to keep them out of the animal's eyes. Nowadays the Black-face is associated, like the Highland cattle, with the mountains of Scotland, where it exists and thrives in large numbers. As a matter of history, however, it is fair to record that, though it has been established north of the Border for per-



A SWALEDALE RAM

haps 200 years, its place of origin is the Pennine country of Northern England, which is indeed the great cradle of British hill sheep, and whence sprang such breeds as the Wensleydale, the Swaledale, the Lonk, the Roughfell, the Derbyshire Gristone, and the Masham as well as the Blackface. It was among these Blackfaced sheep that I grew up as a boy among the Yorkshire moors, sheep whose skulls and skeletons we used to find whitening beside the moorland streams, evidence of losses probably during the lambing season. Their wool is so coarse that it is only used for making into carpets and rugs, but the mutton is excellent, small and sweet. Welsh mutton has been famous throughout the centuries, and this comes principally from the Welsh mountain herd, the smallest of all British sheep. It is a very old breed, indigenous to the country. It is white-faced and only the males carry horns. Although classed among the mountain sheep, the Cheviot always seems to me to resemble one of the folded types as much as the Dorset Horn does a mountain breed. I would prefer to call it a hill sheep, and indeed there is a vast difference between the wide, rolling Cheviot hills with

their coarse grass covering, and the frowning rock and heather mountains of the Highlands and Snowdonia. The pure Cheviot breed is a medium-to-small animal with a heavy fleece, and a white face with sharp ears and an alert expression. There are two strains of the breed—the one in the district from which it takes its name, and the other farther north in Scotland, in Caithness and Sutherland. It is not a sheep you are likely to meet in many places south of the Scottish border, though you may see it throughout Scotland, and in some hilly districts in England and Wales. It has an established reputation in Canada and the U.S.A. Remember—if you see a smallish, white-faced sheep with prick ears and an alert look, you can reasonably write it down in your notebook as a Cheviot.

There are many breeds of sheep which we might mention on account of their peculiarities or their interesting histories, but we have space for four only—the Herdwick, the Shetland, the Barbary or Jacobs sheep, and the Lonk—though I choose none of them for their agricultural or farming importance, which is



WELSH MOUNTAIN SHEEP

small. The Herdwick is a small mountain breed confined to the screes and fells of the Lake District of Cumberland. No one knows with certainty how it arrived in this corner of England, though there is a tradition that its ancestors were survivors from a Scottish or Norwegian ship wrecked on the coast of Cumberland some 200-300 years ago. The facts are that it is the hardest of all British breeds, able to subsist on a diet of heather and moorland grasses, and its fleece is the coarsest. The ewes are hornless, and so sometimes are the rams. It was in the Herdwick breed that Miss Beatrix Potter interested herself when she settled down to farming in Lakeland after writing the children's books for which she is famous.

The Shetland deserves a mention because it is from its soft wool that are made the famous Shetland and Fair-Isle scarves, shawls and jumpers. It is a small breed, which shows unusual variations in colour. It may, for example, be white, black, grey or even brown. It is horned and sometimes its grey or brown may be marked by white spots. It is not an animal you are likely to see except in the Shetlands, Orkneys and the extreme North of Scotland.

The Lonk I include solely because of its odd name, which seems somehow to



describe its appearance, for it is a large, long-legged, gawky sheep with a black and white face and a pronounced Roman nose, like the Border Leicester. You may come across specimens almost anywhere in the Pennines through Yorkshire and Lancashire and down into North Derbyshire, but it will not be numerous, and I confess that most Lonks I have seen have been in shows. Lastly, there is the little Barbary or Jacobs sheep, which can be described as the sheep counterpart to the White Park Cattle. They are ornamental rather than useful. But they are quite unmistakable and look as if they were a cross between a sheep and a goat, were such a hybrid possible. They are small and covered with large black spots or splodges exactly like the traditional sheep to be found among the wooden animals in the old-fashioned Noah's Ark. Also many of them have four horns. These, which are carried by both sexes, are in two pairs. The first are no more than prongs which stuck out like a goat's horns from the top of the animal's head, while the second, though not very long, are more typical of sheep's horns, and grow out in a gentle downward curve from the side of the head.

Sheep never seem to me to be either very lovable or very interesting animals. Worse, I associate them with a species of smells which are particularly distasteful to me, the smell of wet wool, bad enough when it has been scoured and woven into a blanket or khaki serge, but repulsive when greasy and dirty and attached to the hot body of the animal. For a number of years of my childhood when my father was vicar of a slum parish of Bradford, we lived surrounded by gaunt woollen and shoddy mills. Of all the ugly smells of that ugly and depressing region—of fried fish-shops, untrapped sewers and the exhalations from the dye-works—the smells from the mills as they ran off the water in which the fleeces had been scoured was paramount, a smell which would penetrate anywhere and permeate any room, clinging to curtains or to upholstery with a dreadful affinity. It was always referred to in the family as "ye smelle," the smell of smells, against which every window in the house had to be shut on the instant. Peter, too, will remember how once walking along a road in West Suffolk in winter our

nostrils were suddenly afflicted with a very pungent and disgusting effluvia, which we soon found blew upon us from sheep in a field which was a barren of churned mud but which the day before had stood green with cabbages. Here was the perfect blend of cabbage water and dirty, hot wool.

Despite these olfactory objections, which I am ready to confess do not, of course, operate over a certain distance, sheep somehow associate themselves with my more vivid mental pictures of the British countryside. A very early memory is of meeting a large flock, a thousand and more, of Blackfaced sheep in a road leading down from the moors above Pateley Bridge in Nidderdale. The narrow channel between the dry stone walls was filled with a nodding torrent of animals, black-faced and carrying horns like ribbed scimitars. On a sturdy pony a long way in rear rode the shepherd; before him his three dogs jumped the walls and raced on ahead to appear and bar the way at each gateway or side-turning. It was they who did all the work, who saw that the flock was kept steadily on the move, without being harried or hustled, who steered it along the right road and allowed neither wanderers nor stragglers; and all without



SHETLAND SHEEP

fuss or shouted orders. The shepherd rode in silence, and the most he did by way of command was to utter strange sounds in a conversational tone or blow low whistles through his front teeth; every one of which his dogs understood and acted upon instantly and with an eagerness as plain as it was sustained.

Mention of sheep-dogs evokes memories of North Country sheep-dog trials held on flat meadow or park lands beneath high, wooded hills or rocky fells, and also a Suffolk shepherd who used a pond in my garden to show off his dog's obedience. The shepherd would call the dog to the edge and then emit a sound which is vulgarly and colloquially known as a "raspberry," whereupon the dog would leap into the air, land with a splash in the water and start swimming round in circles, its eyes fixed on its master and its ears cocked for the next command. Nothing directly to do with sheep, of course, but an example of the near-human understanding to which the shepherd's dog attains.

My next memory is of a summer day in the Yorkshire Dales. My brother and I had climbed to the summit of Mewfa Hill and there, miles from anywhere, where we had boyishly imagined ourselves as explorers bursting into a virgin solitude, we found an old shepherd. Our chagrin at being forestalled in that remote and lovely place quickly passed to delight in his company. We ate our

sandwiches, then lay on our stomachs and scabbled our fingers idly in the warm, peaty, silver-sand, and among the lithe, twisted stalks of the heather, and the sun played on our backs as we listened to his talk. Below us and away out of sight, the moors were spread in widening ripples of russet and amber and violet. "How many sheep canst 'a see, young lad?" he asked suddenly, and when, after scanning the expanse with eager eyes, we said a score, there came the slow reply, "Ay, and then some. Tha'd never do at this job. Ah can maake out seventy from where ah sit, and I've ovver two hunnerd on t'moor."

Another is of the main road from Greta to Moffat through the Beattock Pass. I was going by car then, and my attention was caught by the way the round hills humped themselves up into the sun, so that the light playing on the bent grasses transformed them into tumbled heaps of velvet, on which the sheep were tiny, grey-white specks crawling like ticks on a rug. Of the same order is a mental image left by a journey through the mountains of North Wales on a day of mist and rain. The road climbed steeply, edged sharply round sheer bastions of rock, then dropped to sudden valleys where swollen streams frothed and swirled, while all around and above was the music of running water. Suddenly a puff of wind, parting the fleecy veil, revealed the heights, deep blue and menacing, which towered over the road, the gushing springs hanging like strands of white wool from the dark face of the rock. On these sombre, dripping slopes moved the sheep, surely and unconcernedly, though now and then, for all the neatness of their foothold, they dislodged pieces of slate which fell clattering down the abyss. Sheep crossed and recrossed the road and watched our passage with wondering eyes, stamping a hoof in doubt as to whether to stand or fly. They were little sheep, white-faced and hornless, and at first I wondered why, till I remembered that in the Welsh mountain breeds it is only the rams that have horns.

If these are memories of the sheep of hill or mountain it is because more of my life has been spent among these hardy, unconfined breeds, which thrive on the sparse, coarse herbage of the high hills or mountain-sides, but I treasure memories as vivid of southern sheep; though by contrast these need the care and attention of the shepherd as guardian, nurse and doctor. Most of them are associated with folded sheep, and particularly the black-vised Suffolks. Two stand out from the rest. The one is a day of high summer, the sky sullen with heat, the earth baked to the hardness of brick. The sheep, fat, prop-legged matrons, are quivering, panting, stinking bundles of wool. They are penned



A LONK RAM

in a fold of wire-netting and stakes, instead of the traditional hurdles, and though this was enclosed but yesterday, it has already been stripped of green as thoroughly as by any horde of locusts.

All morning the shepherd has been busy among them, filling their water-trough from the ancient iron tank on wheels, in which all water must be brought from the farm, for hereabouts are no springs and brooks but only ponds which dry out in summer; and watching them carefully to detect any that may be fly-blown. One blow-fly may lay so many eggs in a sheep's fleece that in twenty-four hours the heat will have hatched them, and the wool have become a writhing mass of maggots. So each day the flock must be inspected. If the shepherd sees a sheep standing apart from the others, and nervously twitching its stump tail, he will know she has been blown, and must be caught and treated. He has need for much energy and strength to dash in, seize and hold the afflicted of his flock—which may number a score or more a day in hot weather—while he doctors them by rubbing them with mercuric chloride from the black bottle which seems as much the shepherd's symbol of office to-day as was his crook of old. Now, at the afternoon's end, he is beginning the real, hard part of his labours, staking to-morrow's fold, which means driving from 200-400 stakes over a foot into that shard-like earth. I have a sharp picture in my mind of how he brushed the sweat out of his eyes with a hand which shook with over-exertion.

The other memory is of a Sunday in March. I had promised to visit a shepherd in his hut, a square, wooden, hen-coop-like box on wheels, of which you will surely see many in the southern and eastern parts of England, where he sleeps and eats and has his being during the lambing, which may last from four to nine weeks, from early January to mid-April, according to the locality. It was a wild day of driving snow, a morning still black at ten o'clock, and I had to butt my way against the gale, my wellingtons crackling into half-frozen mud under the six inches of snow. Pushing my way into the hut, I found the shepherd huddled by the stove, sipping some dregs of tea straight out of a scalding saucpan while the steam rose from his sopping garments. At lambing-time the shepherd must be on duty every hour of the twenty-four, in and out of his hut continuously day and night, alternately soaked to the marrow of his bones and parboiled in his clothes, like a pudding in its cloth. Once a week, if he is lucky, he can get back to his cottage, a bath and a square meal, but this is, of course, his harvest-time. The number of lambs he helps into the world and rears for the big lamb sales of mid-summer will largely determine his pay for the year. Yet, for all that it has its slack periods and its compensations, his is surely one of the nation's heavier trades. Last night, he tells me, twenty-five ewes lambed.

Together we go out and inspect the lambing-pens, those comfortable, warm shelters of clean straw and hurdles and netting, built by the shepherd and his apprentices, which you will notice in the fields in early spring. They resemble diminutive, walled towns and afford a good example of the craftsmanship which still exists in farming even in these days. As we walk round he keeps up a commentary on the inmates, pointing out the deficiencies of this ewe "do you look—she ain't got no teeth," or the maternal shortcomings of that "Darned old fool, she won't stand up." Suddenly he lifts his head to the storm, sniffs, and





SHEEP DIPPING

yells "Lambing, Albert" to the boy working with him Then to me, "Do you know, I can always smell when one is going to lamb I'm never wrong I can smell 'em even in the hut " This, I reflected, was uncanny, especially remembering the many and rank smells of these folded sheep, long association with which might have been expected to blunt the sense of the ordinary mortal.

It must not be understood from the foregoing that mountain sheep are so hardy and resourceful that they do not need the shepherd's care. They do, but in a different way. They need guidance in their grazing habits at all times, and somewhat of the same maternity service at lambing-time as the most cosseted of the folded breeds. Their habit is normally to sleep at nights on the hilltops, to descend the mountain slopes at dawn and then slowly graze upwards until they reach the tops again towards evening. It is the shepherd's duty and interest to see that they follow this routine and, above all, that they do not grow lazy and remain on the lower slopes. These are the sheep's food reserves against the hard and inclement months of the year when the tops will lie deep in snow. Accordingly, the lower grazing levels must not be eaten off in the good days.

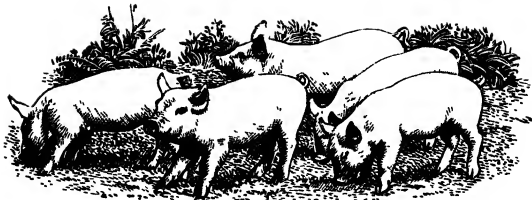
Lambing is a trying time for the hill shepherd as for the lowlander. If the ewes begin to lamb as late as April or May, as they do in Scotland, they may get by without serious trouble, but farther south, on the Pennines or in Wales, they often start as early as March, when the danger of snow or blizzard is by no means past. Indeed it frequently happens that a belated blast of arctic weather arrives in the middle of the lambing, involving desperate work to gather the ewes, heavy with lamb, from off the tops and to assemble them in the comparative shelter of the stone-walled lambing field lower down the slopes, to dig

out those which have already been buried under snowdrifts and to succour lambs newly born in the ice and snow and rain. The shepherd not only battles against the fury of the elements in those exposed heights and against the obstinacy and stupidity of the sheep, but against all kinds of predatory beasts, from the foxes which tear the entrails out of the lambs or cut the throats of the mothers from the sheer lust of killing, to the carrion crow which will pick the eyes out of the living lamb, and the weasel which will take advantage of its weakness from wet and cold to suck the blood out of it as it lies helpless.

As a matter of interest, sheep can live without hurt for days in deep snowdrifts, the snow being porous, their breathing is not seriously hindered and the warmth of their bodies forming a cave in the drift and clearing the snow away from the herbage so that, although imprisoned, they can find a little grazing to stave off complete exhaustion.

The period of gestation in sheep is roughly five months, and the ewe normally has her first lamb when she is about two years old. You should know some of the names by which sheep are known on the farm at various stages of their growth. These differ as between the north and south and vary slightly from one district to another. Generally speaking, lambs are born in early spring, and there used to be strong competition among farmers to have their ewes lamb as early as possible so that they might profit by the high prices made by "early spring lamb." This explains the popularity of the Dorset Horn breed, which mates in spring and produces lambs by Christmas the same year. Most lambs arrive between March and May. For some reason my mental picture of lambs is always against a background of snow, the new-born showing yellow against it, with its comical black nose and those sprawling, knock-kneed but clumsily big legs which remind me of the over-padded extremities of our professional footballers. Say the lamb arrives in March, how long does it remain a lamb? The answer is, certainly until it has been weaned and probably until it is six months old, after which it will be known as a hogg in the North of England and a teg in the South. If it is a male it will be a ram-hogg, if a gelded male it will be a wether-hogg and if a female it will be a ewe-hogg. The next spring the lamb will be sheared with the rest of the flock and it will then become a shearling, a ram-shearling or wether-shearling; a female shearling will be known as a gimmer or, in the South, a theave. Sheep which have been shorn twice will be known as two-shear ewes, wethers and so on.

In summer the sheep are dipped to cleanse the wool and to clear the fleece of the ticks and other vermin with which all breeds are afflicted. It may happen that you will see sheep by the roadside which are of an orange or saffron colour. This will either mean that they have been treated with a dip containing a colouring matter or else that they are ewes which have been mated. It is the practice to treat the chest and forelegs of the ram with colour so that the farmer shall know which of his ewes have been mated.



CHAPTER FOURTEEN

A TRIBUTE TO THE PIG

SHEEP are the most distant of the animals of the farm, living in their own communities, keeping to themselves, often remote from the homes of men and in the care of a whole-time expert, who from the solitary nature of his calling tends to withdraw into himself and away from his fellows until he begins to think sheep and live sheep. By contrast, the pig is the animal closest to man, lodged often within a few yards of the farmhouse, and frequently fed direct by the housewife with waste from her kitchen. Even when the farmer keeps pigs for profit instead of to fatten for his own bacon, the pens or houses seem automatically to become a place of rendezvous where the farmer and his friends forgather to smoke their pipes and argue over the weights of the inmates. But then the pig is a peculiar person, unlike any of the other farm animals—except the farmer himself. That is not meant as disparagement of the farmer, but merely a way of saying that the pig is the most human of the domestic animals. What I mean is excellently described by an old saying which I have quoted more than once, that “a dog looks up to you, a cat looks down on you, but a pig looks upon you as another human being.” If you ever happen to have anything to do with pigs you will soon learn how true this is—how they cannot resist poking their noses, literally and metaphorically, into anything that is going on, yet with what unconcern they carry themselves.

The poor pig has been reviled down the ages as the embodiment of gluttony and sloth. Of course it is greedy, very greedy. It is this natural greed which enables it, if properly fed, in a very short time to make flesh and fat for pork, bacon and lard. But it is Man who has played on this trait, who has carried out

selective breeding to develop it and who keeps his pigs in conditions which encourage them to eat to make weight and denies them normal exercise to work it off. That is one reason why you seldom see pigs roaming about the fields or wastelands in search of their own food. To permit them to do so would be to increase the time it takes for them to reach the stage when they will give an efficient return in meat and fat for the food they have been given. But when we come to the charge that the pig is a filthy eater we are only saying that it is nearest to Man in the catholicity of its appetite. The pig, like Man, can and will eat a greater variety of things than any other animal. In its natural state, it will graze on grass, root for grubs, seeds, nuts or, indeed, anything else that it finds, including lumps of coal or cinders, or even carrion like dead birds or beasts. As a farm animal, it is given different mixtures of meal and water, say, barley meal and water, with some protein such as fish meal, or skim milk, and



maybe some boiled chat potatoes mashed in with it. It should also have some green food, such as cabbage or kale, and, if kept by the farmer to kill for bacon, will certainly get a hotch-potch of swill from the kitchen in which you may find almost anything from rotten apples to bacon rind swimming in a bucket of greasy washing-up water. In short, it is as difficult in a few words to give you an idea of what a pig will eat as it would be to describe to a visitor from Mars the scope and variety of the human diet; and that, very shortly, is because the digestive apparatus of the pig resembles the human system more than does that of any other animal. The main item in the diet of all the other farm animals is a large volume of roughage, hay, oats or barley straw. The pig's stomach cannot deal with such bulky food. It requires food of high value in relation to its volume. Like the human being, it is in a sense almost omnivorous, in that it will readily eat almost anything; like us, again, its digestion may easily be upset, and, because it is a confined animal, it can only obtain the foods brought to it by Man, instead of foraging for itself, and adding to its diet of

concentrates those minerals and vitamins which are necessary to leaven the lump

There is still a tendency among laymen to assume that the pig will thrive on a diet of swill and in the muck of any small, ill-lighted and draughty sty. This is ill-founded and if pigs may do well in such conditions it is in spite of, and not because of them. First, the pig should be fed carefully with cereal grains, particularly barley meal or maize meal, and these should be balanced with substances containing calcium, like fish meal or skim milk. It must also have fresh green vegetables and for some reason appears to need coal which it will eat with obvious relish. Perhaps, like the dyspeptic human and his charcoal biscuit, coal acts on the pig as an anti-acid! Next, because of its hairlessness—in which respect it comes again closest to the human—it is most sensitive to colds and draughts. Not only will it not make flesh and fat unless it is kept warm, but may easily develop rheumatism or pneumonia. At the other end of the spectrum, pigs are as sensitive to sunburn as any Victorian grande dame. If they are allowed to run free out of doors they must be given shade into which to retire in the heat of the day. It is this instinctive dislike of sunburn that impels them to make mud wallows in which to roll and plaster themselves with mud—not from any love of mud as mud, but to protect their almost humanly-hairless bodies against the sun's rays. Indeed, the illustrator of this book suggested another aspect of this near-human character of the pig. Speaking of the necessity for the artist to draw from the nude, he added that if an artist was not able to find or afford a human model, then let him use white pigs, in which the absence of fur or coat would reveal the ripple of muscles and sinews as in the human body. I have said nothing about its intelligence, which is of a high order, but is not generally appreciated because it is so seldom encouraged to develop it. Brief life is here its portion, a mere six months between birth and butcher if it is bred for pork, or eight months if for bacon. During this brief life its routine is feed, sleep, feed, sleep. The more it sleeps the quicker it will grow fat. Yet even in this task success will turn, according to another old saying, "less on the food in the pail than on who carries the pail." The pig is particular about who feeds it and appreciates human company. If it were to be treated more as a companion its brain would soon show up well against that of any other animal. It is on record that an eccentric Yorkshireman many years ago trained a pig as a pointer.

On the other hand, the pig, from the moment it is born, is able to look after itself. Consider the helplessness of puppies or kittens, which are born blind and are wholly dependent on their mother for the first three weeks of their existence. Even rabbits are as helpless, and though calves, foals and lambs are able to get on their feet a few minutes after being born, they are shaky on their legs and very much tied to mother for a few days. Quite different is the young pig. I remember once watching a large black sow as she was farrowing. She would give a grunt and out would pop a tiny, black parcel which shone like a well-polished boot. It would lie on its side for a few seconds only—between 15 to 30 seconds by my watch—then rise to its feet and trot round and begin at once to suck from its mother. In an hour or so they had assumed that impudent, impish inquisitiveness that characterises all little pigs, and were independent and adventurous, relying on their mother for their feed only.

Much has been written of the sensitive proboscis of the elephant, but who has yet done justice to the pig's snout, a tool as strong as it is sensitive. Regard it carefully. Pink it is, usually, and inquisitively wrinkled. With it its owner can unearth, inspect and diagnose its food; even, in parts of Italy and France, employ it in the service of Man to locate and dig up truffles from the earth. Yet for all its sensitiveness it is strong enough to root up the hardest soil or even break up pieces of stone or cement. If there is any crack or fissure into which a pig can poke its snout, then sooner or later that snout will find a way to upheave the mass. That, of course, explains why pigs are ringed, to deter them from employing these nasal bulldozers too destructively. But even ringing is not always a complete deterrent.

Lastly, what young animal possesses the impish, guttersnipe sense of humour of the little pig? Colts are things of beauty, calves roll large appealing eyes and lambs frisk and gambol with an almost idiot inconsequence, but the little pig is a born clown, for proof of which you need only watch him and his brothers and sisters for a few minutes. What a variety of stealthy approaches, sudden squeaks and grunted explosions, and violent galloping retreats you will note. I have a vivid recollection of what I mean. Some years ago a friend and I happened to look over the gate of a farmyard. There was an explosion as if we had touched off a bomb—and about sixty young pigs, alarmed at the sight of two human faces over the gate, fled grunting and squealing in all directions. We drew down our heads, waited a minute and through the latch-hole watched the fugitives emerging from under the straw and from holes and corners. We waited until the company had summoned enough courage to advance almost up to the gate. We could see them standing, snouts in air, nostrils sniffing suspiciously and forefeet braced ready for instant retreat. Then we bobbed up again. At once the same thing happened. An explosion of grunts and the sixty about-turned and dashed off, anywhere, everywhere, some of them diving head first into the deep straw. Just to see what would happen, we repeated this procedure about six times, but the pigs did not seem to weary of it. They were playing a game as much as we were, and obviously enjoying it thoroughly. I do not, for a moment, believe that after our first appearance they were in the least afraid, but they played convincingly that they were.

As a generalisation, although every farmer will keep a pig or two, the breeding and fattening of pigs for profit is increasingly becoming a specialist job, a commercial rather than a farming enterprise, often conducted in connection with some bacon-killing and curing factory. There are some thirteen different and



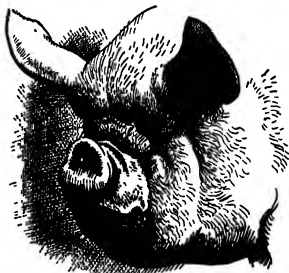
A RINGED SNOUT—LARGE WHITE

more or less distinct breeds of pig in Britain, probably more than are justified in the circumstances. Unlike our cattle and sheep, many breeds of which are of great antiquity and most of which have been standardised for a century or more, our pig breeds have only been set on a uniform basis within the last 70 to 80 years and are still not so firmly fixed as breeds of the other two animals. Like cattle they can be grouped into three categories—pork breeds, bacon breeds and dual-purpose breeds, as follows.

<i>Pork</i>	<i>Bacon</i>	<i>Dual-Purpose</i>
Middle White	Cumberland	Large Black
Berkshire	Large White	Gloucester Old Spots
	Tamworth	Long White Lop-Eared
	The Welsh	Lincoln Curly Coat
		Large White Ulster
		Wessex Saddleback
		Essex

Of these the only ones of real importance in British farming generally are the Large White, the Essex and Wessex, the Large Black and the blue and white cross between the two large breeds which is much favoured by pig-breeders because of its power of rapid growth. The Large White is a very big animal and may be seen all over the country, though more common in the north than south. It owes its development to the efforts of factory hands or miners in the cities of Yorkshire, especially Leeds, during the early days of the nineteenth century, and you may easily recognise it by its size and the forward cock of its ears. Its merits have been recognised by buyers of English pedigree stock from bacon-producing countries such as Ireland, Canada, Sweden and Denmark.

The Middle White is probably a derivation from the Large White, from which it differs chiefly in its size—it is the smallest of British pigs—and in its nose, which turns up in a very marked manner. It is also different in general shape, being a chubby, rounded pig which you might say to yourself would make good joints of fat pork rather than long rashers of bacon. The Large Black to me always looks a vulgarian, a coarse, ungainly animal, but it is almost as large as the Large White and very prolific. It has a rather interesting origin, in that it represents the fusion of two different species of black pigs which flourished respectively in the



MIDDLE WHITE SOW



LARGE BLACK SOW AND LITTER

extreme east and south-west of England, the one in Suffolk and Essex and the other in Devon and Cornwall. It is a lop-eared breed, the ears falling like giant leaves over the animal's eyes so that many a mature Large Black is to all intents and purposes blind. When crossed with either the Large or Middle-White, the Large Black gives a pig which is generally largely white but whose skin is blotched with splotches of that blue colour which seems the livery of all crosses between black and white animals. In some districts there will be concentrations of Berkshires or one of the two Saddlebacks, Wessex or Essex, though these breeds are neither as numerous or as well-distributed as the others. The Berkshire is a smallish pork pig, black or rusty black in colour, with a short head, a genial countenance and ears that are carried erect and pointing slightly forward. To my mind, it always looks to be one of the aristocrats of the pig world, and though you may come across it all over England, it will be commoner in the south than the north. Overseas it has won popularity in the U.S.A., Canada, Argentina and Australia.

There is practically no difference between the Saddlebacks, though until recently there was a keen rivalry between the champions of the respective breeds. Both are as distinctive as the Belted Galloway, with their shining black coats girdled at the shoulder with a band of white. The Essex pigs are supposed to have white hind feet and a white tip to their tail, while the Wessex hind feet and tail are all black! Small points upon which to insist indeed!

Of the rest, the Tamworth, the Lincoln Curly Coat, the Gloucester Old Spots and the rest are very localised, though easily identifiable when seen. The Tamworth, with its tawny colour and its lean, rangy snout, is surely the lineal descendant of the native swine, which in charge of a swineherd used to pasture in the beech woods of medieval England. Its snout is so long and thin that the Tamworth is said to be able "to pick a pea out of a pint pot." To-day its area is restricted to the Midlands, particularly around Birmingham. The Lincoln Curly Coat is the largest of our pigs, and as its name implies, carries a peculiarly



woolly coat. It is a heavier, more squarely built animal than the Large White, but is unlikely to be met with outside the area of its own county. The Gloucester Old Spots is a recent and local resurrection. It is interesting on account of its plum-duff appearance, like one of those old black and white forts which guarded the entrance to Portsmouth Harbour, but of no particular agricultural significance. The others—the Long White of Devon and Cornwall, the Large White Ulster, the Cumberland and Welsh—are all large, all white and all localised.

In the early 1920s it became the fashion to allow pigs to run loose and unringed and forage for themselves as they had done in the Middle Ages, when the village pigs had pasturage rights in common. It became quite a common sight to pass notice-boards bearing the legend “. . . herd of Large Blacks,” “Pedigree Herd of Wessex Pigs,” and so on. But this departure from old practice did not last long. It was found that not only did the pigs take much more food to make the same amount of weight, but that their rooting converted the pasture or wasteland into a passable imitation of a shell-pitted battlefield of the first World War,

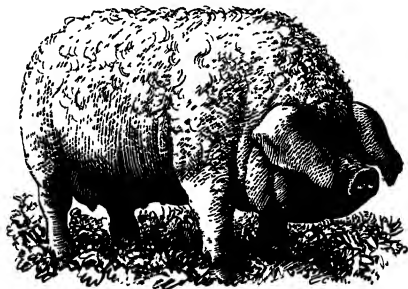


BERKSHIRE SOW

which then flourished as a nursery bed for all the rank weeds in the neighbourhood. The pigs first fouled the land, killing the good grasses and encouraging coarse plants more effectively even than rabbits, their manure was wasted, and they picked up parasites which had bred in the conditions they had created. If pigs are allowed to run free, their pasturage should be changed frequently to avoid the danger of parasitic worms, such as tape-worms, which incidentally may be passed on to human beings in bacon or pork which is insufficiently cured or cooked. So nowadays you will seldom see pigs running free in the fields, though I know a wide pasture near my home where upwards of a hundred Saddlebacks root and wallow to their obvious content. It is, however, a pasture bisected by a broad stream which would be very difficult to crop for hay and is probably too marshy for cattle. The water enables the pigs to make all the mud wallows they wish. On the other side of the road, each to her own wooden hut, the mothers of the herd are securely tied with a leathern harness and chain. Around them, in and out of the huts, and occasionally venturing down, greatly daring, to stick their pink snouts through the roadside hedges and blow at

passers-by, are the babies, dozens of them, all as clean and black and white as the magpies that flirt their tails and watch them from the high branches of the overgrown hawthorn bushes. You are likely to see pigs harnessed and tethered to movable huts in orchards and elsewhere. They will almost always be sows and I imagine you will find on close inspection that their snouts are well and truly ringed.

The pork butcher and the bacon curer know to a nicety the weight, shape and detailed physical conformation of pig required for their respective purposes. They have abundant evidence of the public taste as to the size and degree of fattiness in a joint of fresh pork or a flitch of bacon, and wish to buy animals of a shape to give these cuts. There can scarcely be room for so many breeds of pig, most of which differ widely from either or both of the two standards required. Also because the pig is almost wholly an indoor animal, the plea of breeds to



LINCOLN CURLY-COATED SOW

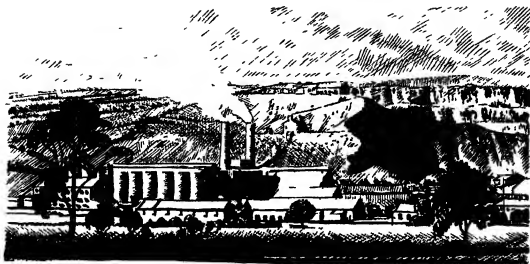
suit differing climatic conditions, which is valid in respect of cattle and sheep, cannot reasonably be advanced. A Herdwick sheep may be the only sort which could sustain itself on the rocky slopes of the Cumberland fells, and Jersey cattle thrive only in temperatures similar to those in their island home, but a Large Black, a Tamworth, or a Wessex Saddleback will grow as well in Wick as Weymouth, so long as they are properly fed and housed. It must in honesty be confessed there is little practical justification in keeping so many separate breeds of pig. Concentration on the two or three breeds which conform most closely to the pork and bacon standard would be a more profitable way of pig-breeding.

If pigs are kept on a large scale on farms the farmer must, as I have indicated, specialise in pigs, and build his farming scheme partly or wholly round them. A small percentage of farmers only will choose this form of specialisation, perhaps largely on account of the astonishing fluctuations in the price of pigs.

There is a saying—do you notice the number of sayings there are about pigs, by the way?—that pigs are “either gold or lead, but never silver.” In my district within the years, weaners—that is young pigs straight off the sow at eight weeks old—have been making as little as five shillings and as much as ninety. This may have been abnormal, but it indicates the degree of fluctuation and suggests the speculative character of pig-farming, which must be on a large scale to be profitable over a long period.

Pig-breeders adopt different methods of housing and rearing their herds. They may either favour crude and semi-temporary shelters of wood or even straw set up in the fields, or luxury apartments, built of stone and concrete and with heat for cooking and steam for warming and sterilising all laid on. If the floor is of concrete, then a wooden platform is provided for the pigs to sleep on, and a special dunging trench for use as a lavatory. It is a commentary on the intelligence and the cleanly instinct of the pig that they very quickly come to recognise and use this. The pigs which are fattening to be killed will be kept shut in their quarters, but sows or young pigs will be allowed out to exercise.

Pigs have their own names like all the other animals. Weaners from the mother grow into gilts if they are female, or boars if they are male. Gelded males are known as hogs, but hog is also a generic term for fattening pigs, irrespective of sex. A gilt that has bred a litter becomes a sow. Whereas we talk of cows calving, ewes lambing, a sow or gilt farrows. Particularly interesting is the number of names for the smallest piglet of a litter. In every litter there is one far smaller and less robust than the rest. He gets jostled off his food and generally bully-ragged by his brothers and sisters. In Yorkshire this little one is known as a reckling or a runt, in Suffolk as a pitner, in Berkshire as a dillun.



CHAPTER FIFTEEN

THE MODERN FARMER

WHAT, then, you are seeing on both sides of your road are the plant and workshops of a great industry, relying on scientific research and up-to-date methods as much as any of the manufacturing industries of the country. The fundamental difference between agriculture and the rest of our industries is that unlike them its raw material is the soil itself and the constituents thereof. I labour this point because one of the chief obstacles to the understanding of farming is the sentimental, corner-of-rustic-England mentality that persists in seeing the farming scene in terms of beauty or age-encrusted tradition.

In the second half of the eighteenth century great changes began to take place in Britain. The population, which for a century or more had fluctuated between 5½ and 7 millions, started to rise steeply. In the eighty years between 1760 and 1840 it more than doubled itself, growing from 7 to 17 millions, an increase which coincided with, and was largely a result of, that vast development of mechanical production known as the Industrial Revolution. This swelled the populations of our towns and cities with men, women and children to work the new machines, so that there were not only twice as many mouths to feed, but more people in the industrial cities who had previously been helping to produce food on the farms. The immediate effect was to give a stimulus to farming, and there ensued a short period of great agricultural activity, expansion and development. New farm lands were brought in by the reclamation of moorland, the clearing of woods and the drainage of marsh and swamp. There was a refurbishing and intensification of farming methods in order to obtain larger



crops, and a succession of new agricultural developments, all of them British. In 1785 the threshing machine was introduced, in 1840 the drain tile, in 1853 the steam plough, and between 1834 and 1843 Lawes produced superphosphate—thus initiating the practice of using mineral fertilizers on the farm. It was Lawes also who, with Gilbert, founded in 1843 the agricultural research station at Rothamsted, the oldest and most famous centre of its kind in the world.

For a space of years British farming grew more and more efficient, though the towns swelled and the mills poured soot over the countryside. Then, about the year 1869, quantities of grain began to arrive in Britain from the newly-developed grainlands of Canada and U S A , and subsequently meat from the ranches and stations of Argentina and Australia. This torrent of food led people to believe that they could get their daily bread from overseas more cheaply than from their own acres. The belief was translated into Governmental policy, and thenceforward the industries of the towns and their swollen populations were subsidised by food imported from overseas—at the expense of the farmlands which had served the country through the centuries. The effect was to concentrate attention on the new British manufacturing industries and to neglect the farming industry, a neglect which was intensified by the growth of railway travel about the year 1840. For almost a century the roads of Britain were deserted. The tide of development and progress passed the country by, and life in hamlet, village and market town stood still. Towns which had once been busy coaching centres fell asleep and village life went on much as it had done since Elizabethan days. From 1870 until 1914, neither the people of Britain nor their governments in London bothered about farming. It was a nuisance, the poor relation in the industrial economy. When it demanded some action, the attention accorded to it by authority was the kind that is given to some ancient monument. The idea took root that farming was not worthy of the scientific treatment extended to other industries, so that it is, perhaps, not surprising that farming methods and practices should, by and large, have tended to remain roughly where they had been in the early days of the industrial revolution. Yet this outward and visible lethargy and backwardness were deceptive. During all these years of neglect, farming never gave up trying and, above all, never abandoned its great tradition as the custodian of Britain's fundamental asset—the fertility of her soil. This was proved when, in the first German war, the efforts of British farmers beat the enemy submarine blockade and saved the country from starvation, but, as soon as the war was won, the thanks of a grateful nation were expressed in renewed neglect of agriculture in the scramble to buy cheap food. Between the two wars the countryside was certainly rediscovered by the people, but they saw it in terms of relaxation, pouring out of the cities at week-ends in coaches, cars and charabancs, on push-bikes and on foot in search of sunshine and fresh air. The influence of this torrent of city-dwellers was to increase the tendency of the countryside to wear an "olde worlde" look, to affect the mock antique and to cater for the desires of the week-end tripper in the form of "farmhouse teas" instead of the needs of the nation in essential foodstuffs. I, even I, can remember the change-over as it concerned the compact little market town of Boroughbridge on the Great North Road in the Vale of

York. When first I knew it, and the year was no longer ago than 1908, it was a quiet backwater of warm, red brick. To reach it, one took train on a branch line joining Harrogate with the main line at Pilmoor, near York. As many as six trains a day passed in either direction, and I recall that at Starbeck there was a ticket-collector with the longest, waxed moustache I have ever seen. The old coaching inn was empty except at the annual Barnaby horse-fair or when the local farmers' dinners were held there. So Boroughbridge remained, comfortable, quiet and discreet in isolation, until 1919. I revisited it again in that year and in the few years following, and what a change was there! The North Road had been rediscovered, and was now a roaring cataract of motor cars, coaches and lorries. The railway was deserted, and only one train ran each way on the Brafferton and Pilmoor branch. The old houses shook and rattled by night as by day. Stranger still, all those which in my boyhood had been the homes of prosperous Yorkshire families, had become motor-posting hotels for the new road-users on their way to discover the British countryside as a holiday resort. It was not only a transformation but a degeneration. From a competent community based on the rich farmlands around it, the town had become a one-night staging camp for the motor tourist.

Once again war came, and once again the farms of Britain came to the rescue of Britain besieged. Once again the food was produced, though many well-established precepts of fertility had to go by the board in the process. Farming came into its own and thus time when victory came there was no turning away. There was little food to be had from abroad, the shortage was world-wide and Britain no longer possessed the money to buy all she needed. The country had to rely in peace-time on its own farming resources more than it had done since 1820. From being merely one of Britain's largest industries, farming became most important of them all. Farming alone could earn valuable profits by selling pedigree stock all over the world—to Russian state farms as much as to American capitalist ones. Farming finally is the only industry which does not exploit the British countryside, but enriches it. Those who lament the tidying-up, the modernisation of the rustic scene with all that it implies in the rooting-up of hedges, the cutting of hedgerow trees and the replacement of horse and man by the machine, should not only realise that such developments are necessary to increase the efficiency of the farming industry as a producer of food, but should compare them with the effect on the countryside when any of the manufacturing industries expands beyond the brick and mortar confines of the cities.

The destruction of the country by Industry is not a sad reminder of the wasteful days of the Industrial Revolution. Industry to-day may be more careful of human life and health, but it must still, from its very nature, destroy the countryside. Within recent years, for example, coal has made heavy inroads into farming Britain. Along the Kent coast, in the garden of England, the spoil banks and winding gear of pits round Dover and Deal advance ever farther into the fields. In many districts the urge to get coal by the easiest methods has led to the destruction of miles of valuable farmland as well as the permanent disfiguration of such historic places as Wentworth Woodhouse. The search for limestone, needed alike by manufacturers and farmers, has literally torn the

heart out of the high grass hills of Derbyshire. Where once were upland pastures for breeds of sheep like the local Gritstone, great, grey-brown gashes mar the hill's face, the hundred-foot cliffs of man-blasted quarries. The lime may be necessary, but the land is no more. The rolling grassland and tall timber of the Midlands around Corby in Northamptonshire, excellent grazing country for cattle and horses, have been torn and tortured and ruined by the digging for ironstone. All over England, but particularly in the rich market-garden soils of the Thames Valley, thousands of acres have been lost to farming by the search for gravel, a peculiarly wasteful process, since the pits, once dug, immediately fill with water and so are useless except as haunts of waterfowl or resorts for the week-end angler. Round the western fringe of the rich Fenlands stands, as we have noted, the stockade of tall chimneys which mark the brickworks whose raw material is the blue clay buried beneath the thick, black top soil. All these searches for minerals may be justified by the national needs for coal, lime, iron, gravel and clay, but the significant fact about them is that once they have begun the land is almost always ruined utterly and for ever as farmland.

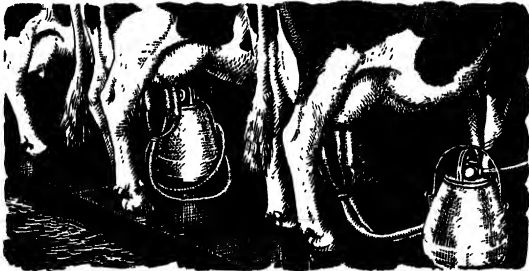
By contrast, the farmer has the liveliest consciousness that, by keeping his land in good heart, his interest will be best served and the tradition of his craft upheld. There is in Britain no danger of "dust-bowls," of soil changed by over-exploitation into dust so that it blows away like chaff before the wind. During the war years, under the rod of necessity, the arable lands of Britain were made to carry one straw crop (wheat, oats, barley or rye) after another, some for several years in succession. This had to be done, moreover, when the slaughter of livestock, for which no food was available, seriously reduced the amount of humus, or "muck," so that there had to be greater reliance on mineral fertilisers than might in normal circumstances have been considered wise. It was in many quarters feared, and in not a few prophesied, that such defiance of the traditional rules of rotational cropping and fertilisation would call down the wrath of heaven and result in a general loss of heart in the soil. The fears have turned out to be groundless and the prophecies false. This also suggests that the land *can* remain fertile without rotational cropping. In any event, thanks to the stored fertility in Britain's soil and the care with which the farmers went about their task, the heavy cropping programme imposed by war-time emergency has not left our farmlands in poor heart. On the contrary, they are to-day in better heart than they ever were. This is the considered judgment of the experts who speak with authority.

Here is proof that no matter under what compulsion the farmer works, agriculture is the only one of our national industries which enriches the countryside, which the others ravage and destroy. It is time that every thinking member of the community gave attention to this little-ventilated equation—the increasing need for Britain to feed herself and the increasing shrinkage of the acres available for food production. We are not so large a country that we can afford to be prodigal of our acres, permitting them without question to be encased in concrete for aerodrome runways, allowed to revert to the wilderness to oblige the War Office, or taken for housing estates, as well as despoiled for the minerals beneath them.

Since Agriculture has come into its own again it has received the same sort of attention from scientists and engineers that the other industries have long enjoyed, and during the past ten years there have been giant strides made both in the spread of mechanisation and in agricultural research.

One tractor-drawn plough with four shares does not merely do four times the work of the old one-share horse-plough, but, owing to its greater speed over the ground and its quicker turn-round, is able to do something like nine times as much. Other operations of a similar nature—cultivating, harrowing, rolling and sowing—have been similarly speeded up, while Brobdignagian tools like the gyro-tiller and the bulldozer enable wastelands and even woodland to be cleared and prepared for cultivation literally in a few hours. New machines are constantly being added to the number from which the farmer can already choose, besides the improvements in design and performance being made almost daily in existing types. Dairying is almost wholly mechanised, and you may visit large milking herds where only two men or land-girls are needed for all the milking and after-care of the milk. At milking-time the disinfection of the udders and putting the machine on and off are the only jobs done by hand. The milk is then separated by machine and chilled by passing over a cooling machine.

If mechanisation has been long a' coming to the farm, its progress in farming has been quicker than elsewhere. A point of interest is that, as a generalisation, its effect has been rather to reduce the number of men required for each task and to make easier the daily work of those employed, than to speed-up farm processes. The major processes on a farm depend upon the revolution of the natural cycle which the machine is powerless to hasten. A hundred or more years ago, for example, harvest workers were hired especially for the harvest. They were paid a fixed sum, but had the option of accepting this either for the month or "see it in." This meant that they could take a gamble on the weather. If it looked likely to be wet, it would pay them better to work on time and



A MILKING MACHINE

accept a month's work. If they thought the harvest would be fine they would naturally choose to "see it in," because this might be done in a matter of a fortnight or three weeks. To-day, with all the mechanised help the farmer has at his disposal, the harvest still takes much the same time to get in, though one skilled mechanic is probably now necessary where several highly-skilled agricultural craftsmen were needed before. The exception is the combine-harvester. Here, obviously, with all the operations of cutting, lifting, threshing and bagging done by one machine, the harvest processes have been enormously speeded up. It is still early days to predict the extent to which the combine-harvester will supersede the older methods of harvesting, or how quickly the change is likely to take place, but it is already clear that in its effects it is the most revolutionary single piece of machinery yet to be made available to the farmer, and probably the most valuable in a climate so fickle as ours.

As with machinery, so with the application to farming of the fruits of scientific research. Necessity is still the mother of invention, and Britain's need for more home-produced food has stimulated chemists and biologists to assist in the task. Within the past ten years one new development has followed hot on the heels of another. We have noted many of them. In the realm of soil science, there have been developments in mineral fertilisers and the methods of using and applying them, there has been general recognition by farmers of the wisdom of insuring against grain diseases by dusting the seed with some mercurial preparation, and of preventing potato blight by new sprays based on copper. Major pests, such as the voracious wire-worm, are already threatened by the discovery of new and powerful insecticides, and the farmer's age-long war against weeds has been half-won by the revolutionary selective weed-killers which cause the weeds to commit suicide, without harming the growing grain. In the realm of animal husbandry, Science has passed to the veterinary surgeon a wide range of drugs, anti-toxins and serums, some of which were originally developed for use on human beings, and others the result of specific research into animal diseases. All sorts of animal complaints, such as contagious abortion in cattle or swine fever among pigs, which once caused serious losses, have now been brought under control. Indeed, of the ills to which our British stock is heir, only "foot and mouth" disease, which attacks cloven-hoofed animals, and the deadly fowl pest among poultry, still stand without either a prophylactic or a cure.

There have been notable developments in the types of various crops, especially wheat and potatoes, but also of new grasses and clovers, designed to give more food per acre. Be it repeated here that the urgency at the moment is to make full use of Britain's unexcelled grassland. It is our grassland that can be made to yield the greatest amount of additional food, and new grasses and clovers have been evolved as the most efficient raw materials for the new processes, such as grass drying and silage, which aim to make greater use of grasses and grassland. Both these processes, by the way, though still novelties, have already become accepted practices in British farming.

Now, if farmers were the straw-sucking clodhoppers they are so often imagined and even depicted as being, there would be little hope of them wel-



A FARMER ON HIS ROUNDS—A ROTARY CULTIVATOR

coming or adopting a tith of the new implements, processes, prophylactics and plants which the engineer and the scientist have made and are making available to them. The sober fact is that to-day few sections of the community are as alert to new ideas, or less prejudiced against adopting them. While farming remained the Sleeping Beauty, it may be that farmers were content to let the tide of progress pass them by, but to-day all that has changed. There are, of course, some diehards who will not move with the times and some dead-heads who cannot do so. There are also some poppy-heads who, believe it or not, would like to move backwards into a cloud-cuckoo land of their own imagining. Of this minority, more later. With these unimportant exceptions, the farmers of Britain have of recent years shown an unexampled readiness to examine and give a fair trial to each new development or invention, and not the farmers only but their sons and daughters, their work-people and their work-people's children.

The avidity for knowledge among farmers and farm-workers is little short of amazing. Nothing like it exists in any other industry. It began during the critical days of the war when Agriculture realised it was fighting in the front line of national defence, and determined to be worthy of its responsibility. The farming community has found time not only to increase its efforts and its output, but to put itself to school and even to night-school. In country districts, farmers hurry, after the day's work is done, to lectures, technical film shows, discussions or farm quizzes. They foregather in one another's kitchens for fireside discussion groups on winter evenings. They congregate at week-ends to watch demonstrations of new processes or of new machinery and appliances. A measure of this thirst for knowledge was to be found in the recent visit to Britain of a well-

known U.S. authority on dairying, Professor Petersen, who brought with him a film showing the technique of machine-milking and the structure of the cow's milk-producing organs. During a tour of six weeks, he gave nearly forty lectures to a total audience of 50,000 farmers. Almost everywhere the press of people to hear him was too great for the hall space available, so that at Taunton he was only able to deal with the situation by giving three talks in succession, and at Chippenham by talking to the crowd in one room while the film was shown in another, and then changing over. At Southampton, as a result of one advertisement in the local papers, 6,000 applications for tickets were received for a hall seating no more than 3,200. It is difficult to imagine, say, foundrymen, or mine-workers or electrical engineers, travelling long distances and queuing to hear a technical lecture on their own subject, yet it is characteristic of the modern farmer. Nor is the movement confined to the farmers and their adult workers. The boys and girls are every bit as keen, as witness the Young Farmers' Club movement, open to children of both sexes, which began modestly in 1921 and to-day embraces 1300 clubs with a total of 65,000 members.

The feature common to all these activities is the eagerness of the countryman to learn about everything that is being written or is happening anywhere in the world which could profitably be applied to British agriculture. In order to meet the unparalleled demand for knowledge and practical help, the Government have erected a permanent national educational and advisory system on the foundations of the country agricultural organisation created to meet the emergency of war. Up and down the country from the village of East Malling in Kent to Aberdeen on the north-east coast of Scotland, there are more than a dozen agricultural research stations, seeking new applications of science to the age-old business of farming, breeding new and better plants and animals, examining methods of controlling plant and animal disease, finding better ways to feed pigs and cows. Scattered about from Wye in Kent to Aberdeen are more than thirty university departments, colleges and farm institutes, training and educating men and women for farming, for research, for teaching and for the advisory services.

The sixteen centres from which these advisory services radiate are dotted about the country. At them farmers can have their soils and feeding-stuffs analysed, their milk tested, their insect enemies identified, and the diseases of their crops and their animals diagnosed. Here, too, they will find specialist advisers on pastures and crops, on fruit and vegetables, on poultry, cattle and farm machines. And in every district there will be a District Advisory Officer with his committee of leading farmers, helping all who are in difficulty, organising demonstrations, and giving talks on new developments to the many hundreds of farmers' discussion clubs. All told, there are in Britain to-day some four or five thousand people devoting their whole lives to the business of helping farmers to farm better and better.

You need only keep your eyes open as you travel through the country to realise that the traditional Farmer Hodge is as rare as a hansom cab in Piccadilly. The B.B.C. as well as music-hall comedians persist in portraying the farmer as all brawn and no brain, a rubicund, side-whiskered gaffer whose conversation

is largely a repetition of "Ar that he do," or "Ar, that I hev," which is as far from the truth as the clipped refinement of the B.B.C. announcer is unlike current English speech. I have a successful farmer in my mind's eye as I write. He is slight of build, dressed as any townsman, his face clean-shaven and pallid, and his expression mournful. His direct look and the tight set of his mouth reveal the purposefulness of his character, for he is as hard a bargainer and as long-sighted a business man as any the cities can produce. Far from striding in leather leggings across his broad acres, he is seldom out of his car. Responsible as he is for six farms of a total of 3,000 acres and widely separated in distance, his day is fully occupied from sun-up to sun-down in visiting them and receiving reports from his foremen, giving them their instructions and in calling on suppliers and attending markets to buy the seed, implements and stock they need, and to arrange for the sale of the produce they have or will shortly have ready for disposal. At times he will charter an aeroplane and fly from East Anglia to the West Country, say, to buy cattle. This enables him to accomplish in a day what would otherwise take the best part of a week, and, like any other business man, his time is money—and the result is food. His interests are as various as they are important. He grows arable crops, including sugar-beet, of course, with market-garden vegetables as a side-line. He is a sheep-master with flocks of black-faced Suffolks. He has at least one large dairy herd of Ayrshires—not yet polled, though I have an idea they soon will be. He is also an accredited grower of pedigree seeds, both grain and grasses, under contract to the big seeds merchants. Lastly, he maintains his own workshop and technicians for the repair of his tractors and machines of all kinds. Admittedly he may be an exception in the size and variety of his interests, but to my mind he is an exception that proves the rule that farmers to-day are different from any other producer only in the fundamental nature of their business. They are directly concerned with the land and the fruits thereof, by which we all must live.





THE FARMSTEAD

UNDERSTANDABLY perhaps, all this rationalisation of the countryside, bringing it alongside the rest of national life, is deplored by many people. In one sense I am among them. I hate to see the hedges levelled to the ground, the thorn thickets hacked back and burnt down, the hedgerow trees felled. There is no denying that the high hedge, which in spring is a piled snowdrift with May blossom and in July blushes with the pink garlands the dog-rose throws over it, is more pleasing to the eye than the same hedge when hewn down to a line of blackened stumps sticking stiffly up from the coarse grass. I know that, justified though the farmer may be in cutting it down, he is removing not only the cover which protects a multitude of small birds in summer but represents their larder in winter. Near my home, as I have noted earlier, the hedge-removing urge has reached drastic proportions. Nevertheless, one tall thorn hedge with its thick bottom of nettles, thistles and brambles still stands not far away, and walking along this during the bitter weather of the 1946-47 winter I saw it was alive with birds—tits foraging in family parties for any insect which might be left on the branches; chaffinches, goldfinches, bullfinches, bramblings and greenfinches after any seeds which lay in the hedge bottom; and alien field-fares and redwings competing with the native thrushes and blackbirds for the few berries that hung redly from the bare twigs. Without that hedge the mortality among the wild birds of the district would have been still greater. It was a haven of food and shelter for hundreds of them. I lament the shaving and polishing of the countryside. But also I recognise the need for it, and if I were a farmer I should, like him, do whatever I felt likely to increase the efficiency of my holding.

To the poppy-heads, whom I have mentioned earlier, all progress on the farm is anathema. They struggle to return to the Britain not only of their childhood but of their fathers' and grandfathers' childhoods, to escape backwards into a Never-Never land when "farming was farming and no manure went on the land that did not come out of an animal's behind!" They base their case on theories unrelated to the facts of the past, the needs of the present or the promise of the future. Their attitude may be epitomised as an objection to any method or practice which was not standard, say, in 1800 or thereabouts. Flapping their wings wildly before the wind of scientific evidence, they declare that scientific processes and chemical products, when applied on the farm, are against Nature, or upset the balance of Nature—forgetting that the science and practice of farming is a planned offensive against this balance. Mineral fertilisers are, they argue, a kind of cocktail which stimulates the land only to exhaust it finally; the new insecticides kill bees; mercurial seed-dressings poison fox-hounds and so on and so forth. I wonder whether when they catch influenza they insist on their doctors dosing them with natural quinine, and refuse the synthetic product?

Now, I contend that if we are logical and rational we shall recognise our own nostalgia and the beatings of the poppy-heads for what they are. They all spring, creditably enough, from the heart. We do not like to see this green and pleasant land of ours rationalised and regimented, we prefer thatch to shingles, horses to tractors and, above all, to the older ones among us, the scenes of our childhood are the most vivid and the most alluring. But if we are just we shall also recognise that our attitude is influenced by the century-old view of the country as a backwater, a pleasant playground for townspeople on holiday or at week-ends, whereas the truth is that by the natural order the country is the proper place for Man's endeavours, and the city, with its theatres, its cinemas, its restaurants, and its central heating, should be the Man-made place for him to luxuriate or make holiday. The calendar should, ideally, be eleven months' work in the country and one month, or less, of leisure in the town, and how much healthier and happier would every one be if such a balance could be struck. We have inverted Nature's order of life, and come to regard the country as something between a museum-piece and a holiday camp. That is the idea which must be discarded.

How differently we still regard matters agricultural from others you can judge for yourselves by considering a few examples. When you see an old motor car on the road, as stiff and upright as any Edwardian lady, or one of those fussy Victorian locomotives kept on the rails long after they have earned an honourable retirement, your mind registers them automatically as curious survivals. Yet the backward or financially-embarrassed farmer can use any ancient or out-of-date equipment on his fields without your noticing. That may, of course, be because you do not know, but, in that event, why do you not know? Horse-drawn vans on city streets slow up traffic sufficiently to call attention to themselves while horse-drawn buses or a hansom cab are no better than relics escaped from a museum. Yet on the land the replacement of the horse by the machine continues to be a matter for lamentation. Why should that be?

Come to think of it, electricity or diesel engines now supply the power for all the chaffing mills, water pumps, dairy apparatus and the like on the farm, which had once to be operated by horses or hand labour. Why then not acquiesce in the inevitable and accept the machine as the source of agricultural as much as of industrial power? The day of pit ponies and of galley slaves is over.

Lastly, have you ever pondered how different is our attitude of mind as to factory and farmstead? A century-old factory—and there are many such in the older industrial districts—at once proclaims its age, no matter that it may have been re-equipped internally with modern machinery. All we register as we pass it is a gaunt, blackened rectangle, punctured by hundreds of small windows so dirt-encrusted that they reflect such rays of the sun as pierce the prevailing smoke pall, instead of letting them pass to bring light and warmth to the inmates. The whole structure shouts out that it is a relic from that dark age of the early days of steam and flaring gas jets.

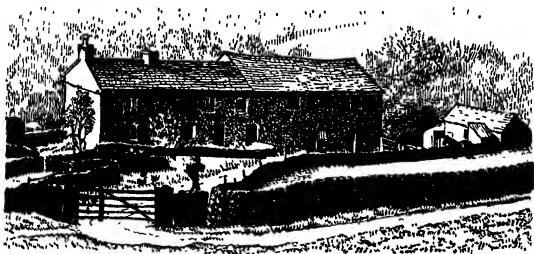
The farmstead, by contrast, seems to acquire merit with age. The majority of British farm buildings must be centenarians, and a high percentage date back as far as the fifteenth and sixteenth centuries. But the older they are the better they seem to be bedded into the surrounding landscape. They look as if they belong, which of course is true—they do—but they are, for all that, often as out of date by modern standards of efficiency and the health of both human and animal inhabitants as any early nineteenth-century industrial barracks in Rochdale, Burslem, Glasgow or Dewsbury.

As with farms, so with the cottages. The thatched cottage nestling comfortably close to ground behind its hollyhocks looks cosy and inviting, but as often as not the front door opens directly into the living-room, the building was erected before damp courses were known, so that its walls run water in winter and sweat into leprous patches in summer, while its picturesque thatch is no more than a rowdy tenement in which sparrows and rats wrangle for residence. Lovely to look at, perhaps, but without any comfort for the occupiers and frequently a contributory cause of the rheumatism and arthritis which prematurely cripple many farm-workers.

In point of fact, the farm buildings of Britain are the chief, and probably the only, blot on our agricultural record. Our farm tradition and practice is second to none, and our pedigree stock is unequalled, but the main carpet of our farmlands was laid down centuries ago, since when there have been few major changes. Indeed, for the past hundred years there have been practically no alterations in the general pattern of the countryside, except where some great estate has been broken up into a number of smaller farms. Only where this has happened would you, until a few years ago, have seen any new farmsteads. Otherwise they were as they had been when first built at any time during the past 400 years. Of course, all these permanent buildings have been added to from time to time, as the business of the holding has developed or altered in character. There will be a clutter of Dutch barns—which are no more than corrugated iron roofs on high frames under which stacks are built—silos, and other erections of a temporary or semi-permanent character.

The materials of which the farmsteads are built vary, as you will notice,

from district to district. In areas where stone is available locally they will be built and roofed with stone and look as much part of the landscape as the stone outcrops on the higher hillsides. You will meet these stone farms throughout Scotland and Wales, the North of England, in Lincolnshire and the Cotswolds and Somerset. In Wales, Cumberland, Westmorland and Scotland the buildings will be whitewashed, so that the farms, clinging to the steep hillsides, show up like torn scraps of paper against the blue distance. An unforgettable memory of mine is a motor-car drive through the North Yorkshire dales near Sedburgh at twilight. As the darkness deepened lamps were lit in the farms on the hills, and on both sides of our road the dale twinkled with points of light like the sky above and emphasised for me the loneliness of these hill-farms by showing the distance between one point of light and another, and from the main road we were travelling back to the town.



STONE WALL COUNTRY

In Lincolnshire, the Cotswolds, Somerset and the West Riding of Yorkshire the grey stone will usually be left in its natural state. The stone-slab roofs of these farmsteads, by the way, form natural rockeries, attracting not only rock plants like stone crop and the lichens which spread in orange-yellow blots across the slabs, but pink tufts of valerian, or a chance wallflower escaped from the garden.

In the Midlands there is the warmer reddish and yellowish ironstone, as well as red and blue brick. It may be a personal view only, but my feeling is that brick seldom fits into the country scene as well as stone, except the very old buildings whose bricks have weathered and mellowed through the centuries to harmonise with the changing colour schemes of the fields and woods around them, and whose roofs still carry the crinkly, pot pantiles. Many of the newer farms, which is still a comparative definition, will be found to have slate roofs brought from the quarries of North Wales, but these always seem to strike a harsh new note. Slate does not weather like brick. In the Downlands, or in



parts of East Anglia, where there is chalk below, the farmhouses will be either of clay lump and lathes or clay lump over rush straw; or of flints set in plaster. The outbuildings will usually be of tarred boards set on flint bases.

In no other part of the British Isles do the farm buildings look so old or dilapidated as in parts of the Eastern Counties. This may be due to the impermanence of the materials—the wood rots and both clay lump and flint walls suffer seriously from frost—or a delayed result of the long years of agricultural depression which afflicted these granlands particularly. In the Fenlands the farmsteads are unlovely box-like erections of a harsh yellow brick which never weathers into mellowness, and which shows up against the black soil like “a bar of soap in a coal-cellar,” as Kipling says. Down the Welsh marches, that grassy, garden strip of Western England from Chester to Hereford, there is a high proportion of the lovely black and white half-timbered houses which advertise their Elizabethan foundation or proclaim themselves as copies of the Elizabethan style of building.

It is proper and useful that you should keep your eyes open for the buildings as well as for the crops and stock of the countryside. By so doing you will come across many little gems of ancient architecture and rustic loveliness. But what I wish to suggest is that you should view these farmsteads objectively and indeed, critically, as the Headquarters of the business concern represented by the fields and meadows around them. As such they should be so built and laid out as to make the daily work of the farm as practical and easy as possible. And that, I think you will soon find, is what not one British farm in one hundred can claim to do. This is no criticism of the modern farmer, but simply that the general plan of his farmstead and the accommodation it provides for man and beast were completed in a day when labour was cheap, when little or no heed was paid to the health or welfare of the worker and prevailing ideas of efficiency and hygiene were elementary.

Look for yourself at the farmsteads you pass. Study them closely and imagine how you would like to be working on them, at all seasons and at all hours of the day, from 6 a.m., when the horseman must be on duty to groom and bait his horses before they start on their day's work, till sun-down, when the last worker is in from the fields. You will, I think, see that the buildings are scattered without rhyme or reason. There is no covered way between one and the other, so that the workers are exposed to all the vagaries of wind and weather. Think of them during the searing blast of a January gale. The storm rampages through the stockyard, tearing out great lumps of straw and hurling them in festoons across the telegraph wires, then romping as if in glee round the corner of the barn, where it catches the yard-man as he comes out, head down, with a full pail of calf-food, say, in either hand. It whips off his old cap and whirls it away into the open muck-heap, which, though it is a smoking bog in the winter air and a hive of buzzing pestilence in the heat of summer, stands most unsuitably in the middle of the yard and no more than a few yards from the farmer's dwelling-house. This is only one of the many pictures I could paint you to show that there is no method about the layout of the buildings, no protection for the workers and no regard for their convenience.

Another example. The big farm barns of the arable counties. They stand, many of them, as high as the village church, their roof area is immense and highly expensive to maintain in good order, as are also the wooden doors set on either side of the building and opposite to one another. These barns were models of practical good sense when they were built, designed for the under-cover threshing of the grain as well as its storage, at a time when all had to be done by hand labour. The horse-drawn wagons were led straight into the barn from the harvest fields, the sheaves stacked there and in due course threshed with hand-flails on the wooden threshing floors between one door and the other opposite it. Then both doors were open so that the through draft winnowed the grain by blowing away the chaff. To-day, of course, the whole building is out of date—an antique, and an expensive antique into the bargain. Nowadays, threshing is done by machine, still more often by the fine, upstanding steam-engine, but increasingly by small, and handier agricultural tractors. In either event it can no longer be performed in the barn, so, because an under-cover threshing-floor to suit modern requirements does not exist, the job must to-day be carried out in the open. In other words, the farm-worker of the present day is worse off in this respect than his predecessor, and the farmer is handicapped because out-of-door threshing can hardly be carried on in high wind, rain or snow—and one or other of these conditions obtain on a high percentage of days during the threshing season.

The same kind of story applies to almost all departments of farm work. Farming to-day is mechanised, yet few farms have adequate accommodation for their machines. Obviously, no machine is improved by exposure to damp or frost, but you will find on most farms that tractors and the smaller machines have to be parked in the rustic lean-to which was designed for wooden carts, while the larger pieces, like the elevator and threshing tackle, must remain out of doors under a tarpaulin. The farmer's private car is another matter, and you will usually discover that this has its own enclosed garage.

Taking planning a stage further, you will soon see that the location of one farm building in relation to another indicates that there has, as yet, been no motion study such as is standard in manufacturing industry. How far has the stockman to walk with his pails of food? How many times a day has he to make the journey? Could his work be made easier and more efficient by shifting the food-mixing shed to some more central position? The answers to questions such as these would, on most farms, result in cutting out half the time and energy now needed for this and other jobs about the farm. In only one farm that I know can the stockman mix his foods in a central room with water and electric light laid on and carry them to the animals in the yards as well as the buildings without needing to step out of doors. Similarly, potatoes must be stored and riddled in the open, when it would be far more efficient to provide a proper potato storehouse with enough floor-space for a riddle. The small, compact stone farmsteads of the grassland country, designed to handle one crop and house a few cows and horses, are better laid-out than the majority of arable farmsteads, in the sense that they usually conform to a close-knit plan, the dwelling-house being often joined to the outbuildings, which form three sides of a square. The

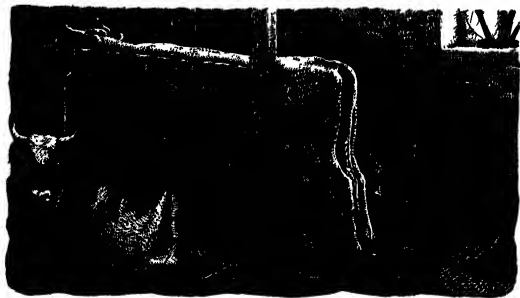
anachronism here is usually that between the three sides the builders of perhaps 200 years ago thought it meet to set the midden or muck-heap. The eighteenth-century farm-wife could thus open her kitchen door and pitch her swill on to the heap almost as easily as the stock-man could fork out the manure from cow-stall, stable or pig-sty. To-day we recognise muck as an indispensable source of organic manure, but equally as a dangerous source of insect-born illness, and are at pains to keep it away from the farmhouse.

Equally, in almost all old farm buildings the animals' quarters are dark and devoid of proper ventilation, and animals can no more thrive without light and fresh air than humans. My olfactory memory at once registers the difference between a modern cow-house, high, light, airy and disinfected daily, and the old mistals or shippons of the Yorkshire Dales. How well I can savour in memory those low-roofed, ill-lit caverns, heavy with a scent compounded of the smell of hay and the sweet breath of the beasts, but so charged with ammonia that it set eyes and nose atingle. By contrast, the modern cow-house has, as I have already noted, the clean and sterilised atmosphere of a hospital ward.

The newer type of milk farmers have installed up-to-date plant and equipment, employ the most modern and hygienic methods of dairying. Yet time and again you will discover that these white-tiled, chromium-plated affairs have been built into the farm to suit architectural convenience and without due regard to the other daily activities. I have in my mind's eye several farms where the cows as they are driven in to milk have to cross the paths of men on other jobs, and even, on one farm, the path to the front of the dwelling-house, so that these are inevitably fouled and churned up in wet weather.

I think that if we are honest we must recognise that one of the important tasks before British farmers is to give their farmsteads the same sort of care that has been for years devoted to the lay-out of factories or colliery pit-heads. The aim must be to try and assemble everything under one roof in a building or buildings with water and electricity laid on, and with the various parts so designed that all the work can go on at any time, in any weather, with the maximum economy of human effort and the least possible hurt to beast or machine. I do not mean to suggest that in present circumstances farmers can find either the funds or the materials to redesign and rebuild their farmsteads, but rather that they and every one concerned with British farming should give the matter more attention, so that over a period of years we can bring our ancient buildings up to the same high level of efficiency of our crop production and our pedigree stock. This will mean using many materials, not hitherto welcomed in the countryside, and adopting daring and revolutionary ideas for the lay-out and construction of buildings. Why not economise in material and ground space by two-storey animal quarters—a clean, light, airy cow-flat above and the more elementary stables and sties below? Dairy cows can scarcely be expected to learn to walk upstairs to be milked, so that inclined ramps would have to be made, like those used in the temples of ancient Egypt, but these would enable tractors to be run up with the cows' rations, and to load with milk directly from the dairy.

I cannot recollect one farm that is entirely new, laid out and built according



AN OLD COWSHILD

to modern requirements and with modern materials. The one that comes nearest is a large farm which sits at the foot of a steep, wooded hillside within sight of the Wrekin in leafy Shropshire. When I say that all the modern buildings—and they comprise the greater part of the farmstead—consist of cement and corrugated iron, it may leave the impression that they are a blot on such a lovely landscape. In point of fact, their rounded roofs and unobtrusive green paintwork harmonise well with their surroundings, and are not discordant even against the rest of the buildings, most of which are medieval, for this was one of the farms of Buildwas Abbey, as far back as the fourteenth century or even earlier. To-day the new buildings house a large and finely-equipped machine-shop, where all the farm's machines are repaired and kept in order, a factory-size grass-drier and an electrically-driven mill to grind the dried grass into flour or meal. The interest to me is not the extent to which the whole of the farm buildings have been modernised, but the manner in which corrugated iron and cement have been dovetailed into ancient stonework and oaken beams. It shows it is possible to use the most modern methods and materials without ruining the beauty of the countryside.

Let us end this book, as we began, by harping on the note of fertility. Soil science has already come a long way, considering the short time it has been studied—a very long way. But, as the years pass, our farms must increase their efficiency if the health of the nation is to be upheld. At the present the yields per acre of British land have been built up to an average higher than fifty years ago, and higher still than 100 years ago. But there is still a disturbingly wide gap between what is a good yield and the average reached by our farmers as a whole. You may judge this for yourself by the following table:



			<i>Average</i>	<i>Good</i>
WHEAT	..	..	18 cwts. or 4 qrs.	27-32 cwts. or 6-7 qrs.
BARLEY	..	..	16 cwts.	30 cwts.
OATS	.	..	15 cwts.	35 cwts.
PEAS	.	..	17 cwts.	25 cwts.
POTATOES	.	..	6-7 tons	16 tons or over
SUGAR-BEET	..	..	8-10 tons	15 tons or over

The first task must obviously be to bring the average level nearer to the best, to make a higher percentage of average farmers into first-class farmers, but I have also an idea that Science has still much to discover about fertility. For instance, the best-ever yield of potatoes recorded per acre was fifty tons! In the present state of our knowledge and methods, this must be regarded as a freak figure, but there seems no reason why, in the future, British farmers should not manage to get much nearer such a level without any falling away from their centuries-old tradition of leaving their land better than they found it

Recently a first-class farmer in my part of England celebrated his jubilee as a farmer. He gave it as his opinion that average crops could be brought to a higher level. The essentials were good cultivation, deep ploughing, sound draining, choice of the best seeds, control of weeds and the scientific application of farmyard manure and mineral fertilisers

These are matters which should be more widely and better understood at a time when the world is driving forward to conditions which will increase the importance of British farms as the producers of the nation's food. Let me quote the words of a great Englishman and a great countryman—Lord Halifax—when he set the seal on a lifetime of distinguished and unsparing public service by accepting the presidency of the Royal Agricultural Society of England in 1948. "It has been left to these hard and teaching times," he declared, "to bring home to people, with rather uncomfortable and menacing force, how greatly they depend upon what agriculture and those who live by it can do."

THE END

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