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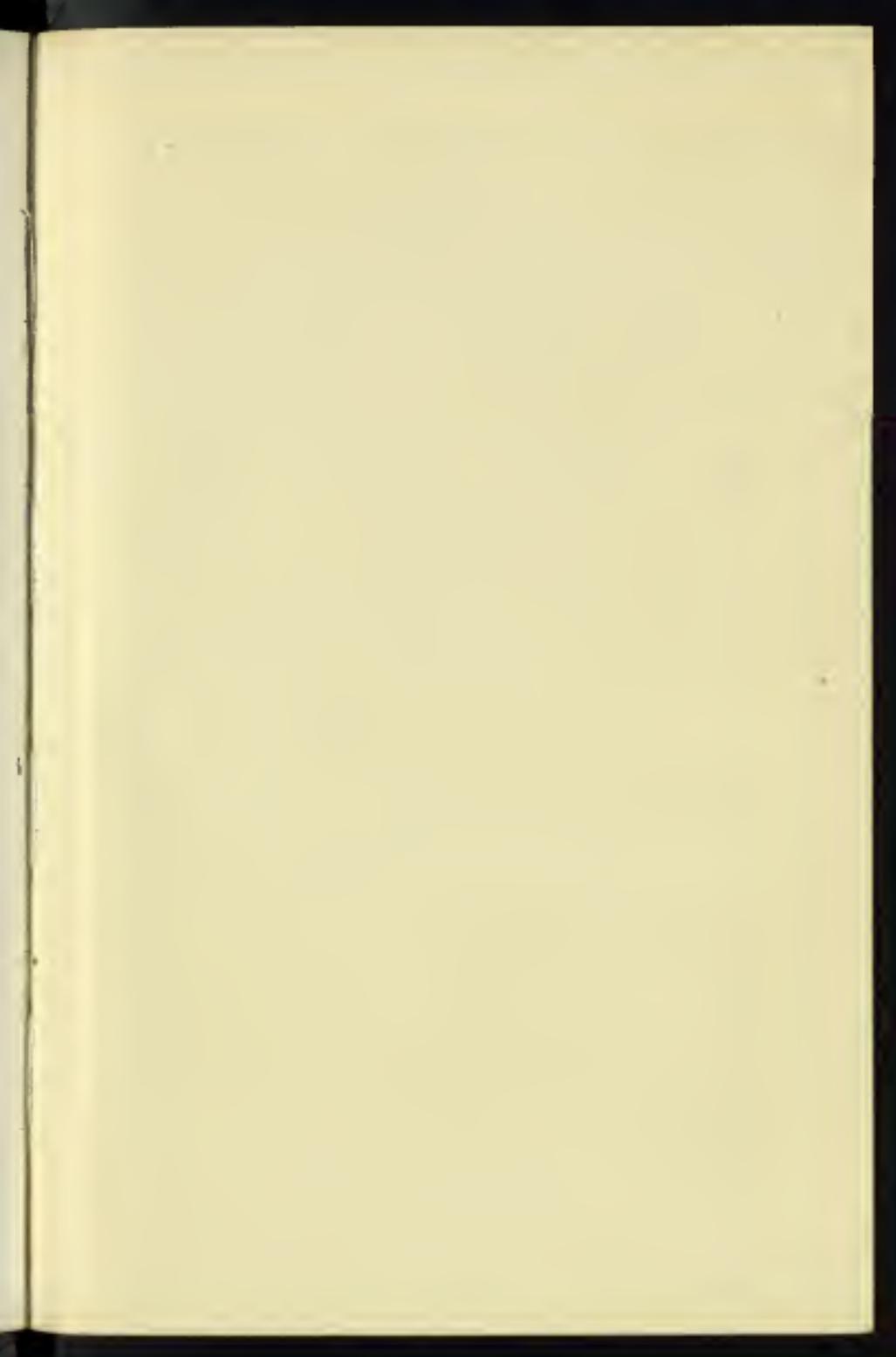


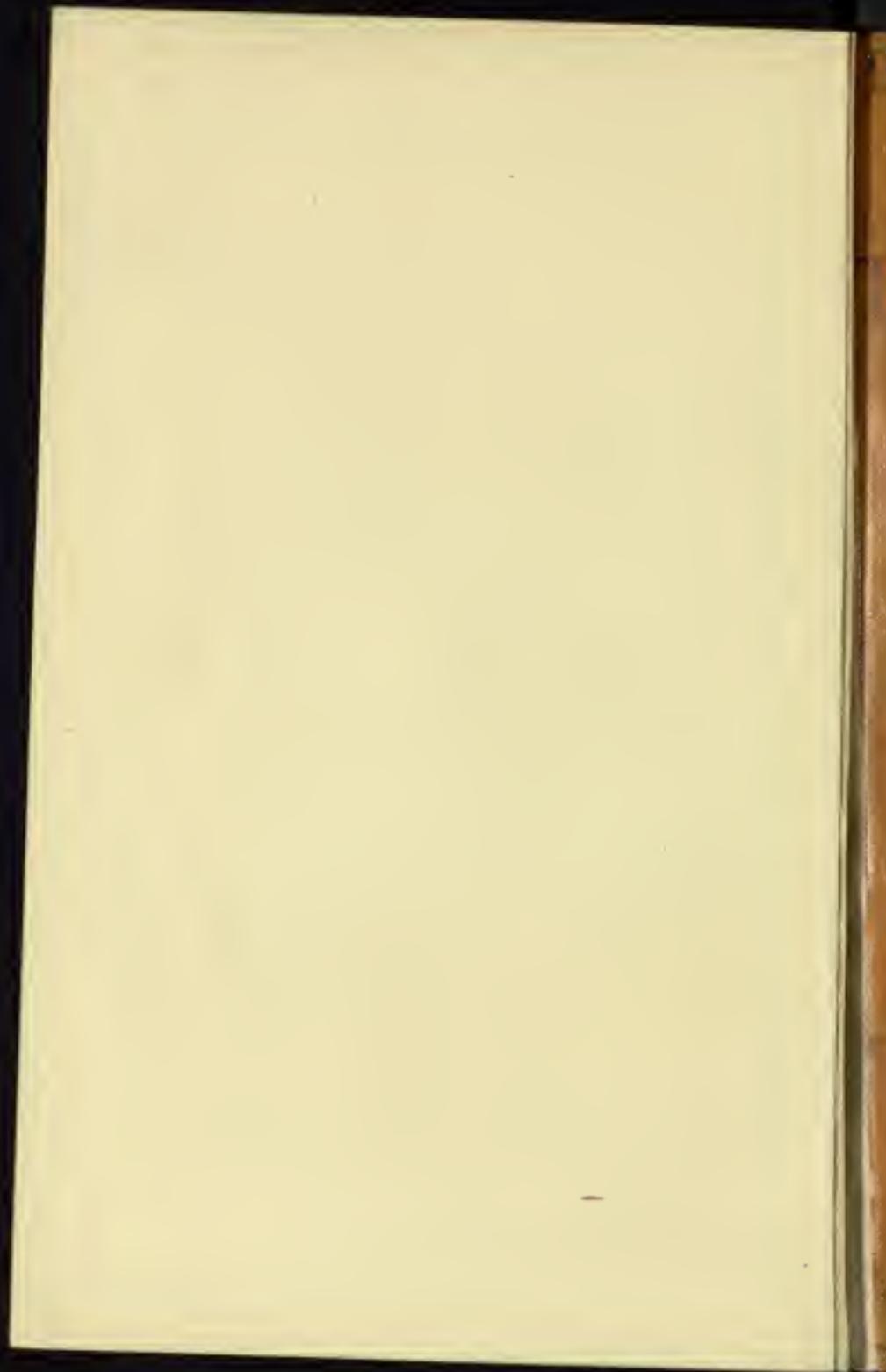
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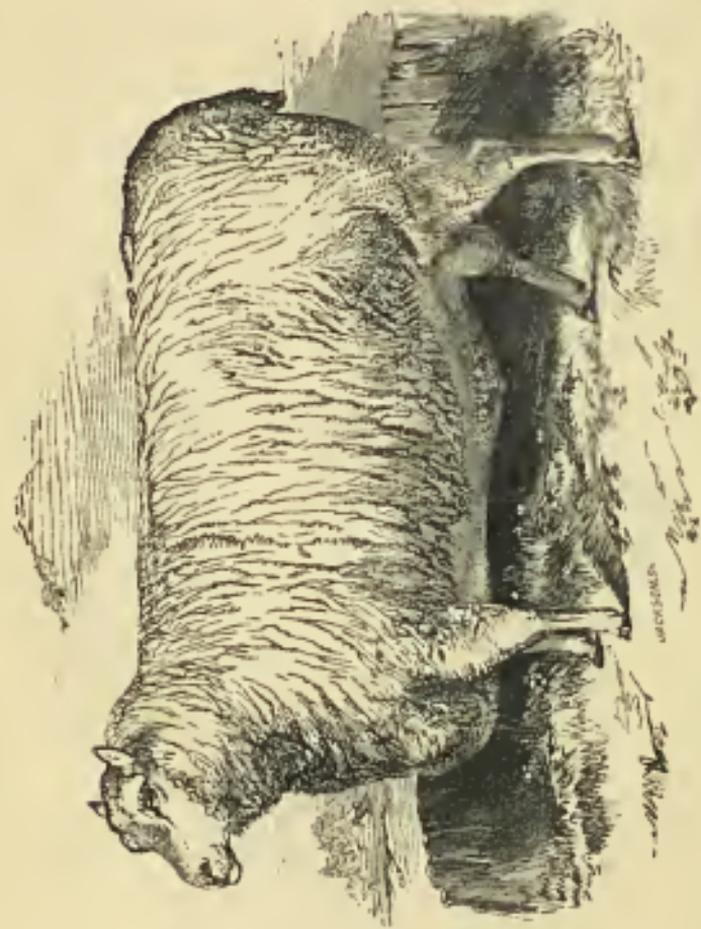
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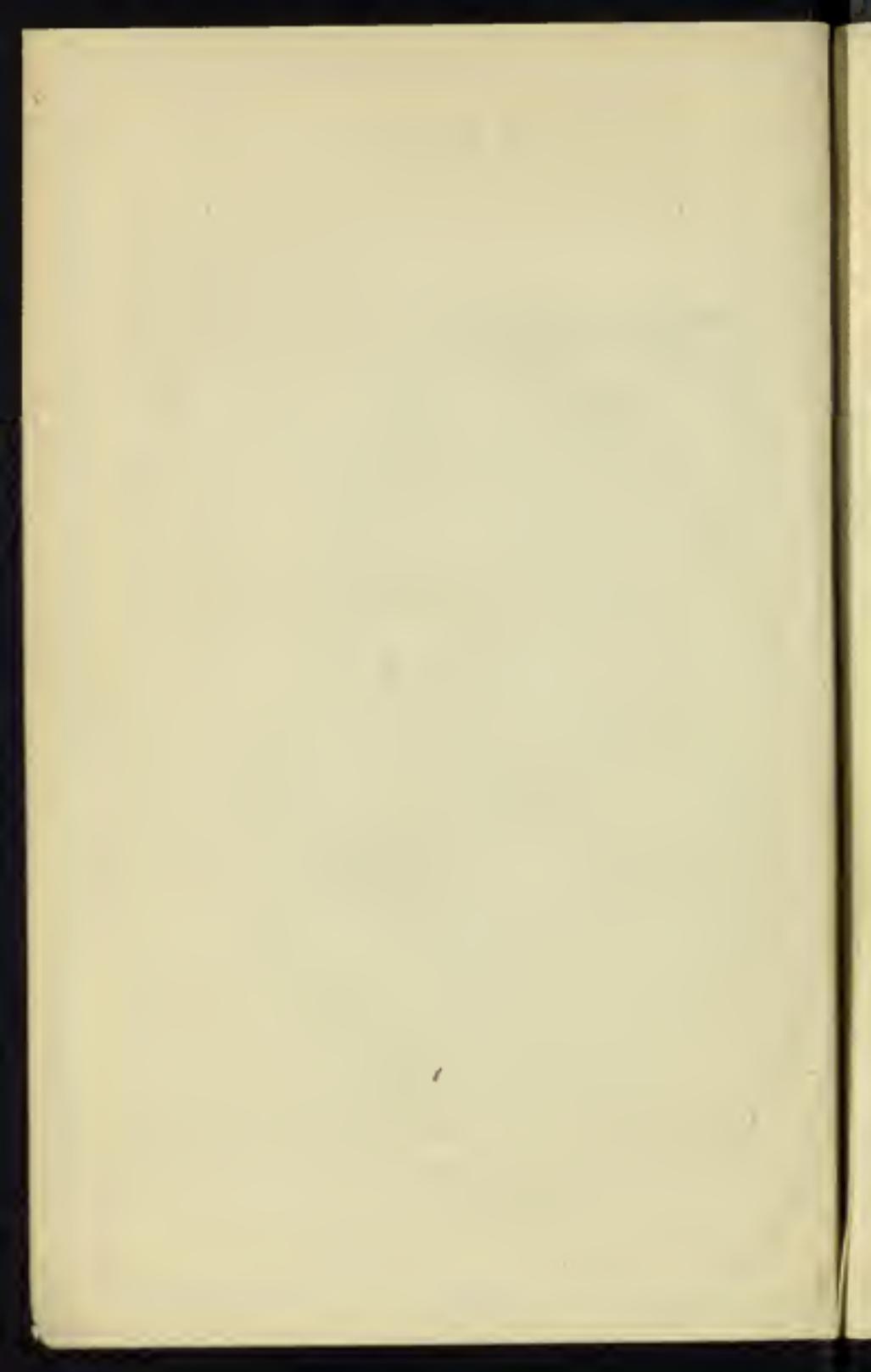
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# THE SHEEP.

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## CHAPTER I.

### GENERAL OBSERVATIONS ON BRITISH SHEEP.

WE must look at the domestic sheep (*Ovis Aries*, Linn.), whatever be its primitive origin, as an artificial being—it is what man has made it; and, like the dog, it shows the effects of his culture, persisted in through a long succession of ages. We are accustomed to regard the sheep as a purely wool-bearing animal; but was it so originally? Was it not, like the mouflon, covered partly with rigid hair and partly with wool, the latter becoming developed in winter? and is not the fleece which it bears in our climate, the result of culture, of temperature, and pasturage? We know that the latter influences the character of the fleece, irrespective of temperature; that certain lands are fitted for long-woolled sheep, while others are expressly adapted for short-woolled races. We know that, on the adjacent continent, different sheep are found in the same region. Sir Joseph Banks imported three sheep from Spain which had no wool; they “were sleek and smooth as a horse, and never, in any season, showed the least signs of wool or down in the most minute quantity.”—*Bath Society Papers*, vol. viii. p. xi. Yet Spain produces the celebrated Merino breed, reared on the great flats of Estremadura and Andalusia, where they are depastured during the winter; being driven, on the approach of summer, to the mountains. Besides these is the Chuanah breed—a large, tall, heavy race, with long, coarse wool, destitute of any curl. Here, then, we have sheep, clad with wool of a different character, under the same climate: there are breeds co-existing

## THE SHEEP.

in every part of Europe, between which a similar line of demarcation may be drawn.

With regard to climate, there can be no doubt that it affects the proportion of the wool to the hair, and influences the relative quantity, as well as the fineness and quality of the former. Regions which suffer neither the extremes of heat nor of cold, or in which, by a change of pasturage from lower to more elevated grounds, the heats of summer can be neutralized, and, by a reverse proceeding, the severities of winter can be moderated, seem most favourable for the development of wool. If we look at the sheep in very cold latitudes, we find it clad in an outer garment of coarse hair, beneath which lies an under layer of wool, which becomes fuller and longer in winter. Such is the case in the ordinary breed of Iceland. That this breed might be improved by care, we are quite willing to admit; due shelter, and a proper supply of food during winter, with general good management, would probably effect a considerable change; judicious interbreeding, care, industry, and intelligence, will overcome the difficulties of climate. It is thus that the Merino race preserves its excellences alike in Spain, in Germany, in Holland, and even in rigorous Sweden. The influence of *breed*, under proper management, will overrule the natural adverseness of climate; and thus man, by pursuing a well-regulated system, may conquer the intense severity of winter. These remarks apply equally to the sultry regions of the globe, where the sheep, gaunt and lank, are covered with short hair, sometimes with long hair, sometimes with hair intermingled with a little wool. Some breeds of Indian sheep, however, are clad with a fleece of wool, and the Merino breed is extensively cultivated in the colony of the Cape of Good Hope. It must be acknowledged, however, that the difficulty of contending against a sultry climate is far greater than that of contending against a climate of just the opposite description, as far as the rearing of fleece-covered sheep is concerned; and sheep of the best breeds imported into the hotter parts of the globe will rapidly degenerate. The establishment of the Merino sheep in the Cape colony, though neither pains nor expense were spared, was at first by no means attended by success, and was only effected by perseverance and unremitting attention.

In directing our attention to the breeds of sheep which may be justly regarded as British, a few preliminary observations will not be out of place.

As in the case of the ox, the sheep acquires different names at different periods of its life, and the same names are not alike applicable to both sexes.

The male is usually denominated a *ram* or *tup*. The term lamb is applicable to the suckling young of both sexes; but the male, until weaned, is distinguished as a *tup-lamb*, a *ram-lamb*, a *pur-lamb*; or a *heeder*. When weaned, until shorn (supposing him not shorn while a lamb), he is called a *hog*, a *hogget*, a *haggerel*, a *teg*, a *lamb-hog*, or a *tup-hog*; and if castrated, a *wether-hog*. After shearing, say when a year and a half old, he is called a *shearing* or *shearling*, a *shear-hog*, a *diamond* or *dinmont ram*, or *tup*; and if castrated, a *shearing wether*. *Hogget-wool* is the wool of the first shearing, supposing the *lamb* was not shorn while it retained that title. After the second shearing he is called a *two-shear ram*, *tup*, or *wether*; next, a *three-shear ram*, &c., the appellation indicating the number of shearings. In the north of England, and in Scotland, he is called, until his first shearing, a *tup-lamb*, then a *tup-hog*, after that a *tup*; or if castrated, a *dinmont* or a *wedder*.

The female, while suckling, is a *ewe-lamb* or *gimmer-lamb*; and when weaned, a *gimmer-hog*, a *ewe-hog*, a *teg*, a *sheeder-ewe*. After the first shearing she is called a *shearing-ewe* or *gimmer*; sometimes a *sheave*, or a *double-toothed ewe*, or *teg*.

Afterwards she is called a two-shear or three-shear, or a *four-tooth*, or a *six-tooth ewe* or *sheave*. In some of the northern districts, ewes not in lamb, or that have weaned their lambs, are termed *eild* or *yeld ewes*.

There are besides these, other terms not in general use, but restricted to certain localities, which must be regarded in the sense of provincialisms.

It is a singular fact, that the age of a sheep is not calculated from the date of its birth, but from its first shearing, though at that time it may be, in reality, fifteen, sixteen, or seventeen months old. How this custom arose we do not pretend to say, but it is established.

The age of a sheep may be pretty clearly ascertained by its incisor teeth. We need not say that the sheep has no incisor teeth in the upper jaw; it is a ruminating animal, with the same complicated structure of stomach as we have described in our history of 'The Ox,' and with its dentition upon the same plan as in the latter animal. The palate is marked by elevated transverse ridges, and these, thickening as they approach the fore-part of the mouth, merge into a dense, cartila-

ginous, and elastic pad of fibrous matter, covering the extremity of the upper jaw, and opposed to the oblique incisors of the lower jaw, which press the herbage against it with sufficient force to cut the tender stalk asunder, or to bruise it so much that a twitch of the head (as we see in sheep when feeding) is sufficient to separate it. The sheep, indeed, half bites, half tears its food, and consequently is perpetually pulling up portions of firm grass by the roots, to which particles of the earth adhere; these it swallows, not only with impunity, but advantage, inasmuch as the calcareous matter which the mould contains in greater or less abundance, tends to neutralize any acid that may form in the paunch from the fermentation of its vegetable contents.

We have described the muzzle of the ox as large and naked; in the sheep, the muzzle, on the contrary, is small and hairy, and the nostrils are oblique; the upper lip is divided, in order to allow the animal to bite the turf as closely as possible, so that it grazes much closer than the cow, and would live on pasture-lands where the latter would starve. Where flocks of sheep feed, they render the grass short, thick, and even, giving the turf a velvety surface. Their close cutting of the herbage prevents it from shooting up or becoming rank, and at the same time causes the roots to spread in every direction, and form a more united layer in the soil, so that they throw up fresh and more numerous sproutings in dense array. It is thus that sheep by their close feeding make good pasturage; for after they have eaten down the grass, it springs up with renovated vigour, close and even.

In number, the incisor teeth of the sheep agree with those of the ox, viz., eight; but they differ in certain points, inasmuch as there is a difference in the manner in which the two animals respectively crop the grass. In the sheep they are expressly formed for close feeding, and for nipping off the wiry stalks close to the roots, or even for nibbling harder food, as the shoots of the heath or broom. Not only are the teeth well covered with hard enamel, but this enamel rises on the edge of the tooth for nearly a quarter of an inch, presenting a convex surface outwardly on a concave surface within, so as to form a sort of gouge or chisel, capable of cutting a tough or wiry substance with admirable facility, and also of biting off the grass of the pasture grounds from the very root. The sheep may be said to *nibble* the herbage, the ox to graze.

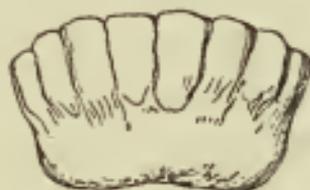
When the lamb is newly-born no incisor teeth are apparent

or only two just showing themselves; but their progress is rapid, and before the month is fairly completed the whole eight have made their appearance, rising up in due succession; still they are not developed to their maximum, for they continue to grow till the *lamb* becomes a *hog*, or in other words, for the space of fourteen or fifteen months. And now begins the wearing and absorbing processes, upon the same plan and routine as those described in 'The Ox,' only to a greater degree. The two central teeth are now shed and renewed, and the permanent pair are fully developed when the sheep is two years old from its birth. When between two and three years old, on the same calculation, the next in order on each side of the central pair is shed, and renewed, and completed by the end of the third year; at the age of four years, the next tooth on each side is developed (the milk teeth having been shed), and when the animal has completed its fifth year, all the eight permanent incisors are perfectly developed. The sheep is now said to be full-mouthed.

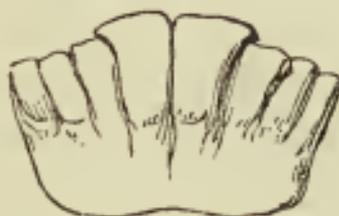
This is the ordinary routine; but let it be remembered that the sheep is a domestic animal, and influenced in the vigour of its constitution by diet, by locality, and the constitution of its parents. In some cases the dentition is retarded, in others accelerated. Mr. Culley, in his work on live stock, says—"Now respecting the judging of the age of the above animals, viz. horses and neat cattle, by the renewing of their teeth, though perhaps the best rule we know of, yet I cannot think it is always to be depended on. However, in sheep I am very certain we are very liable to be misled by it, and I apprehend much depends upon being *early* or *late* lambed (a most judicious observation), well or ill fed, and so on. Particularly I have frequently known tups to have what we call *four broad* or *renewed* teeth, when, by the ordinary rule, they ought to have had only two. A friend of mine, and an eminent breeder, Mr. Charge, of Cleasby, a few years ago showed me a *shearing tup* (that is, after the first shearing at fifteen or sixteen months old, when he loses the name of *hog*), at Richmond, in Yorkshire, for the premium given by the Agricultural Society there, which had *six broad teeth*, in consequence of which the judges rejected Mr. Charge's tup, though confessedly the best sheep, because they believed him to be more than a *shearing*. However, Mr. Charge afterwards proved, to the satisfaction of the gentlemen, that his tup was no more than a *shearing*."—(p. 213.)

In examining the teeth of the sheep, the mouth should be fairly opened and the teeth counted, and not left to the glance of the eye alone, however practised, for it often happens that at four years old the mouth is apparently full with broad teeth, no small external corner teeth being visible; but in fact these teeth do exist, but being small or reduced, are displaced by their neighbour on each side, which starting up before them, prevents their being readily seen. Now unless the teeth are counted and fairly examined, the six visible teeth may be taken for eight, and the animal be estimated at five years of age.

The following cuts show—1, the incisors at the age of about fifteen months; 2, at the age of two years; 3, at the



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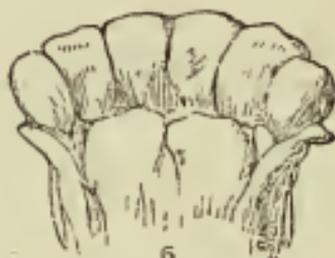
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age of three years; 4, at the age of four years; 5, at the age of five years; and 6, the deceptive appearance last described, as sometimes occurring in a four year old sheep.

When the mouth of the sheep is completed, it is difficult to judge of the age of the animal afterwards. The teeth wear down at a different ratio on various pasture grounds, and according to different modes of feeding. Often they become broken, at other times they loosen and fall out, not perhaps from age so much as from constitutional predisposition, or delicacy of constitution, or from what is called close feeding on scanty and short pasturage, and sometimes perhaps from the influence of locality. One, two, or three years, according to circumstances, may elapse before the decline and fall of the teeth commence; but when the teeth exhibit these signs of disintegration, the sheep has passed its grand climacteric, unless, indeed, accidental causes have greatly contributed to their destruction. Yet, supposing this to be the case, the loss of incisors to the sheep would in itself be the cause of decline, for on these incisors depends the power of procuring food.

In the dog, on the contrary, which often loses its small incisors at an early age, as long as the canines and molars are sound their loss is not materially felt.

How long the farmer may deem it necessary to keep a sheep when, after the sixth or seventh year, its incisors show symptoms of decay, will depend upon many contingencies, and upon motives alien to the common order of affairs; but neither in wool nor in flesh can he expect much remuneration. The average age at which sheep are killed is from two years to four or four and a half, sometimes five, but after this period their wool begins to decline in value, and they lose much of their tendency to fatten; we are here speaking of ewes, and of these how many come to the butcher at an early age! Quick and early fattening is, under many circumstances, the farmer's chief profit.

It is very difficult to say what is the natural age of the sheep; and we have no data respecting the wild mouflons or argalis by which to be guided. Perhaps we may estimate the natural duration of the life of this animal at from twenty to thirty years. Mr. Culley says, "I have heard of particular sheep living to near twenty years old—those which the mountain shepherds call *guide sheep*, viz., old wethers kept to guide and direct the bleating flocks upon those unfrequented wilds. It is not perhaps naturally that the sheep ceases to be productive till late in life. It would appear to be a law among quadrupeds generally, that the failure of the reproductive powers is speedily followed by death; they have accomplished the great purposes of their existence, and must yield up their place to others. Mr. Moore, of Winthorpe, had on his pastures, in 1824, a ewe that yeaned a pair of lambs when she was a *shearling* (fifteen or sixteen months old), and had afterwards *two pairs yearly* for fifteen years; and then, for two more years, single lambs at each yeaning.

We need not dilate upon the skeleton of the sheep. It offers nothing that need particularly detain us, being typical of that of the smaller ruminantia in general. The ribs are thirteen on each side, the dorsal vertebræ being of course of the same number. There are six lumbar vertebræ, and those of the tail vary in different breeds from twelve to twenty-one.

With the skeleton of an animal, its symmetrical proportions are intimately connected. Our various breeds of sheep, however, differ somewhat from each other in external form, and no doubt according distinctions might be traced in the osseous

framework. These distinctions would necessarily be confined to a few minor peculiarities, and we are not aware that a comparison of them has been attempted. The form of the skull, the stoutness or slenderness of the bones of the limbs, the flatness or arching of the ribs, the expanse of the sacrum and haunch bones, would offer themselves most prominently to notice. How far such an investigation would be profitable may admit of doubt; the eye of the farmer as he looks upon a sheep requires but little other aid, nor will his experience fail him, albeit he knows nothing, by personal investigation, of anatomical minutiae.

But although the eye of the farmer can at once detect the characteristics of different breeds and fully appreciate them, yet there are certain points which, on every well-bred sheep, he expects to meet with.

With respect to the *Ram*.—His head (as Mr. Culley, no mean judge, asserts) should be fine and small; his nostrils wide and expanded; his eyes prominent or rather bold and daring; his ears thin; his collar full from his breast and shoulders, but tapering gradually all the way to where the neck and head join, which should be very fine and graceful, and perfectly free from any coarse leather hanging down; the shoulders should be broad and full, and at the same time joining so imperceptibly to the collar forward and the chine backward, as not to leave the least hollow in either place. The muscular development (or mutton as it is called) upon the arm and fore-thigh must come quite to the knee; the legs should be upright, with a clear fine bone, and from the knee and hough downwards equally clear from superfluous skin and coarse hairy wool; the breast should be broad, and advanced well forward, separating widely between the fore-limbs; the chest should be full and deep, with no falling in behind the shoulders; the back and loins should be straight, flat, and broad; the ribs rising from the spine, with a fine circular arch; the belly should be straight, not bagging; the quarters long and full, well fleshed down to the hough; the houghs should stand parallel, neither in nor out; the twist or junction of the inside of the thighs, wide and proportionate to the distance of the fore-arms, so that the pillars of support accord in due symmetry with each other, well supporting a rounded and developed volume of carcase. The pelt should be moderately thin, and the wool fine, bright, and soft.

The nearer any breed of sheep, says Mr. Culley, comes up

to this description, the nearer it approaches towards excellence of form. But Mr. Culley takes the Dishley breed of Leicestershire as his standard; a breed remarkable for its fulness of form, its early maturity, its propensity to fatten, the small proportion of offal, and for returning the most money in proportion to cost of keeping.

Let us, however, add to this picture the sketch of a few other breeds. We will first take the Southdown, which, as far as mutton is concerned, to our taste at least, is almost unrivalled.

The head is small, compact, and hornless; the face of moderate length, and, to use a sculptor's phrase, neatly outlined and chiselled; the lips being thin and definite, and the space between the nostrils narrow but sharp. The face should be dashed with brownish gray; the forehead, the ears, and the space between the ears well covered with wool. The eye should be clear and bright, but not prominent. The neck should have a graceful *townure*, thin at its junction with the head, but enlarging towards the shoulders and chest. The breast should be prominent, wide, and deep. The set-on of the shoulder blades should be oblique, and the ribs should arch boldly, so as to produce a well-barrelled carcass. The loin should be broad and flat, the rump long and broad, the tail set-on high, that is, on a level with the back, the hips wide, and close up to the last rib on each side. The belly should be well supported and straight, and also covered with wool. The limbs should be far apart, muscular, and full; the shanks clean, fine boned, well knit, and covered with short woolly hair of a rusty gray or brown tint. The fleece should be short, close, fine, curled, and free from kemps or projecting hairs.

Let us next turn to the Cheviot sheep, now improved by crossings with the Leicesters. The head is bare and clean, the ears are rather long, the chaffron is somewhat convex, and the jaws are considerably elongated; the face, formerly dusky, as were also the limbs, is now white. The neck is full and round, the chest open, and the general contour of the body round and full. The legs are clean, and clad with wool to the knee joints and hocks. The fleece is of a medium length, close-set and fine, and should be equal in point of quality on every part; it is, however, apt to be curled about the shoulders, and coarser on the hips, tail, and belly, than elsewhere; but in the improved stocks a great

amelioration in these particulars has taken place, and the modern Cheviot assumes an important station among British sheep, and is encroaching on the black-faced sheep of Northumberland, Cumberland, Westmorland, and the hilly districts of Scotland. This black-faced breed is horned, wild-looking, active, and hardy; it has been much improved of late years, the carcase being compact, short, and rounded, and has thus acquired the appellation of the *short sheep*, in contradistinction to the Cheviots, which are called *long sheep*.

From these observations relative to the contour of the sheep, we may pass to a closer scrutiny of our principal breeds. It was formerly the practice to divide our sheep into two classes, namely, LONG-WOOLLED SHEEP,—that is, sheep affording *combing* wool; and SHORT-WOOLLED SHEEP—that is, sheep affording *clothing* wool; and it must be confessed that until lately such a division was tolerably accurate, although wools of intermediate lengths and qualities not unfrequently created some difficulty as to which section they ought in reality to be assigned.

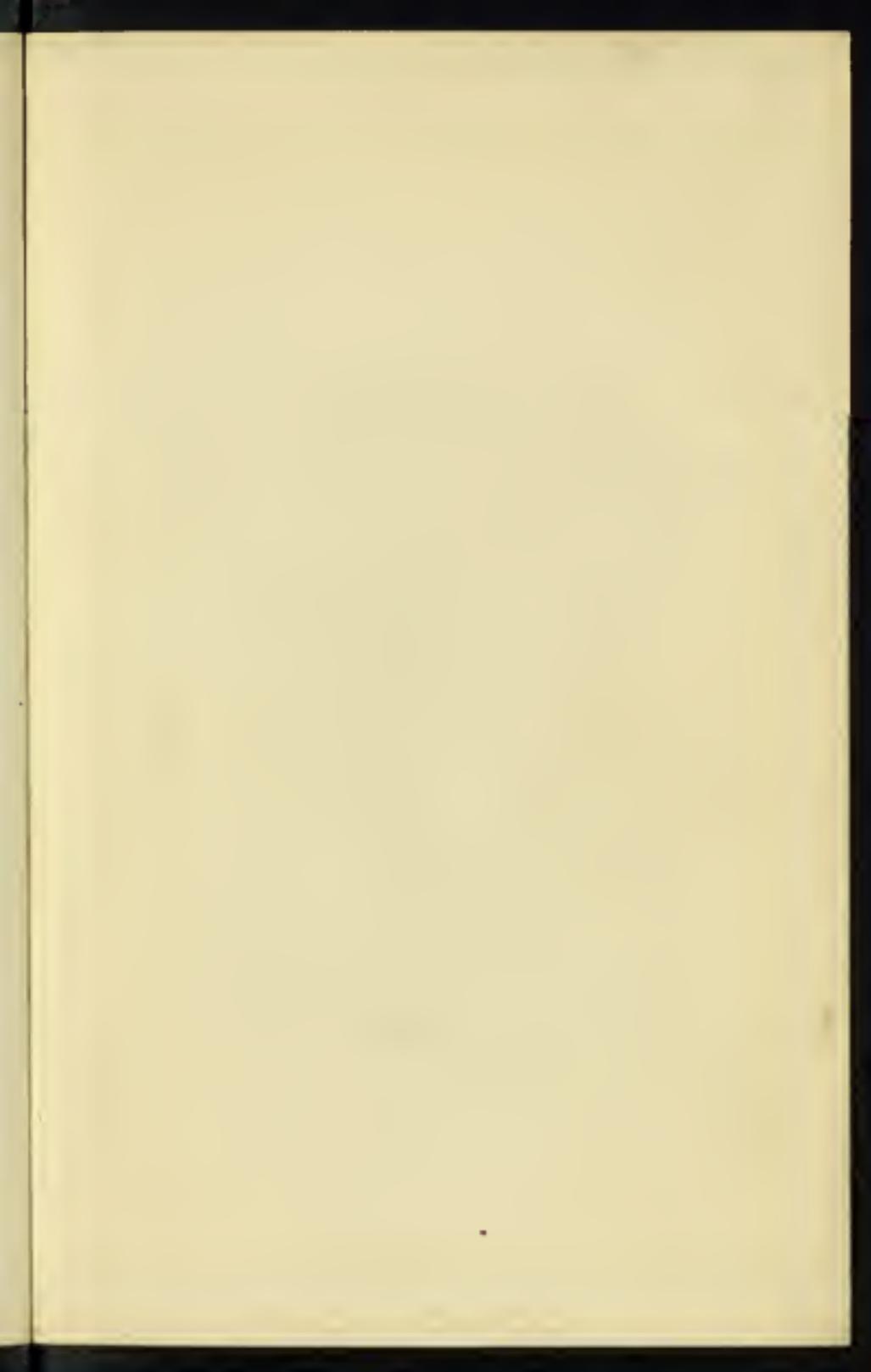
Since, then, the term *short wool* is no longer strictly applicable as a general appellation to the produce of our own once short-woolled breeds, it has been proposed to exchange the term for that of *middle wool*; and looking at our native *long wool* on one side, and our *imported short wool* on the other, this term is expressive of its leading character. Under this head will rank the Ryeland, the Dorset, the Norfolk and Suffolk, the Southdown, the Cheviot wools, together with wools of some other breeds, in all of which the staple of the fleece has gradually lengthened and increased in stoutness. In short, these wools, no longer applied to the purposes to which they were formerly, when the title of short wool was their due, are prepared as much by the combing as the card; and although they do not realize the extravagant prices they formerly did, yet owing to many circumstances they meet with a readier sale, while, to make up for any deficit on this head, the earlier maturity of the carcase, its improvement in weight, and its amelioration in quality, are more than make-weights in the balance in favour of the modern sheep-grazier. Mr. Youatt, speaking of the fine old short wools, judiciously observes, that the gradual introduction of other wools possessing delicacy of fibre, pliability, and felting qualities beyond what these could boast of, and at the same time cheaper in the market than

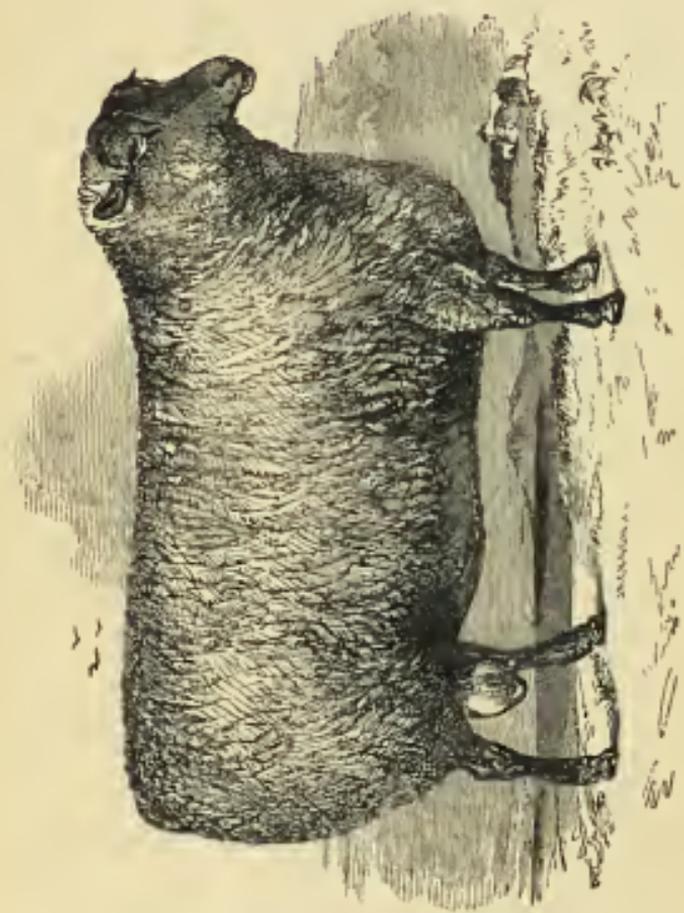
the old British wools ever were or could be, has gradually caused the latter to lose ground in the manufacture of the finer cloths, so that now our home-grown short wools cease to be used in their production. If, however, they are no longer essential for clothing or fine broad-cloths, the change which has taken place in the construction of machinery has multiplied the purposes to which they may be devoted; they may indeed be looked upon as *short combing wools*, and of no ordinary importance.

In one sense the short wools of our country have deteriorated. Some would say *no*, they have only changed, and that in consequence of the improvements in breeding, the attention shown to size, symmetry, and early ripeness, and the intercrossings which under these aims have taken place; whether we call it deterioration or alteration, the fact is the same, and cannot be gainsaid. Our short-woolled sheep are heavier than they used to be, their fleeces also are heavier and coarser.

#### THE SHORT OR MIDDLE-WOOLLED BREEDS OF SHEEP.

Among our native *short-woolled* breeds (we use the term *short-woolled* because it is in common acceptance), the Southdowns have long stood conspicuous. It were idle, and more than that it would be fruitless, to attempt to investigate the original source of our short-woolled races, or to attempt to analyze the causes which led to their peculiar character of fleece, as distinguished from that of the long-woolled breeds of our Island; yet it has often struck us that in the Southdowns (now greatly improved) we see the descendants of a very ancient lineage. The Southdowns, strictly speaking, are confined to Sussex; they rise from the Marsh of Pevensey to the bold promontory of Beachy Head; they then trend westward as far as Shoreham, occupying a surface of about twenty-six miles in length, and six or seven in breadth, containing 99,840 acres. This tract is properly denominated the South Down. From Shoreham the Downs gradually recede from the coast and traverse the western part of the county, bearing some points towards the north, and enter Hampshire between West Harting and Stanstead, near Petersfield. Their extreme breadth in Sussex is fifty-three miles, their greatest breadth seven, and mean about four miles and a half. The average height is about 500 feet above the level of the sea; but Ditchling Beacon is 858 feet, Firle Beacon 820 feet. Chanc-





South-Down Ram, p. 13.

tonbury Ring 814 feet, Rooks Hill and Bow Hill each 702 feet, and Beachy Head 564 feet above that level. The Downs have a rich covering of short and delicate turf, containing large portions of wild thyme (*Thymum serpyllum*), and occasional patches of the common furze, the *Ulex Europæus*, in patches of thirty or forty acres. The whole district is without trees, except in some declivities, where the white thorn is found, and in some of the richer portions of Stanmer and Arundel parks, where thriving plantations of beech and other hardy trees have recently been made. The surface of the Downs is gracefully undulating; the northern escarpment is precipitous, whilst the southern declines gently, and westward of Brighton gradually blends with the lowland of the coast.

Such is an outline of the general characters of the Downs of Sussex, the nursery and congenial home of the breed of sheep in question.

Formerly the Southdown sheep were very indifferent; it is true that they carried very fine wool, but then the carcase was ill-formed, a disadvantage which more than counterbalanced the excellence of the fleece. They were small, thin in the neck, high in the shoulders and in the loins, down on the rump, with the tail set very low; the back was sharp, the ribs flat, and the fore-quarters narrow; yet there were materials to work upon, and besides, these sheep had some excellent qualifications; they arrived at early maturity, were extremely hardy, thrived upon scanty keep and short feed on the natural pastures, and the mutton was fine-grained and of good flavour.

Attempts were first made to improve the Southdowns by crosses with the Leicesters, a long-woolled sheep, but these attempts ended in utter failure, nor were crosses between them and the Merinos ultimately advantageous. It was by careful selections, and the keeping in view of a definite purpose in the choice of breeding stock, that the improvement of the Southdowns was achieved. It is to Mr. Ellman of Glynde that the elevation of this breed to its unrivalled position in its own line as a hill sheep is due.

Mr. Culley, in his *Live Stock*, 1807, notices the exertions "of the ingenious Mr. Ellman, whose flock is already superior to that of most of his neighbours, both in carcase, quantity, and quality of wool." This enterprising and skilful breeder did not, however, content himself with mediocrity; and in the

*Annals of Agriculture*, vol. xx. p. 224, Mr. A. Young thus speaks of Mr. Ellman's Southdowns:—"His flock, I must observe, is unquestionably the first in the country, the wool the finest, and the carcase the best proportioned. Both these valuable properties are united in the flock at Glynde. He has raised the merits of the breed by his unremitting attention, and it now stands unrivalled." Mr. Ellman's own description of them is very unpretending. He says (*Annals of Agriculture*, vol. xvii.) they "are now much improved both in shape and constitution; they are smaller in the bone, equally hardy, with a greater disposition to fatten, and much heavier in carcase when fat. They used seldom to fatten until they were four years old; but it would now be a rare sight to see a pen of Southdown wethers at market more than two years old, and many are killed before they reach that age." Doubtless the age is reckoned, as is usual with sheep, not from the time when lambed, but from the time of the first shearing, — a point always to be borne in mind unless the contrary is expressed.

When any spirited individual commences a system of improvement, he communicates a stimulus to others, and if he have the public good at heart, diffuses around him the means by which others may be enabled even to compete with himself. Certain it is, that Mr. Ellman's improvements led to the rapid amelioration of the Southdowns throughout the whole of their range; and now if we look at the quotations in the Smithfield market, we find the estimation in which they are held.

The average dead weight of the Southdown wether varies from eight to eleven stones, but at the Christmas show there are usually some pens in which the sheep average eighteen or twenty stones; but these are picked sheep, and fed high for the occasion.

No sheep are more healthy than the Southdowns. They are seldom affected by the rot nor do they often suffer from hydatids in the brain. This general good health is owing partly to the nature of their pasturage, their change of food, and the good fresh air of the breezy hills, and partly to their journeys of two or three miles twice a-day from the fold to the pasture, and from the pasture to the fold, a plan of treatment which the Leicesters would not bear, and one of the reasons why they will not succeed on the Downs.

To the alteration in the character of the wool of the South-

downs we have already adverted. We may here add, that the hogget wool, that which is left on the sheep untouched till the second shearing, and which was always used as a combing wool, has decidedly become more valuable since the present system of management; while its length is very considerable, it is finer than the ordinary long wools, is far more disposed to felt, and is applicable to more numerous and more profitable purposes.

Though the Southdowns succeed best on our southern ranges of chalk hills, yet they have penetrated into almost every part of the country, and generally thrive where locality and soil suit them. The northern hills, however, where the Cheviots and black-faced breed prevail, are unsuitable for them. Crosses between the Southdowns and other breeds of middle-woolled sheep have been found to answer very well; and indeed in Western Sussex the prevalent stock is a breed apparently between the Somersets and the Downs, and heavier than the latter. In Hampshire the old black-faced race is crossed by the pure Southdown. The latter has either usurped the place of, or greatly modified the old Berkshire, and this race prevails in many parts of Kent, while the Romney Marshes bred a breed of long-woolled and valuable sheep which has existed there time immemorial. The Wiltshire sheep is but a variety of the Southdown; and in Dorsetshire, Norfolk, Suffolk, and Cambridgeshire, crosses with the Southdown prevail; indeed the Southdowns are contending not unsuccessfully with the old breeds of those countries, and may perhaps, if not supersede them, curtail the extent of their range.

On the other hand, in many parts of Sussex, Somersets and Dorsets are kept for the sake of early lambs for the London market; these lambs are ready for the market often before Easter, while the Down lambs come to the market in June or July. In the vicinity of Petworth (a market town in the hundred of Rotherbridge and rape of Arundel) great numbers of grass lambs are fed for the metropolis. The breed there kept is the Dorset (a horned breed), and the ewes drop their lambs in December, and nearly to the time of yearling are kept on stubble grounds, then on turnips and artificial grasses. After the removal of the lambs the ewes are fed as high as possible—that is, if the farmer has not expended his food on the lambs—and put with the ram. Ewes impregnated at this early season are valuable to the house lamb

farmer, who purchases them from the field lamb farmer, and if successful may count upon profit.

The great mart for the sale and purchase of wool in Sussex is at Lewes; a stock market is held every fortnight, and a wool fair is held on the 20th of July. A fair is held at Petworth, on the 20th of November, for sheep; at Chichester, on the 20th of October; at Lindfield, on the 5th of August; and at Finden, on the 14th of September.

Throughout a great portion of Kent, along the range of the North Downs, where the ground is open, and is covered with short pasturage, the Southdown sheep are extensively cultivated. But Romney Marsh and the adjacent tracts constitute the head-quarters of a long-woolled breed known as the Romney Marsh sheep. In some of the more eastern parts of the county a mixed breed is found between these sheep and the Southdowns. They are kept on the upland pasture grounds, and yield a good and serviceable wool. On that portion of Kent called the Weald great numbers of Romney Marsh lambs and Southdown wethers are fed during the winter. At this season of the year the grazing lands are covered with stock of different kinds, but throughout the summer months comparatively few sheep are to be seen.

In the county of Surrey the Southdown breed extensively prevails, and is well suited to the short feed of the chalk hills; but there are smaller varieties of this race on some of the wild and sterile heaths so abundant in this county. These small hardy sheep are celebrated for the excellence of the mutton; and among them the Banstead Heath sheep have long been famous. This small breed is clad in a short, thick, and close fleece—a circumstance of some importance—but the mutton is unrivalled. The Merry Monarch, Charles II., loved Banstead mutton; nor has it yet lost its reputation.

But besides the Southdowns and these small heath sheep, various other breeds are to be seen in Surrey, and among them the Dorset; not that the latter sheep are bred in Surrey, but the ewes are purchased in autumn by the light-land farmers, in order to rear early lambs for the London market, and in the spring, after the lambs are sold off, they are transferred to the graziers of Essex and other counties to be fattened, so that flocks of Dorset sheep are not permanently kept on any farms, although Dorset grass-fed lambs are sent in April and May from Surrey to the metropolis.

If we turn to Berkshire we there find the Southdowns prevalent, the old indigenous breed having either been superseded by them, or so interblended by frequent crossing as to have lost its original characters. The chalk hills are in the almost exclusive possession of the Southdowns, but in the rich vales a heavier crossed sheep is found, and in some parts Dorsets are kept for the sake of early lambs.

The old Berkshire sheep was generally but not always horned; the chaffron was arched and black, the legs black or mottled, the wool was short and coarse. These sheep were tall and of large size; they were slow to fatten, but when fat the wethers weighed from ten to thirteen stones (of 8lbs.), and occasionally much more. Prize wethers have been known to weigh as much as twenty-two stones.

We may now follow the Southdown sheep into Hampshire. Here, as in Surrey, they have superseded an old stock, generally horned, which is no longer to be seen. Not that the Southdowns are altogether pure. They are more or less crossed with other breeds, producing a round-barrelled, short-legged animal, capable of thriving on short pasture and easily fattened. The Hampshire west-country sheep are crossed with the Somersetshire breed. They are larger and coarser than the Southdowns, with more wool about the face and less black on the face and legs. Perhaps they do not bear stocking so closely as the Southdowns. Nevertheless, they are valuable animals, and well adapted for good sheep farms.

It is generally the custom of the Hampshire farmer to stock close, and feed the land off as clean as possible. When the food is all exhausted the farmer carries straw to the ground, and pens the sheep at night upon it. They are thus supplied with a comfortable bed, which being trampled into the ground and mixed with the dung, forms in its turn a very valuable manure; and in this manner, at little cost and trouble, the ground is cleaned and enriched. No sheep are so well fitted for this system of management as the Southdowns, or the breed in which their strain is prevalent. Early lambs are not in general reared; a few farmers perhaps may find profit in rearing for the early markets, in which case they part with their stock yearly. For this purpose Dorset ewes, or west-country Down ewes, crossed by Southdown rams, are selected. In this county, sheep and wool are of great importance to the farmer; and it has been calculated that the number of sheep,

exclusive of those of the Isle of Wight, averages 516,000. The fleeces average 3lbs. each.

With regard to the Isle of Wight, several breeds of sheep are there maintained, according to the nature of the ground and the views of the farmer. On the ridge of hills which crosses the island from east to west, flocks of Southdowns, little inferior to those of Sussex, are found; but in more inclosed parts Somersets and Dorsets are kept for the sake of early lambs. Few, however, if any, of these sheep are bred there. The ewes are mostly purchased forward in lamb, at some of the fairs in the west. These ewes are crossed with the Southdown ram, the lambs resulting from this intermixture being generally hornless, and, having black faces and legs, closely resemble in appearance true Southdown lambs, and indeed pass in the market as such, although the Southdown ewes year so much later in the season, that no lambs of this genuine breed can possibly appear in the market. Southdown lambs, however, are deemed of far superior excellence to Dorsets or Somersets, consequently early *so-called* Southdowns meet with a good and ready sale. These lambs, it is true, are half Southdowns; but only on the side of the male parent.

Sheep are of great importance to the Isle of Wight farmer; and it is of consequence that his lambs be early, in order that they may be fattened off on his turnips, which would not keep for late yeaned lambs; besides which, he has no water meadows or grass crops on which to fatten for the market lambs yeaned even a few weeks after those produced by the Dorset or Somerset ewes. It is calculated, that in this island the number of sheep kept exceeds 52,000, exclusive of 8000 lambs.

We may follow the triumphant invasion of the Southdowns into Wiltshire, where they have completely superseded or modified the old horned race. The old Wiltshire sheep was evidently a mere variety of the Dorset, and was well adapted for the high chalky downs and wild pasture lands of the south-eastern portion of the county. These sheep were horned, the horns turning back over the ear; the head was large, the chaffron long and arched, the eyes large, the nostrils wide, the chest deep, the back straight, and the legs long and large boned; the wool was fine, and in considerable estimation. These sheep were hardy and active, and would bear a double journey daily to their pastures in the morning, and their fold in the evening. They were, however, slow

fatteners, but when fattened often attained to a very great weight.

This breed extended from the Wiltshire Downs into North Devon, Somersetshire, Berks, and Bucks, but is now obsolete. It was not a breed of which the farmer could keep a young stock with advantage. It was his aim to sell off his wether lambs, or at least the greatest portion of them, soon after midsummer, and the remainder in the course of the succeeding year. They were fattened in various counties for the London market. Of ewes he was anxious to have a good store, for the sake of breeding, but he never attempted to fatten.

This breed, by repeated crossings and inter-crossings with the Southdowns, ultimately lost all its original characters. It merged, in fact, into the Southdowns, forming a variety scarcely to be distinguished from the genuine Sussex sheep, except perhaps by superior size, lighter colour, and a finer fleece, more particularly in the lowland pastures of the county, where these sheep are larger than their Down-fed relatives, and have a heavier fleece.

Besides the Southdown sheep, flocks of crossed Merinos, that is, crosses of Merinos with the old Wiltshire breed, are still to be seen in this county. These sheep greatly resemble the true Merinos. They are hornless, and carry close compact fleeces of very superior excellence.

In Dorsetshire, Somersetshire, Devonshire, and Cornwall, Southdown sheep are kept in considerable numbers, and have more or less influenced the old breeds of those counties.

The pure breed of Dorsetshire is celebrated for the production of early lambs; and, as we have stated, the pregnant ewes are purchased by farmers in various parts of the country, who find their advantage in sending early lambs to the London markets. Both the males and the females of this breed are horned, and have white legs and faces, but when crossed by a Southdown ram, the lamb is generally hornless, and the face and limbs are clouded. (See our notice of the sheep of the Isle of Wight.)

The following short outline, relative to the Dorsetshire sheep, was communicated to us by a gentleman familiar with this peculiar and valuable breed:—

This breed, he says, prevails not only in most parts of Dorsetshire, but is kept also in the low pastures of Wiltshire and in Somersetshire. "It grows to a good size, say one-

fourth larger than the Down, is of a longer contour, both as to leg and body, is horned, white in the face and legs, moderate as to the length of wool, the fleece being close and heavy; grows to good mutton, but is not so quick in fattening as some other breeds.

"The Dorsetshire ewe at the due age is usually put to a Down ram very early in the season, say about July; and in a pregnant state large flocks are brought for sale to Weyhill Fair in Hampshire, in September, whence they are purchased by dealers and farmers, and brought to the home counties, say Sussex, Surrey, and Hertford, chiefly for the sake of the early lamb, which is much esteemed in the London market. They are excellent milkers and nurses. After the removal of the lambs, the ewes are generally grazed in the same locality, and made ready as soon as possible for the butcher."

The pure Dorsetshire sheep is long in the face, with the nasal bones arched, and the forehead tufted with wool. The horns of the male are large, stout, and boldly spiral; those of the female are smaller. These sheep fold well, and the wethers, when three years old, average from 16 to 20lbs. the quarter.

The early grass lambs are dropped in December or in the beginning of January, and are put with the mothers into dry, warm, and well-protected inclosures. Here the ewes are supplied with turnips, hay, and other food, so that they may have a good flow of milk. This, indeed, is very important, insomuch that from time to time the farmer examines the flock one by one, in order to ascertain the condition of the udder.

In this county many farmers rear house lambs on an extensive scale. Lambs for house rearing are dropped in September, the ewes, being forwarded by means of high keep, having been put to the ram in April. For the purpose of rearing house lamb—one of the luxuries of modern days—it is requisite to have a building purposely constructed, with every attention to warmth, comfort, and convenience. Internally this building is divided into numerous coops, for the reception of the lambs according to their ages.

"Every evening the ewes are turned into the respective divisions of the lamb-house, where each mother speedily recognises her own offspring, and affords it suck. They remain together until the following morning, when they are separated, and the ewes driven back to the pasture.

“About two hours after the departure of the mothers, those ewes which have lost their lambs, or whose lambs have been sold, are driven into the house, and held until their udders are perfectly emptied by the lambs, when they are taken away and placed in their own separate inclosure. At twelve o'clock the natural mothers are brought again, and remain for about an hour or two. At four o'clock the foster mothers are again brought, and compelled to pay another visit of an hour's length; and at eight o'clock the natural mothers return to pass the night with their offspring.

“The most scrupulous attention is paid to the cleanliness of the place. The lambs are supplied with good wheat straw for them to nibble, and pieces of chalk to lick.

“The ewes are kept in an adjacent and well-sheltered pasture during the day, and are plentifully supplied with green food, grains, turnips, rye, tares, clover, &c.—the food being varied, so that the sheep are not only kept in the best health, but their flow of milk is maintained in rich plenitude; for the farmer well knows that, should the milk of any ewe fail, even for a short time only, the lamb is lost to the market, and that no system of forcing can ever afterwards restore him to the requisite degree of condition.

“At the age of about eight weeks the lambs are fit for the market. They then sell at high prices, which are kept up in the markets through November, December, and January.”

A breed of sheep between the Downs and Dorsetshire has been lately making considerable progress; it is very valuable, grazes well, grows to a good size, and produces a finer and heavier fleece than the pure Dorset, and averaging from three and a half to four pounds.

A small heath breed of sheep is found in the Isle of Portland, but though somewhat esteemed for its flesh, it is little cultivated, and scarcely requires express notice. It is horned, and black or mottled on the limbs and muzzle.

In Somersetshire, various breeds of sheep are kept, according to the localities upon which they thrive most advantageously; among these we may again mention the Southdowns; there are also many improved Wiltshires; Dorsets are very numerous, more particularly in the south-east parts of the county, but are by no means restricted to those districts. Devonshire Bampton, Leicesters, and others are also to be seen.

The old Somerset horned breed has been greatly crossed

by the Southdowns, and is consequently much modified; the ewes were excellent milkers, and noted for producing early lambs. A variety of this breed was once celebrated under the name of the Mendip sheep, from its inhabiting the Mendip range of hills and moorlands.

The Mendip sheep much resembled those of Exmoor; they were small, horned, and wild, with finely-flavoured flesh, and from their hardiness throve well on the moors and hills, contented with the hardest fare. Their wool was fine, but the fleece had little weight, a circumstance of no import, as it was far from being of primary consideration. Like the Dorsets and the old Somersets, these sheep were said to be capable of breeding twice in the year, and consequently their lambing time, granting that the system of breeding from them twice annually was not pursued (and its policy is very doubtful), would be regulated almost at pleasure.

At the present day, few, we may say no, genuine Mendip sheep of the old stock are to be seen. The Mendip range has become gradually more and more inclosed, and its wild tracts more limited in extent. As these changes in the surface of the land took place, parallel alterations occurred in the characters of the sheep; and not only so, but their numbers rapidly diminished. A few years sufficed for the absorption, as it were, of the Mendips into a mingled race, in which the strain of the Southdowns prevails.

The hilly district called Porlock, occupying the western extremity of the county beyond Minehead, possesses a small short-horned, wild, and active race of sheep, of which little is definitely known. It is very probable that they closely resemble the old Mendip breed.

In the vale of Taunton, and some of the richer parts of the county, Leicesters, and Devonshire Bampton, often called *Notts* or *Natts*, are kept; hence a good deal of long wool is grown in this county. In 1828 Mr. Hubbard calculated the packs of short wool at 5200 (formerly they amounted to 9400), and of long wool 5200 (formerly none).

With respect to these Devonshire Bampton sheep, we may observe, that a breed called *Notts* or *Natts* formerly prevailed in various districts, in many points resembling the Western Down sheep. They were polled, and middle woolled, but within late years their characters, from repeated crossing with the Leicesters, have undergone great alteration, and their wool has become long and fine, and the fleece greatly increased

in weight; in fact, the Bampton now take their place among the long-woolled breeds. They are good sheep, and come at an early age to maturity.

Looking at Devonshire generally, we find, as might be expected from the varying characters of the land, that it possesses several breeds of sheep. The wilds of Dartmoor and Exmoor present us with sheep in many respects not unlike the Dorsets, only that they are smaller; perhaps they are the same as the old Mendip sheep—the relics of a hill race once prevalent over the higher hill ranges of the south-western portion of our island. These sheep are generally, perhaps not always, horned; they have white faces and legs, are narrow and flat sided in the carcase, small boned, slender in the neck; when fat they average from nine to twelve pounds per quarter, and by many their flesh is esteemed excellent; some indeed compare that of the old wethers, when properly kept, to venison. But be this as it may, great quantities of this mutton, and more especially since the facilities of carriage afforded by the railroad, are sold in the London markets. It is principally from the neighbourhood of Oakhampton that the very small Dartmoor mutton is obtained.

The mountain sheep of Devonshire are extremely hardy, and many remain throughout the whole of the year, exposed to the severities of winter on their elevated heath-clad pastures. The ewes, however, are taken at the yearning time into inclosures, often on the lower grounds, where they find good pasturage; but the wethers, except in very severe winters, when they are likely to be buried by snow-storms, are left altogether at large.

Recently it has become a practice to cross the ewes with rams of the Leicester breed, and feed them on the low grounds; the half-bred lambs often become in July as large as the full-grown sheep of the original moorland breed, and at the same time lose nothing in excellence of flesh, while the fleece is materially improved both in quality and weight. This observation applies both to the Exmoor and Dartmoor sheep, which may be said to be in a transition state between their ancient condition, and rank amidst the improved and cultivated breeds of our island. The rot is little known on the pasture grounds of the forest of Dartmoor, but in the lowlands it is a common disease, especially where the meadows are wet; hence the farmer resorts much to the higher pastures even with his half-bred improved sheep, and is too apt

to expose them to the rains and mists of autumn on the bleak hills, where the old hardy breed alone could withstand the inclemency of the season.

The Southdown breed has not made much progress in Devonshire, though some farmers have succeeded in their cultivation. The food of the heath-clad moors is not congenial to them, nor are they better fitted for the humid vales. There are, however, localities on which, under proper management, the Downs would thrive, and on the folding system benefit the agriculturist.

Cornwall, we may here observe, is another county in which, owing to the introduction of the long-woolled Leicesters, the old characters of the native sheep have been almost, if not altogether, lost. Formerly the sheep of Cornwall were a small, wild, short-woolled breed, not unlike the old breeds of Dartmoor and Exmoor. Many had horns, others were polled; and many had black or dun-coloured faces; their flesh was fine, and held in high estimation. Though faulty in contour, these sheep were light, active, and agile, and fed on the downs, heaths, and sandy hills, delighting in the short grass and the aromatic plants abounding in such localities. These sheep reached maturity at about four years old, and the average weight of the quarter was about 14lbs.

These sheep are now restricted to isolated spots—they are in fact seldom to be seen in their purity. The stock has been crossed and re-crossed with the Leicesters, and a blended race, in which the characters of the latter prevail, has been the result, insomuch that the Cornish sheep are now long-woolled.

Among the principal breeds of short-woolled sheep the Ryeland must not be forgotten. This breed, once the pride of Herefordshire, received its appellation from a district of that name, in the southern part of the county, where much rye was grown, and where these sheep were bred in large numbers. It is now, however, not to be seen in its pure state; the old breed has been crossed with the Leicester, and the wool has changed its character, and instead of being short and fine, is of middle length and adapted for combing.

The genuine Ryelands were small-polled sheep, with white faces, the wool growing close around the eyes. The legs were small, the bone light, and the carcass round and compact. The fleece averaged from 1½lb. to 2½lbs.; and the weight of the wethers per quarter was from 14lbs. to 16lbs. This

breed was extremely hardy, patient of hunger, and capable of thriving on very scanty fare.

Crosses between the Southdowns and the old Ryelands were once tried, but without any advantage; and when the Merinos were in vogue, crosses were tried between them and the latter, but no permanent mixed breed appears to have been established.

Formerly great numbers of the Herefordshire breed were reared in Gloucestershire, and a valuable short-woolled breed tenanted the extensive forest of Dean. The importation of foreign short-wools, from which, at less outlay, a superior cloth could be made, led to the neglect of these sheep, or rather to their intermixture with other breeds, and no short wool is now to be obtained from that district. Still in the hills of the northern and eastern parts of Gloucestershire short-woolled sheep of Herefordshire extraction are to be seen; but in other parts of the county long-woolled Leicesters and half-bred Cotswolds prevail. The same observation applies to Monmouthshire, where formerly a native short-woolled race existed, varying in size according to the nature of the situation. The mountain sheep were small, and produced very superior mutton when fattened; the fleece was short and fine. In the more cultivated and lower districts the sheep were rather larger, and were evidently intermixed with the Ryelands.

Short-woolled sheep are still to be seen in the hilly districts, and in some parts the Southdowns are not unsuccessfully cultivated; but throughout the county generally, the long-woolled Cotswold and Leicester sheep are prevalent, and long wool is the standard growth of the county. A similar change has taken place in Worcestershire. Formerly a short-woolled sheep, with the face mottled, and as it is believed of Welsh origin, was prevalent, and many Ryelands abounded on the waste grounds; but at the present time a long-woolled race, between the Cotswolds and Leicesters, is chiefly cultivated. But in some places the breed is a mixture between the Leicester ram and the old gray-faced Shropshire ewe.

In Shropshire the Cotswolds and Leicesters have not only gained the ascendancy, but have modified the old breeds, some of which were once celebrated for the fineness of their wool. The old Shropshire sheep were horned, with black or mottled faces and legs; in stature they equalled the Southdowns, but were not so compactly made, and were longer in

the neck. They were active and hardy, and thrived on scanty pasturage. The fleece of the wethers averaged  $2\frac{1}{2}$  lbs., and the carcase weighed from 14 lbs. to 16 lbs. per quarter. Between this sheep and the Dorset a cross breed, much heavier in the carcase and also in the fleece, was cultivated by many farmers, although the mutton was of inferior quality and the fibre of the wool coarser; the increase of weight, however, both in carcase and fleece, was deemed advantageous, and a counterbalance to a somewhat depreciated rate of price per pound.

In the hilly districts a smaller variety with finer wool was found; the flesh of this breed was excellent, but the carcase seldom weighed more than 12 lbs. per quarter.

In the Clun district, formerly considered as a part of Wales, a small polled sheep with white face and legs prevailed; the fleece averaged  $2\frac{1}{2}$  lbs., and the carcase 12 or 14 lbs. per quarter.

Of the old Shropshire breeds of sheep, that of Morfe or Morfe Common was once the most celebrated, especially for the fineness of its wool, in which it scarcely if at all yielded to the Ryelands. The Morfe, situated on the left bank of the Severn below Bridgnorth, is a tract of waste land five miles in length, and from two to three in breadth, and has from ancient times been noted as a sheep-rearing district. The true Morfe sheep had small horns, and had a black or mottled face and legs; the fleece was very fine, and weighed about 2 lbs.; the weight of the wether was about 13 lbs. per quarter, of the ewe 9 lbs. When the Merinos were first introduced into England, crosses between them and this breed were expected to succeed, and Dr. Parry commenced his experiments with Morfe ewes, which however he soon exchanged for those of the pure Ryeland breed. Why the Morfe breed should not have answered Dr. Parry's expectations we cannot tell; certain it is, that at one time the wool of the Morfe Common sheep was celebrated for all those qualities in which a fine short staple ought to excel. Like all the old races of short-woolled sheep, the Morfe breed has become greatly modified; and indeed we may say the same of the old Shropshire sheep generally. On the Longmynd range small-horned sheep with dusky faces may yet be seen, and on the hills adjacent to Wales a Welsh breed exists remarkable for shortness of limb: it is polled and white-faced, and its fleece is heavy but coarse.

In the neighbourhood of the hills and commons a breed between the Southdown and Longmynd is in estimation; it is very hardy, and bites close, is of moderate size, and bears useful wool. In other parts various crosses of the Cotswold and Leicesters prevail, insomuch that the returns of wool from this county are principally of the long staple.

If we turn to the adjacent county of Staffordshire, we find the sheep to be of various characters, and crossed by breeds of almost every kind, and especially by the Leicesters; hence the native stocks have merged into others, so that few of the old pure races are now to be seen. These old races were short-woolled; one of them was known as the Cannock Heath, or Sutton Coldfield sheep; and the breed, though not in its pristine purity, may be said still to exist. It is polled, and gray, brown, or black-faced, with dusky legs, and bears a close compact fleece, inferior in quality to that of the Southdowns. The limbs are slender, the mutton is good, and the sheep fatten on a moderate supply of food, becoming ripe for the butcher at the age of three years, but may be fed to a greater weight. An improved breed of this sheep, called the Tedderley, resulted from the efforts of Sir Edward Lyttleton; its wool was of a finer quality than that of the old stock, and the weight of the carcase was superior, though the fore-quarters were light compared with the hind-quarters, which were heavy. The ewes were good breeders and nurses, and the lambs were ready for the butcher in May and June.

Crosses were afterwards made between the Tedderley stock and the Southdowns and Leicesters. Had the demand for home-grown short wool continued, the former cross would no doubt have proved most advantageous; there was an affinity between the two breeds, and the intermixture was promising; but long wool began to be alone required from the English grower. The cross, however, between the improved Cannock Heath or Tedderley breed and the Leicesters, from which much, perhaps, was expected, was not altogether successful. The weight of the carcase was increased, the wool was converted into long staple, but the sheep were delicate and unfit for their pasturage.

On the commons of West Staffordshire a light black-faced sheep was prevalent, and still exists, although considerably modified. The males were horned, and the wool was fine. Various crosses have contributed to the amelioration of this stock, without obscuring altogether its original characters;

yet these will soon disappear,—perhaps have now almost entirely become effaced,—for flocks of Leicesters are spreading over the county; and though on a few farms Sussex South-downs are reared, long-wool sheep are in the ascendancy, and long wool is the principal growth of Staffordshire.

Formerly, Cheshire reared short-woolled sheep, and the flocks fed on the heaths and commons may be still placed among the short or middle-woolled varieties. Among these the Delamere breed may be noticed; these sheep are small, have brown, black, or mottled faces and legs, and most have small horns; they weigh about 10lbs. per quarter, but the mutton is excellent, and the wool is short and very fine, the fleece seldom exceeding 1½lb.

In other parts of Cheshire are to be found sheep of all breeds and crosses; they are fed chiefly for home consumption, and purchased from the adjacent counties. Cheshire is not a sheep district; it is divided into small farms, and cheese is its staple agrarian produce. Sheep-husbandry, in the true sense of the term, is in fact little practised in this county, and the few flocks that are kept are sold off as soon as they return any profit, and seldom remain on the farm over the year.

While noticing the breeds of sheep, or rather the short-woolled breeds, peculiar to the counties bordering upon Wales, it may be as well, before proceeding northwards, to cross the boundary line (now merely imaginary) which divides England and the Principality, and take a survey of the principal races of sheep for which this latter section of our island is or has been celebrated. The Welsh sheep, generally speaking, are wild, restless, and wandering, and not easily confined in small or even moderate inclosures; for ordinary fences or hedges are seldom capable of restraining them, nor do they submit, like tamer sheep, to the discipline or management of the shepherd. Some of these sheep are horned, others are hornless. They vary too in colour, from white to dingy brown or gray, and black individuals are not unfrequent. They are active, vigorous, and sure-footed, and clamber among the mountain rocks with the utmost address. Their wool is short, but varying in the quality and weight of the fleece, according to breed or pasturage.

Turning first to Glamorganshire, a maritime county of South Wales, it may be observed, that this county is covered with mountains, some of which branch off from the principal



Welsh Sheep, p. 28.

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range that extends east and west through Brecknockshire into Caermarthenshire. The centre of the county is occupied by a group of mountains branching off in every direction except the north, and having its chief extension from east to west, from the valley of Cynon to that of the Neath. On the south of this range the country is fertile and well adapted for horned cattle; but on the north the hills yield a coarse and scanty pasturage, well fitted for the hardy breed of sheep which, time immemorial, have occupied this tract and the adjacent districts. The native sheep are remarkable for a small head and a long, erect, and somewhat deer-like neck; the fore quarters are light and the breast and shoulders narrow, as are also the back and loins; the legs are long and small-boned; the head sometimes horned, sometimes polled, and the colour variable. These sheep are active, unquiet, and restless. Their fleece averages 2lbs., and the quality of the wool is good. Many flocks, however, have the wool deteriorated by the number of kemps or hairs which grow amongst it. The sheep are regularly shorn in May or June; but in many places the newly grown wool is clipped close about the neck and fore-quarters at Michaelmas, a practice the more excusable, as this wool would be all torn away during the autumn, winter, and spring, in consequence of the animals forcing their way through briars, rough thickets, and masses of furze, in search of food.

Many farmers shear the lambs in the first summer,—a practice by no means to be commended, inasmuch as they require a warm coat to serve as a protection against the chilly breezes of autumn and the severities of winter. It is true that the thorns of the thickets and briars may make the coat somewhat ragged; but this is of little consequence in comparison with their comfort and health; besides which, tegg or hogget wool is more valuable than that of the lamb. We believe that this plan of lamb shearing is greatly on the decline, and abandoned by the best farmers. Another plan, now almost if not quite obsolete, is that of weaning the lambs at an early age, for the sake of the milk of the ewes. It was once a general custom to milk the ewes morning and evening, from the middle of May to September; but this unwise practice is becoming extinct, and is only adhered to by those who pertinaciously cling to old habits, regardless of the dictates of reason, and swayed by prejudice.

It must not be supposed that no attempts have been made

towards the improvement of the Welsh sheep, nor that these attempts have not been more or less successful, especially in the vales and lower grounds, where the sheep exceeded in size those of the hills, and produced a heavier fleece. In due time the practice of turnip husbandry began to be introduced, enabling the farmer not only to keep more sheep, but sheep of a heavier breed, and to fatten them more expeditiously. It was then that the vale sheep began to be crossed with Leicesters and hardier though larger Cotswolds, till at length these breeds in most parts of the vale of Glamorgan acquired the ascendancy; so that now, instead of the native race, Cotswolds and Leicesters mingling in various proportions are almost exclusively to be seen there.

In some parts crosses with the Southdowns have answered well; nor have the Cheviots been unsuccessfully cultivated. They require to be brought from the hills to the low lands in winter, and defended from the rigours of the season. By care and good management they may be made to answer, but they will never supersede the mountain sheep of Wales in its own stronghold.

These mountain sheep abound in the high lands of Brecknockshire, and are the chief dependance of the hill farmer. From the dryness of the soil, and from better and finer herbage, these sheep are superior to those of Glamorganshire, and yield better wool. The ewes are brought down from the hills in winter, and not taken back till the cold weather has ceased, and the lambs are strong enough to bear exposure. In this county, within the last fifty years, agriculture has greatly improved. More manure is put upon the fertile lands, cropping is better understood, and turnips generally cultivated. The same observations apply to Caermarthenshire also, in the valleys of which Cotswold and Leicester sheep, but particularly the former, are now naturalised, while the original mountain sheep retain possession of the hilly tracts. We may, in fact, say the same as regards the counties of South Wales generally. Wherever a spirit of improvement manifests itself, we find in the inclosed vale-farms sheep of different breeds and various crosses, more or less valuable; but the mountains are tenanted by the old Welsh breed, varying in minor particulars, according to the care bestowed upon the flocks during winter, and the sufficiency of the pasturage.

In Denbighshire and Flintshire the sheep are of various

breeds, and not very numerous; as elsewhere, a small race prevails on the hills, but in other parts English sheep of various crosses and various qualities are cultivated. In Merionethshire, a mountainous district, sheep-farming is the staple business of the agriculturist, and the breed of sheep is celebrated. Those sheep of pure strain are of small size, with light bone, and their mutton is pre-eminent. The weight rarely exceeds 10lbs. per quarter, and the fleece averages 1½lbs., but its quality is good, and it is largely used in the manufacture of Welsh flannel. The sheep of the best race and purest strain are supposed to be those bred at the base of Cader Idris, and the rams from that quarter are in general request.

It is the practice in this county to clip the sheep twice in the year, from a very mistaken idea that finer wool is thus procured.

Passing from Merionethshire to Caernarvonshire, we still find the mountains covered with sheep, many of which are horned. These sheep are small, averaging 9lbs. or 10lbs. per quarter; but in the lower grounds, and towards the Straits of Menai, they are somewhat larger, and average from 14lbs. to 16lbs. per quarter. These sheep, like those of Merionethshire, bear the impress of a semi-wild race, and throughout the whole year range the mountains, feeding upon the short pasturage. In some districts, however, they are driven to lower grounds during the winter, or are depastured on home sheep-walks, and many farmers hire winter pasture for the yearlings. Hardy must the flocks be, which are exposed on the hills to the severities of the winter storms. Little or no provision is made for them, nor is any protection afforded them by smearing, either in this county or in other parts of Wales generally. Yet on the produce of these sheep do the hill farmers chiefly, if not wholly, depend.

Crossing the Straits of Menai into the Isle of Anglesey we find several breeds, some original, some crossed, and of course varying in size and qualities.

The old breed of Anglesey was generally hornless, black or dun-faced or mottled, long in the neck, high in the legs, long in the carcase, and narrow in the loin: the wool fine, and of medium length. This breed, now improved, averages from 16lbs. to 18lbs. per quarter, taking the wether at two or three years old. Besides this breed, which in some

respects approximates to the Southdown, a white-faced variety is occasionally to be seen, but is most probably the result of some early cross.

Passing from North Wales into the more northern counties of England, we find various breeds of heath sheep depasturing on the hilly tracts of country, not, however, unmixed with sheep of many other races and intermixtures. Of these, Leicesters, Southdowns, Herefords, Cotswolds, and Cheviots may all be seen. Lancashire is a great manufacturing county, and sheep husbandry is not its *forte*; yet, in some of the hilly parts, towards Yorkshire, an original horned breed, termed the Woodland sheep, is still to be found, and this stock extends even into Scotland; not that it is kept as a pure breed in all places: on the contrary, it is variably crossed, and thereby much modified, according to the suitability of the pasturage and the views of the farmer. For this purpose, Southdowns on the one hand, and long-woolled Leicesters on the other, have been put into the field, to the increase, in both instances, in the weight of the carcase in the cross-strain, and in that of the latter, to the augmentation of the weight and value of the wool.

On the borders of Lancashire, adjoining the county of Westmorland, a horned breed of sheep with white legs and faces is prevalent. This is known as the Silverdale breed, and is peculiar to tracts of rocky limestone. The wool is of moderate length, and good quality, and the sheep ripens early, and affords excellent mutton.

In Westmorland, the mountains and barren wilds are tenanted by sheep similar to those of the hilly parts of Lancashire; but in the lower grounds and good pastures, mixed races of long-woolled sheep prevail. The same remarks apply to Cumberland, on the mountains of which a rough-legged breed, with a thin meagre carcase and coarse hairy wool, is still common, although in some parts it is now improved, and especially by a cross with what is called the Herdwick breed.

This breed is noted for its hardiness, a better wool than that of the old race, and the superiority of the mutton. The wethers are in their prime at three or four years old, and are said to be in prime season from June to September, when the aromatic heath plants are in bloom, the flesh acquiring at this time the richest flavour. The weight of the carcase is from 10lbs. to 12lbs. per quarter.

The ewes are kept as long as they will breed,—often till twelve or fifteen years of age. The lambing season is in May. In the rearing and management of the lambs the shepherd has little trouble. They are well defended by wool, and are active and hardy.

In the low and fertile lands many flocks of Leicesters are now established, and a considerable quantity of long wool is grown, but to what precise amount we have no data for ascertaining. Mr. Luccock estimated the number of packs of short wool at 5915, averaging each fleece at  $3\frac{1}{2}$  lbs.

In Northumberland great changes have of late years taken place in sheep husbandry. This county, indeed, stands pre-eminent for scientific farming, for an improved mode in the cultivation of turnips, and for the rearing and fattening of cattle. Turnips occupy a large portion of almost every farm. They are not sown broad-cast, but by drilling on narrow flat-topped ridges into which the fields are laid by means of the plough and a roller, having been previously well manured. By this system abundance of food is secured for sheep, of which the improved Leicesters are extensively cultivated, and in some places Southdowns, together with other breeds of excellence.

But besides these the mountain districts have their own races. In the west of Northumberland the black-faced horned mountain race, which extends over Scotland, chiefly prevails; but the Cheviot hills, which, notwithstanding their elevation and their conical peaks, are covered, excepting in boggy parts, with a fine green turf, affording excellent pasturage for sheep, are the original nursery of a peculiar breed called the *Cheviot*, which in Scotland contests for superiority with the black-faced.

On the Cheviot range this breed has existed from time immemorial, but has lately been improved, principally by a system of crossing with the Leicesters, not so much as respects the wool, but the weight and contour of the carcass.

The Cheviot breed is hornless, the face and legs in general white. The best kinds have a fine open countenance, with lively prominent eyes. The body is long, the fore-quarter wanting in depth in the breast, and breadth both there and on the chine. The legs are fine, clear, and small-boned; the pelt thin; weight of carcass when fat from 12 lbs. to 18 lbs. per quarter; fleece from  $2\frac{1}{2}$  lbs. to  $3\frac{1}{2}$  lbs. The

wool is not all fine, there being only 2lbs. of fine wool and 1lb. of coarse wool in a fleece weighing 3lbs.

With respect to the black-faced or short sheep, as they are termed, in contradistinction to the Cheviots, a few observations may be here made, in order to point out their chief characters. These sheep are active, vigorous, and hardy; the males have large heavy spiral horns, and the countenance has a wild and bold expression. The wool is open, coarse, shaggy, and rather long; it covers the forehead between the roots of the horns and the sides and base of the lower jaw. The face and limbs are black.

By care and skill in breeding, this sheep is much improved to what it was. The general form is good, the carcass is short, round, and firm, the limbs of moderate bone, firm set, and clear; the system is capable of enduring the severities of a northern winter on the mountains; and the mutton is celebrated for its excellence. Indeed, these sheep have, since the establishment of steam vessels and railroads, been sent from the north in considerable numbers to the London markets, where they sell well, the fineness of the grain of the meat, and the delicacy of its flavour, being duly appreciated. Although, as we have said, this breed is common on the mountains of Westmorland, Cumberland, and many parts of Northumberland, Scotland appears to be its stronghold, where it contests for predominance with the Cheviots.

Descending from Northumberland into Durham, we find the moorlands occupied by the black-faced sheep, but in all the lower and cultivated parts of the county long-woolled sheep have become established. Among these, the Leicesters are prevalent, insomuch that good long wool may be regarded, as far as sheep are concerned, the staple growth of Durham. Formerly, a very large breed, which bore a heavy fleece, occupied the south-eastern parts of this county. The wethers often weighed from 50lbs. to 60lbs. the quarter; but they were late in ripening, and are now superseded by the more profitable Leicesters of the improved race, or have merged into the latter by repeated crossings.

In the adjacent county of Yorkshire, the old Teeswater and long-woolled breed (but now intermixed with the Leicesters) long predominated along the banks of the Tees and the Humber, in the North and East Riding, and, greatly improved, have now established themselves in every part of the county. Nevertheless, on the hilly grounds and moorlands,

different breeds of short-woolled sheep will ever maintain their ground. The wild bleak moorlands of the North Riding are tenanted exclusively by a short-woolled race, which depasture all the year round on the dreary open heaths, contented with the coarsest fare. These moorlands are intersected by sheltered valleys, which for the most part are well cultivated and fertile; but except perhaps in the depth of winter, the flocks are not driven there for shelter. The original breed on these moorlands is of small size, with coarse hairy wool, black or mottled legs and face, wide-spread curling horns, and fine-boned limbs. The wethers averaged from 10lbs. to 14lbs. per quarter; the ewes much less. This small, hardy, active breed is now much improved, owing to judicious crossings; still it retains much of its original character. It appears to be closely allied to the horned black-faced Norfolk breed of the olden time, and is, we suspect, a mere variety of the northern black-faced race to which we have previously alluded. This latter race is also to be found in many parts of the Yorkshire moorlands. Southdowns have in some places established themselves, or formed a mixed breed; and in other places flocks of Cheviots are to be seen. In the hilly parts of the East Riding a coarse-woolled small sheep, with black face and limbs, but destitute of horns, still lingers.

In the West Riding a peculiar breed of sheep, called the Penistone (from a town of that name between Sheffield and Huddersfield), has existed from remote times, and a similar breed is found in Craven. This breed is horned, and has spotted legs and face. The wool is of moderate quality, and the wethers average 15lbs. or 16lbs. the quarter. In the north, this breed has been crossed with the mountain black-faced race, but without any advantage. In the more southern parts, the Leicesters, the Cheviots, and the Ryelands have been resorted to, and with decided success, particularly in the case of the last two breeds.

The usual yeaning time in the moorlands does not occur till the month of May, when the snows have melted away and the weather is open. The consequence is, that the farmer loses very few lambs comparatively, and may congratulate himself on his prudent management.

Looking at the extensive county of Yorkshire as a whole, we cannot shut our eyes to the fact that, wherever the pasturage will bear them, the long-woolled breeds of sheep have made rapid progress. In the year 1800, for example, the

packs of short wool amounted to 19,000, those of long wool to 3200. In 1828 the packs of short wool, according to Mr. Hubbard's calculation, amounted only to 5708, while those of long wool had increased to 17,224. Such are the changes which have taken place in the predominance of certain breeds of sheep, and in the modification of all.

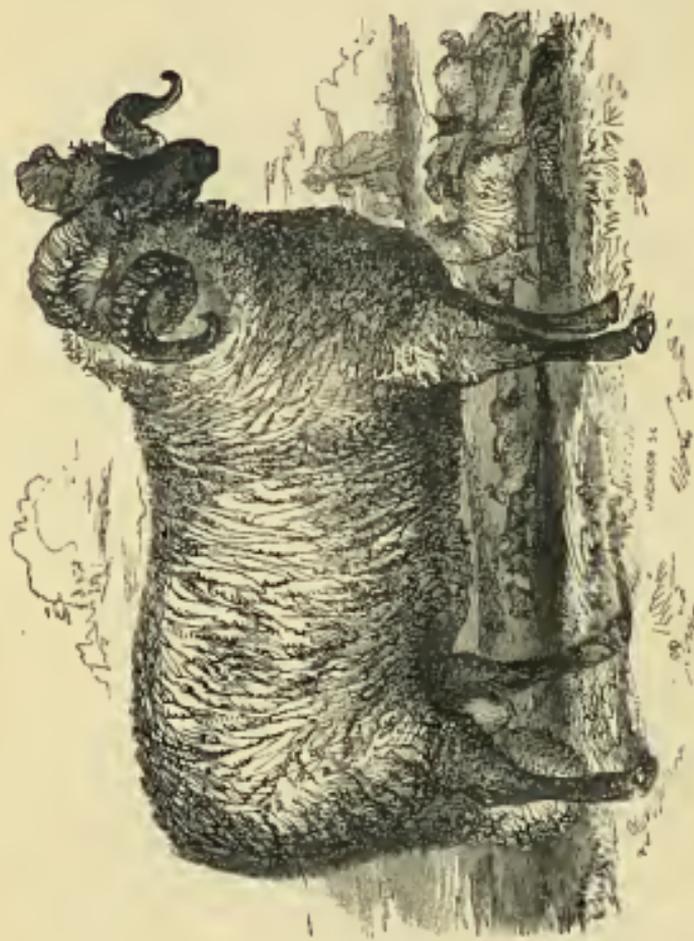
We may in a great measure apply the same observations to the sheep of Derbyshire, which we have done to those of Yorkshire. Formerly, a short-woolled sheep was prevalent generally, but now in all the fertile parts long-woolled breeds have become established. In the high moorlands of the Peak, however, a wild, black-faced, small mountain breed still maintains its ground. These sheep have large curling horns, and wool of moderate quality, but belonging to the short kind, often close, soft, and excellent for felting, sometimes even fine. In less rude and exposed situations, a polled sheep with a coarse and hairy fleece was to be seen; but this breed has been greatly improved by intermixture with the Leicesters, and is now really valuable. The sheep has not lost its activity, but its wool is decidedly ameliorated, and it has acquired a greater weight of carcase. The mutton is of first-rate quality, especially when fed on the gritstone districts. The ewes year early, and the lambs are excellent.

In the lowland and more fertile parts of Derbyshire, the long-woolled sheep have been rapidly on the increase, and are now predominant.

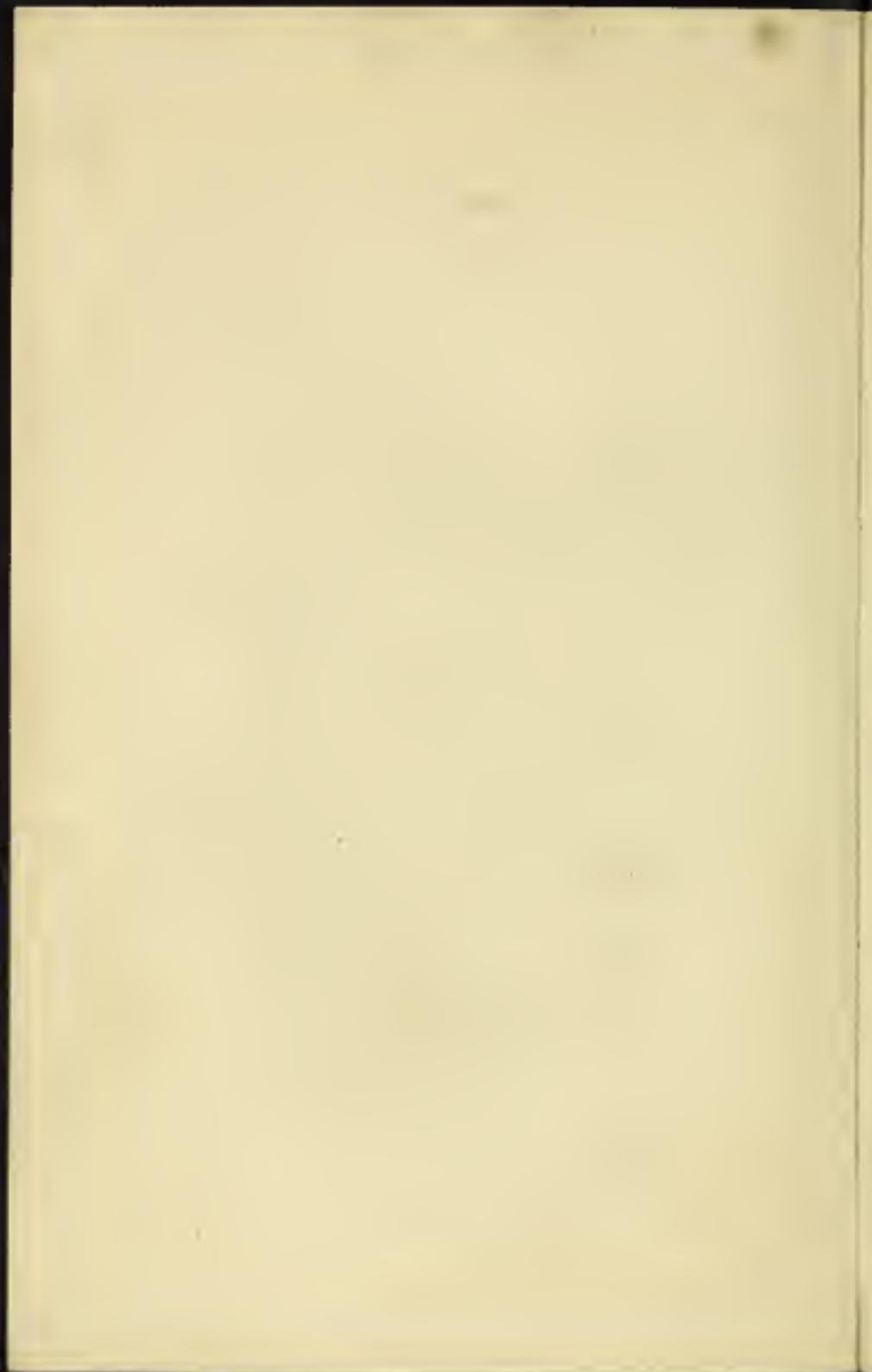
Nottinghamshire was once noted for small breeds of short-woolled sheep; of these one was horned, with black legs and face, and having a fleece of fine short clothing wool; this breed was chiefly peculiar to the sand district west of the Trent. In the forest of Sherwood a distinct breed existed; it was polled, with the face and legs gray, and it yielded a small fleece, scarcely exceeding a pound in weight, of very fine clothing wool. Of these breeds few traces are now to be found. In some districts flocks of Southdowns are to be seen, but long wool is now the chief produce of this county.

In Lincolnshire generally, the improved Leicester breed prevails; although in the northern and western districts many flocks of pure Southdowns are kept. Formerly, a coarse-woolled sheep was common, having the staple of the fleece of moderate length; but it has merged into the Leicester breed, or altogether passed away.

In the counties of Norfolk and Suffolk, a peculiar variety



Old Norfolk Ram, p. 36.



of heath sheep has existed from remote times, although it is now seldom if ever to be seen in its purity. This breed was horned; the horns of the males were large and spirally twisted, those of the ewes and wethers small; the legs and face were black, the latter was long, with a flat chaffron; the aspect was wild and animated; the fleece was of inconsiderable weight, but consisted of fine short wool. With respect to contour, the shoulders were low, the fore-quarters deficient compared with the hind-quarters, and the loin was inclined to be narrow. These sheep fattened early, and produced excellent mutton, and thrived on coarse and scanty pasturage. They were very hardy, and bore the fatigue of daily travel to and from a distant fold without inconvenience; from these circumstances, and from its utility as a folding sheep on sterile land (thereby converting it into good arable land), the old Norfolk sheep was a great favourite with the farmers, by whom it was much improved. The butcher also found this sheep profitable; in proportion to its weight it carried much loose fat, and, it is asserted, more kidney fat than any other breed whatever. Long did this really valuable breed maintain itself against all rivals; but it was ultimately destined to succumb before the still more valuable Southdowns. On the first introduction of these latter, crosses between them and the Norfolks were tried, but without any decided advantage, and gradually the star of the Southdowns rose in the ascendancy.

It is true that the Norfolks were as good folding sheep as the Southdowns,—would bear journeys as well, or better,—and would thrive in coarse pastures where the Southdowns would refuse to feed. But on the other hand, the Southdowns were found to be far more tractable and contented than the restless Norfolks; they endured, without suffering, any inclemency of the weather; they consumed a smaller quantity of food in proportion to their size, and gained from that food a far superior weight; nor did they wander about, destroying by the trampling of their feet as much food as they ate, but settled quietly down in their pasturage, as if well satisfied and happy. Besides, they yielded a far greater weight of fleece, more readily disposable in the market, and that, too, at a higher price. The ewes yeaned more lambs, taking the flock together, and were better and more attentive nurses.

Thus the Southdowns became dominant. In the meantime, various crosses took place between the Norfolks and

other breeds, and even the pure Norfolks began rapidly to improve, both in aptitude to fatten, in weight of carcase, and that also of the fleece. In fact, agriculture had begun, in every department, to make great progress in Norfolk, and is now carried to a high state of perfection; there is, consequently, better and more abundant food for sheep, which, independent of their value in other respects, benefit the land by their manure. It is generally the practice, after the summer and autumnal pastures and seed and meadow grass mowings are consumed, to feed both breeding and fattening sheep, and also young store sheep and lambs, upon turnips, meadow and seed hay, and winter tares. The Norfolk farmers and graziers are more partial to turnips (Swedes and others) than to any other sort of green winter food. About an acre is generally allowed to every ten fattening wethers, or twelve breeding ewes; and when these do not perfectly consume their allowance, they are followed by the tegs, or previous year's lambs. These soon clear up all that was left, and contribute to the improvement of the soil. Owing to the improved system of agriculture, more sheep are kept on the cultivated lands than formerly, and each sheep is heavier both in fleece and carcase. Numbers are also fed on the marsh lands, and also on tracts which thirty or forty years ago would scarcely afford food.

We must not suppose that there are no long-woolled sheep in Norfolk—quite the contrary; and of late years their number has been on the increase, insomuch that the packs of long wool a few years since were estimated by Mr. Hubbard at 8550, and those of the short wool at only 4300. This statement differs from that of Mr. Luccock, who calculates the packs of short wool at 5700, and of long wool at 1120. The probability is, that the quantity of long wool is on the increase, while that of the short wool remains stationary; for, within the last twenty-five years the whole quantity of wool produced in Norfolk has doubled. We need not say that none is available for fine broad-cloths; but it is made up into flannels, and also, when mixed with foreign wool, into low or inferior cloths. The Norfolk wool finds its chief markets in Yorkshire and Lancashire.

With respect to Suffolk, although there are now more long-woolled sheep, Leicesters, and cross-breeds, than formerly, still the principal flocks are Southdowns, which yield upwards of 8000 packs of wool. It is a great object with the Suffolk

farmer to rear early lambs for the butcher, and for this purpose he finds the Southdowns, or a breed between the Southdowns and Norfolk, most advantageous. As soon as these are fattened, they are sold off at Ipswich fair, the farmer purchasing fresh breeding stock. It is calculated that about 100,000 sheep and lambs are every year exposed there for sale.

Passing from Suffolk to Essex, we find various breeds of sheep kept chiefly for the supply of the London markets; Southdowns and cross-bred Norfolks are the favourites. Formerly, a small breed of sheep was to be found on the commons of this county, while in other parts a sheep yielding a long, coarse fleece averaging about 4lbs in weight, was general. But these breeds are not now to be seen.

With respect to Leicestershire, Rutlandshire, Warwickshire, Northamptonshire, Cambridgeshire, Bedfordshire, Hertfordshire, and Middlesex, little need here be said. Middlesex is not a true breeding county; but the sheep it contains are mostly of the short-woolled stock. Hertfordshire is a halting and grazing district for flocks destined for the London market, and these are of all kinds. In many parts, however, and especially about Rickmansworth, house lambs are reared for the metropolis.

From Leicestershire the long-woolled race has radiated, spreading over the midland and south midland counties generally, superseding almost every other breed excepting the Southdowns, and in Cambridgeshire, crosses between the Norfolks and Southdowns, or between the latter and the Leicesters. In Bedfordshire, the Southdowns are established on the southern tract of chalky hills, but elsewhere the Leicesters predominate. In Buckinghamshire, the sheep on the Chiltern hills are of the short-woolled strain—Dorsets, Wiltshires, and Southdowns; but in other parts the Leicesters and Gloucesters have gained ground, and long wool of excellent quality is grown on the banks of the Ouse and the Vale of Aylesbury. Buckinghamshire is one of the counties in which lambs and sheep are fattened for the London markets; many ewes are kept for the sake of early lambs, the Dorsets being preferred for this purpose, and the Southdowns for mutton. On the Chiltern hills it is the usual practice to buy two-thirds of wethers, and one-third of ewes in autumn; the wethers are fattened on turnips, and the ewes, after the lambs are sold off, are themselves fattened on grass the next summer.

In Huntingdonshire, few sheep except the Leicesters are to be seen, and long wool may be said to be grown exclusively.

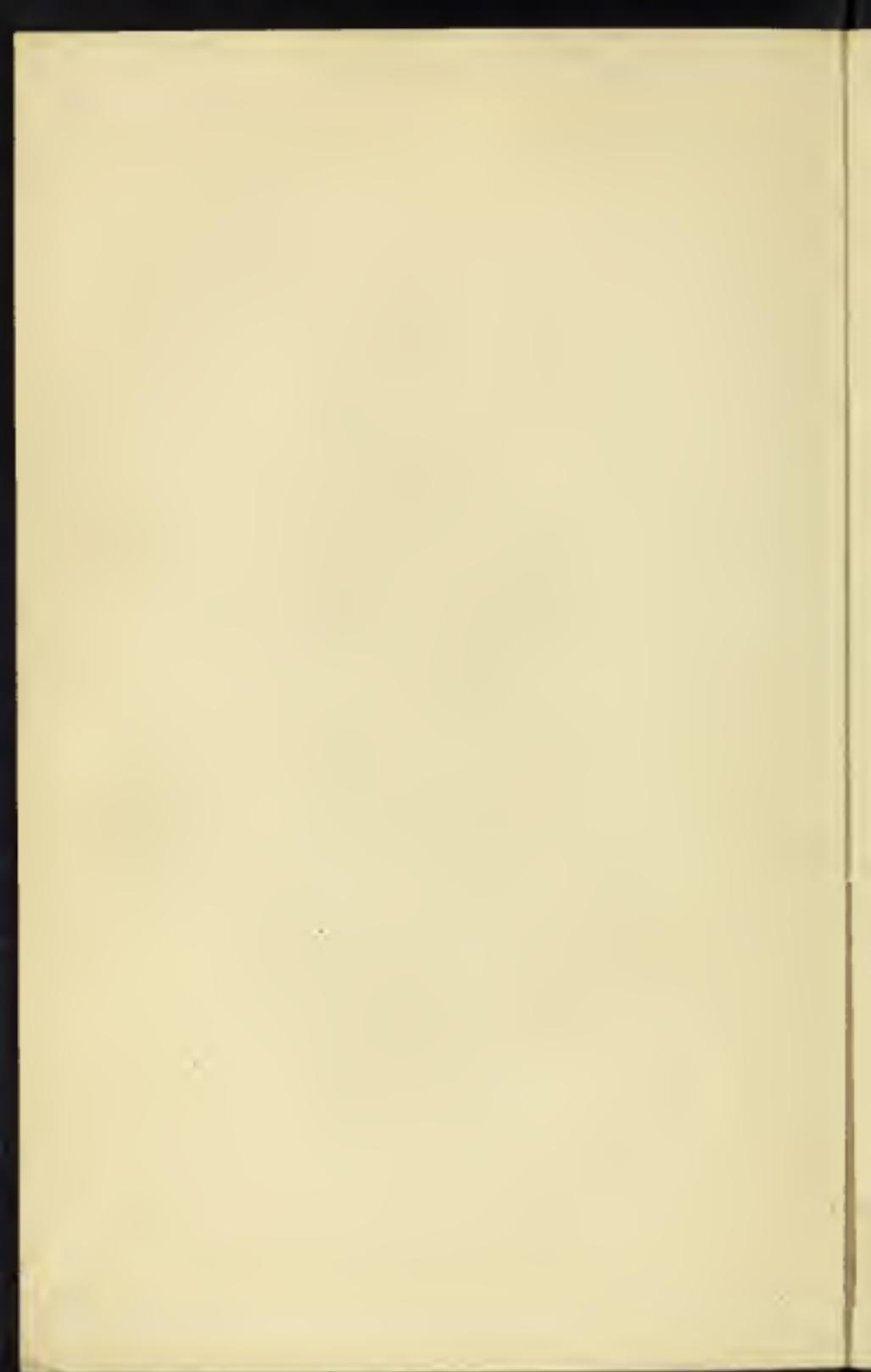
We shall not expatiate on the changes and crosses to which the breeds of sheep are subject in the counties just enumerated; and with respect to the long-woolled races we shall hereafter proceed to notice them more particularly. But before quitting this part of our subject, we must revert to Scotland, which, in our cursory survey of the Cheviots and the black-faced mountain sheep, we stated to possess both these breeds as rivals for predominance. We need not recapitulate their respective characters: both breeds are adapted for a mountain home.

Lanarkshire is the great nursery, so far as Scotland is concerned, of the black-faced horned sheep, and they extend their range throughout the Grampians and their offsets, from their most southern to their most northern limits. In Lanarkshire the standing stock of these sheep has been estimated at upwards of 120,000, of which a great proportion are breeding ewes, the wether lambs being sold to the farmers of the mountain districts. The ewes generally produce the first lamb when at the age of two years; some, however, at an earlier age, before the constitution is sufficiently matured.

In most places these sheep have little protection against the severity of the winter season; but as Lanarkshire is a breeding county, some degree of care is taken of the flocks, as extensive losses would be a serious evil. Circular open stalls or pounds, consisting of a wall five or six feet high, are built on the moorlands and pastures, to serve as a partial protection against the driving tempest, and in some places the stall is surrounded by fir trees. To these stalls the sheep retreat for shelter in cases of emergency, but are never fastened up. They wander forth at will, searching for food, and it is only when the snow covers the grass too deeply for them to get at it, that they are supplied with hay or other provisions. In some parts the sheep are pastured in the lower districts during the depth of winter; but this plan entails additional expense, inasmuch as the farmer has to pay for their pasturage at the rate of 1s. 6d. per head, and this, beyond the ordinary expenses of shepherds, of materials for smearing, and the payment of rent, effects a great reduction on the farmer's profit, more especially when the losses by disease, accidents, and the severity of the weather are taken into the account.



Black-Faced Scottish Sheep, p. 40.



The mountain sheep farmer's profits, as must be evident, are precarious. He depends greatly on his clip of wool. This may fall short (from losses); and besides, the demand for coarse wools is liable to fluctuation.

The improvement of the black-faced sheep has not arisen from any crosses, for none of these have fairly succeeded, but from careful and judicious selection. The best wethers, when fattened, average about 16lbs. per quarter, but when forced beyond a natural size, as is sometimes done for the sake of show at some of the agricultural meetings, the flesh loses its fineness of grain and its peculiar delicacy of flavour. In all sheep this is the case. Mutton grossly overloaded with fat is neither wholesome nor of good quality; and this deterioration is the more perceptible in breeds of noted excellence for the goodness of their flesh. There is a proper point in fattening sheep, not only as it respects profit, but the quality of the meat, at which to stop. Let it not, however, be supposed that we recommend lean, ill-fed mutton, for such is not our meaning.

As numbers of sheep are kept on the pasture lands and mountains of Scotland, requiring daily care and watching, and that, too, in a wild, bleak country, the office of a shepherd becomes one of importance, and the value of a good and experienced shepherd is always acknowledged.

With respect to the islands of Scotland little need be said. In Arran, Islay, and Jura, the black-faced sheep principally prevail; in the former island a small breed with dun faces and legs long maintained its ground, and indeed still exists, and is celebrated for the excellence of the mutton.

The native breed in the Hebrides is of small size, and horned. The general colour is white; many altogether black or brown are to be seen. Within the last few years, the black-faced breed has been introduced, and may be said to thrive well. In the Hebrides almost all the articles of clothing composed of wool are manufactured in the peasant's cottage. As may be supposed, these home-made fabrics are rude and coarse; but at the same time they are warm and durable, and well suited to the climate.

Numbers of sheep are kept in the Orkney Islands, where they wander during the greater part of the year in a state of liberty, and may be said to be almost utterly neglected. Nevertheless, they produce a fine wool, but their flesh, in consequence of their habit of feeding on sea-weeds during the

ebb of the tide, is said by Mr. Low (*Fauna Orcadensis*) to be in general very indifferent. According to the same authority, the flocks are *rowed*, and not shorn. This operation takes place at Midsummer, when the wool is naturally loose; on a given day, the men of the parish assemble with their dogs, and by dint of exertion drive the flock into pens or inclosures, from which they are removed, each in its turn, in order to undergo the operation of having the wool plucked from the skin; after which the animals are turned loose to shift for themselves until the next *rowing* season. Should severe weather come on at this juncture, many perish.

It has, indeed, been asserted that this operation gives no pain, inasmuch as the wool is at that time beginning to separate from the skin, and if not thus obtained would become disengaged and lost, and that, consequently, the cruelty is only in appearance. We doubt whether the men pay much attention to the precise time in which the *rowing* could be effected without giving pain; and Mr. Low expressly says, that it "brings the whole blood to the skin," leading us to conclude that it produces considerable suffering.

Considerably north of the Orkneys are situated the dreary Shetland Isles, with their towering cliffs and bold headlands frowning over a dark and stormy sea. Formerly, these islands were tenanted by the descendants of Norwegian and Danish colonizers, and formed part of the territory of the monarch of Norway and Denmark; and it is supposed, and with good reason, that the sheep, long celebrated for the fineness of their wool, were originally of Danish extraction, and imported by the early settlers. These sheep are very small, with or without horns, wild, active, watchful, and hardy. The carcase seldom weighs more than 8 or 9lbs. per quarter. The wool, which is exquisitely fine, is sometimes of a lustrous white; but in other sheep, regarded by some as a cross breed or a distinct breed, it is dun, brown, or black, and of a cottony texture.

Although the pure Shetland breed has been crossed by others of larger size, to the deterioration of the wool and the marked diminution of hardiness, still, in the more exposed and desolate parts the original breed remains in its purity, and leads a life of uncontrolled freedom. On the small uninhabited islands, or *holmes*, as they are called, these sheep find a congenial abode, and multiply unprotected by man, enduring the blasts of a northern winter.

The best wool of the Shetland sheep is peculiar in its quality; for stockings, gloves, and light fabrics, as fine shawls, and other delicate tissues, it appears to be admirably adapted; and by judicious cultivation it is doubtless susceptible of improvement, not by crossings with other sheep, but by perseverance and judicious selections of the breeding stock from the best of the best flocks.

When the rowing of these sheep is finished, they are turned loose again. In a short time the wool begins to grow, and when it has gained a moderate degree of length, the hair in its turn begins to fall off; so that, after rowing, hair is the only coating, and afterwards, during the brief summer, wool. But as the autumn advances, the hair is rapidly renewed, the wool lengthens, and by the setting in of winter the sheep is clad with an outer coat of long hair, and an under coat of deep fine wool; thus defended, it is enabled to endure the rigour of the winter, even in its bleak and dreary abode.

#### THE LONG-WOOLLED SHEEP.

Under this head range the old and new Leicesters, the Teeswaters, the Lincolns, the Cotswolds, the Romney Marsh, and some other breeds of sheep for which our island is noted. From the earliest times it contained long-woolled sheep, and this breed has never lost its distinguishing features. Its origin is lost in remote antiquity. Where it now reigns predominant, there it has existed time immemorial. It claims the green swards and luxuriant pastures of our midland counties as its peculiar province, not perhaps its exclusive province, but as its "*dilecta sedes*."

Of these breeds the Leicestershire strain, from its importance and the part it has taken in modifying not only the allied long woolled races, but some also of the short-woolled stocks, first demands our notice.

Mr. George Culley, in his excellent *Observations on Live Stock*, evidently gives more credit to Mr. Bakewell for his improvements in the old Leicester breed of sheep than in the long-horned breed of cattle; in both instances, indeed, this great agriculturist produced the most important alterations; nevertheless, the effects of his skill and industry as respects the latter have proved evanescent. The dynasty of the long horns has passed; but the Dishley breed of sheep, established by him, still retain their pristine qualities, and are unrivalled in their own country or in the world.

It was about the middle of the last century that Mr. Bakewell, of Dishley in Leicestershire, first applied himself to the improvement of the old Leicesters. This old breed had many good points, yet it had its defects, and these of no trifling character; it was large, heavy, and coarse-grained, the mutton having little flavour, and no delicacy; it was long in the carcase, flat-sided, large-boned, and clumsy; the ewes weighed 18 or 20lbs. the quarter, the wethers from 20 to 30lbs. The wool measured from 10 to 15 inches in the length of the staple, and was variable as to quality, but generally coarse. These sheep were slow feeders, and returned little profit.

Such was the stock, common to Leicestershire and the adjacent counties, on which Mr. Bakewell began his course of experiments; in the prosecution of which he violated all the old axioms of his day, and proceeded upon principles totally at variance with those by which the breeders had previously regulated their practice. They aimed at size, irrespective of symmetry and aptitude to fatten; and at heavy fleeces, considering weight of wool as of primary importance. Mr. Bakewell, on the contrary, regarded symmetry and aptitude to fatten as first-rate qualities; he found these to be inherent in small, not in large heavy-boned sheep, which latter consumed an extravagant abundance of food without returning an adequate profit; whereas the smaller sheep he found to increase more rapidly in weight, proportionately, even upon a less consumption of diet. His experience had also taught him another point, viz., that sheep carrying a heavy fleece had always less aptitude to fatten, and were far slower in ripening, than those whose fleece was moderate; and he considered symmetry and early ripening to be of more importance than the loss of a few pounds in the fleece. In short, he considered that the value of the carcase was the first object to be attended to in breeding of sheep; and he looked upon the fleece as of secondary importance—not that the loss of two or three pounds in the fleece was not an object, but still he thought that if to preserve this the farmer not only lost ten or twelve pounds of mutton by it, but had to feed his sheep for twelve or eighteen months longer than he ought, he would pay dearly for his three pounds of wool extra. Mr. Bakewell was right; and on these principles he addressed himself to his task.

The improved Leicesters are not adapted for a scanty pas-

turage, over which the sheep must travel all day in order to procure a sufficiency of food. They require a good, or at least moderate soil, and on this they fatten with incredible rapidity, and are consequently very profitable to the breeder. If in the establishment of this breed Mr. Bakewell erred, it was in the very little regard he paid to the wool, in which his immediate followers imitated him, some even going so far as to prefer sheep with bad fleeces to those with good, as if a fine and perfect carcase and good wool were incompatible with each other. But this false notion is now corrected, and the fleece obtains its due share of attention.

With respect to the quality of the mutton of the improved Leicesters, we do not estimate it so highly as that of some of the short-woolled breeds. When not over fat, it is tender and juicy, but destitute of high flavour; but when fattened to a high degree, the interstices of the fibres of the muscles are replete with fat in such a manner that the line of distinction between fat and lean is almost, as it were, lost; the carcase appears to be a mass of fat, and is anything but attractive. Besides, such meat is not profitable to the purchaser, though it may be to the cook. We admit, however, that it is the grazier's fault if he carries the fattening process beyond the point at which he ought to stop, whether he regards his own profit or the interest of the consumer. It is the character of the breed to ripen early and quickly. As soon as the sheep are in a proper condition for the butcher, the grazier, instead of wasting more food upon them, should get rid of them, and commence the feeding of another lot, to be disposed of in their turn as soon as ready.

It is for the accumulation of outside fat that the Leicesters are chiefly remarkable. They have comparatively little loose inside fat or tallow—a point of some consequence to the butcher, who deems this as adding to his profit. By way of a counterbalance, however, the smallness of the head, the thinness of the pelt, and the general greater weight of the carcase than the appearance of the animal would indicate, should be taken into consideration. Whatever it may be to the butcher, “this diminution of offal is advantageous to the grazier; for it shows a disposition to form fat outwardly, and is uniformly accompanied by a tendency to quickness of improvement.” In this latter quality the new Leicesters, *cæteris paribus*, are unrivalled.

The new Leicesters, with all their good qualities, are not a

hardy race, neither are they so prolific as many other breeds. The ewes seldom produce twins, nor indeed did the founders of this stock deem the production of twins desirable. They aimed at bringing forward the lamb as early as possible, and rightly considered that few ewes could produce two such lambs as would meet with their wishes and realize their object. The fact, moreover, is, that the exclusive attention paid to the establishment of a race, the vital energies of which were to be exhibited in the attainment of early maturity and in the quick accumulation of fat, while productive of the results aimed at, necessarily entailed counterbalancing deficiencies. A tendency to rapid fattening and early ripeness is not co-existent, as a general rule, with great fertility. In this point, then, the new Leicesters are defective, but less so than formerly. Still the ewes do not yield any great abundance of milk, and the lambs are tender, delicate, and unfitted to endure any great inclemency of weather.

Such, then, are the new Leicesters, to which so many other breeds owe their improvement by crossing: indeed, if we limit our attention to this part alone of their history, the benefits resulting from them will be found as important as they are extensive. Not only have they improved the long-woolled races of our island, but also various strains of the short-woolled sheep, sometimes perhaps to the diminution of the hardihood of the latter, and always to the increase in the weight of the fleece and its acquisition of greater length and fineness of staple, changing it from a clothing wool no longer marketable, into a valuable combing *middle* wool for which there is a constant demand. In the midland counties the influence of the new Leicesters is everywhere apparent; if we visit the southern and western counties we still observe the effects of their introduction; and the same observation applies to the north, and even to Scotland, of which the Cheviot sheep owe to them many of their present excellences, as early ripeness, improvement of fleece, and amelioration of form. It would be folly to attempt to naturalize the new Leicesters on coarse, lean pastures, on wilds, heaths, and mountain moorlands; they would rapidly degenerate, and few of their lambs, with the best care, would survive the winter; but, as in the instance of the Cheviots, the hardy mountain sheep may derive no trifling improvement from a cross, and that too without a loss of hardiness.

With regard to the extent of the improvements effected in

our long-woolled breeds of sheep by means of the new Leicesters, they will be best appreciated from a slight sketch of the history of the principal breeds coming under that denomination.

There has long existed in the north, in the country of the Cheviots and the black-faced sheep, a long-woolled breed extending along the sea-coast of Northumberland and Durham. This sheep possessed many good qualities, and afforded scope for improvement. Its aspect was lively, its contour was very tolerable, its limbs were clean, and its wool was thick and moderately fine. Already had this breed been crossed with the Lincolnshire and the Teeswater, but in neither case with any decided advantage, and the breed remained in its original condition.

The first attempt at the improvement of this stock appears to have been undertaken by Mr. Charge, of Newton, on the Yorkshire side of the Tees, who brought to Morpeth some rams of the Dishley breed; but the farmers did not perceive their merits—he could not let them for anything like an adequate price, and was consequently disappointed in the result of his praiseworthy endeavours.

It was shortly after this occurrence that the Messrs. Culley commenced their labours on the farm of Fenton, near Wooller, in the immediate vicinity of these sheep. These admirable farmers were the contemporaries of Mr. Bakewell; they had associated with him, they had watched his endeavours, they saw his success. With the merits of the newly-established Dishley breed they were familiar, and they were acquainted with its proper management. Their first care was to procure some of the Dishley or New Leicester sheep, and then to apply themselves to the arduous task of improvement, endeavouring to effect in the north what Mr. Bakewell had done in Leicestershire and the adjacent counties. In spite of every obstacle, they resolutely persevered, and after a long struggle finally triumphed.

The change which Mr. Culley's variety of the Dishley sheep effected among the old long-woolled sheep soon became very decided; they rapidly improved, and have by repeated crossings in a great measure merged into the Dishley strain.

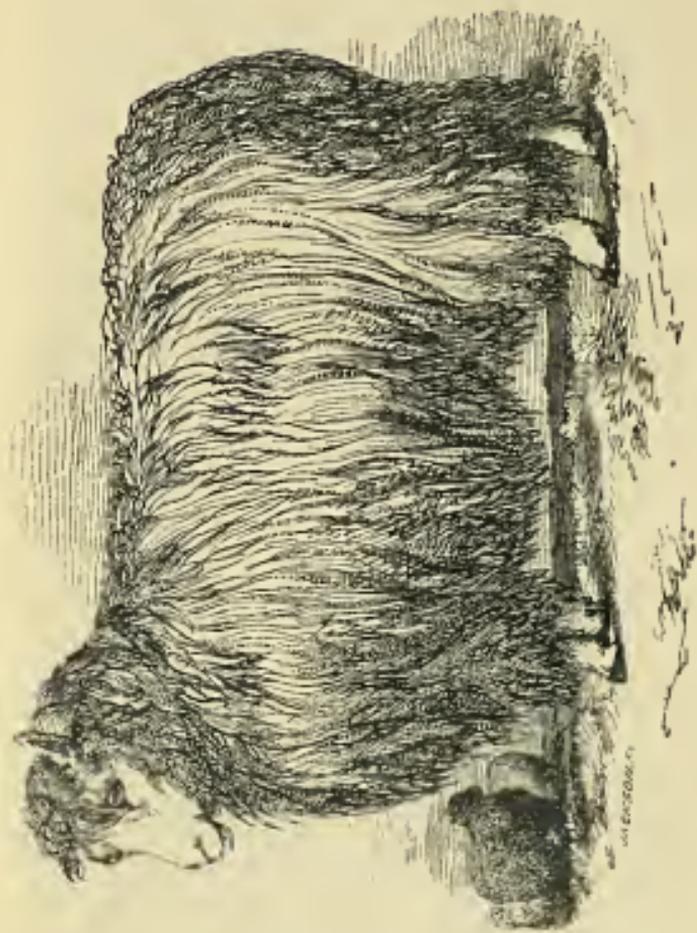
Another long-woolled breed of the north is, or rather was, well known as the Teeswater. It derived its name from the river Tees, which divides the county of Durham from Yorkshire, on the borders of which, on each side of the river, it

was occasionally bred, its range being limited to the lower grounds. The old Teeswater, as it once existed, is not now to be seen; it is so crossed and re-crossed by the Dishleys that it may be said to have merged into them, and lost its original distinctiveness.

Lincolnshire from time immemorial has possessed a long-woolled breed of sheep, of which Ellis says, "They were the longest-legged and largest-carcased sheep of all others, and although their legs and bellies were for the most part void of wool, yet they carried more wool on them than any sheep whatsoever."—*Shepherd's Guide*.

Mr. Culley gives a somewhat different account of the Lincolnshires. "They have," he says, "no horns, white faces, long, thin, and weak carcasses; the ewes weighing from 14 to 20lbs. per quarter; the three-year-old wethers from 20 to 30lbs. per quarter. They have thick, rough, white legs, large bones, thick pelts, and long wool, averaging from 10 to 18 inches, weighing from 8 to 14 lbs. per fleece, and covering a slow-feeding coarse-grained carcase of mutton." "This breed," he adds, "is most prevalent in Lincolnshire; which fertile district has the same right to be called the *mother county*, or country for *long-woolled sheep*, that Lancashire has to long-horned cattle. But the comparison may be carried further, for as this last-named county, from paying too much attention to big bones, hides, and horns, suffered the Leicestershire and Warwickshire breeders to steal from them their valuable breed above referred to before they were well aware of it, so also the Lincolnshire breeders, by too great a fondness for heavy wool and large-boned sheep, suffered the same discerning breeders (Mr. Bakewell and others) to rob them of a much more valuable breed of sheep, which they were undoubtedly first in possession of, before they were sufficiently sensible of the value of them.

"It is true that the Lincolnshire breeders can justly boast of clipping the greatest weight of wool from a given number of sheep of any other set of people in this island; but then this very heavy wool seldom or never fails to cover a very coarse-grained carcase of mutton—a kind of mutton well known for its coarse grain and big bones in the London markets, which not only sells for less money by the pound in the metropolis than any other kind of mutton, but in every market in the island wherever it happens to have been exposed for sale, and has brought an odium upon the large



Lincoln Sheep, p. 48.



mutton which the best kinds do not deserve. Yet this is not the worst of it, for this kind of sheep cannot be made fat in a reasonable time in any part of the island except Romney Marsh, their own rich marshes in Lincolnshire, or some very rich grazing grounds. Perhaps this is the best reason we can give for a set of sensible men so long adhering to this coarse-grained slow-feeding tribe. Indeed, the prodigious weight of wool which is annually shorn from the sheep is an inducement to the marshmen to give great prices to the breeders for their hogs, or hogrils as they are there called, where they must be kept two years before they get them fit for market; yet in the mean time they get three clips of wool from them, which alone pays them well in those rich marshes." We cannot help thinking the latter a good reason why these sheep were esteemed in the marshes of Lincolnshire. The fact is, that Mr. Culley, like his great master, Mr. Bakewell, utterly disregarded wool; these breeders looked at it as of very second-rate importance, and deemed carcase and early fattening to be all in all. By neglecting the fleece as they did, they left work for others to accomplish after them, for it soon began to be discovered that wool was important, and that good wool might be brought to cover a good carcase.

On the other hand, it may be admitted that the Lincolnshire farmer too much neglected the carcase; he aimed exclusively at the maintenance of a first-rate wool-bearing animal, and he looked to wool for his profit. For such sheep his rich marsh land was expressly adapted: "they were made for and by the district on which they were found, and when removed even to good keep, but in a district of a different description, they rapidly degenerated." The fleece which this breed yielded was unrivalled of its kind, and for centuries had supplied the looms of Norfolk; it was not very fine, perhaps rather coarse, but as combing wool it was deservedly estimated.

Thus, then, were the new Leicesters and the old Lincolns the opposites of each other. Their respective qualities were essentially different, and each breed claimed its zealous partisans. Gradually, however, this spirit of rivalry abated, and crosses were tried between the Leicester rams and the Lincolnshire ewes. The result as regards improvement in contour and early fattening was decisive, and the weight to which the cross breed might be brought was very great, and that too with less comparative expense of food than formerly.

So far it may be granted that the intermixture of the Leicesters with the Lincolns has tended to the improvement of the latter. When, however, we look at the wool, we are not quite so sure that this has undergone a parallel advancement. The fleece is now lighter and shorter than it used to be; it is finer in the staple and of a better colour, but is more tender, having lost much of that toughness which is indispensable in good combing wool, while as a felting wool it has gained nothing, being as it was before, in this respect, almost at the bottom of the list. Any detriment, therefore, to its combing qualities, for which it formerly ranked so high, must be a disadvantage; and although it may be well fitted for the manufacture of some articles, it is less adapted for the better sort of worsted fabrics. If length and toughness of staple could be restored, and the fineness which it now possesses retained undiminished (and with proper care in the selection of breeding stock this may perhaps be fully accomplished), then the Lincolnshire sheep would take a high rank, perhaps the highest, among the improved long-woolled breeds of our island.

There is, however, still some difference in the characters of the wool of different breeds of Lincolnshire sheep. Those which are bred on the wolds are much deeper crossed with the Leicesters than those bred on the marshes, and the latter consequently have a coarser, longer, and heavier fleece. The wold sheep are, however, predominant, having increased of late years, and especially since the introduction of the turnip system. They are reared chiefly on artificial grasses, and some also on old pastures, and afterwards put upon turnips. Shearing takes place in June; no smearing or ointment is afterwards used. The fleece averages 7 lbs., but is heavier on coarser marsh sheep; the length of the staple varies from seven to nine inches.

Another breed of valuable long-woolled sheep is the Romney Marsh breed.

Romney Marsh is an extensive tract on the coast of Kent, reclaimed in ancient times from the sea. It is celebrated for the richness of its pasturage, and contains about 24,000 acres, and is in one part protected against the sea by an embankment called Dymchurch-wall.

On this level feeding-ground, over which the eye stretches for many a mile, thousands of sheep may be seen feeding in tranquillity; and the picture in summer, albeit monotonous,

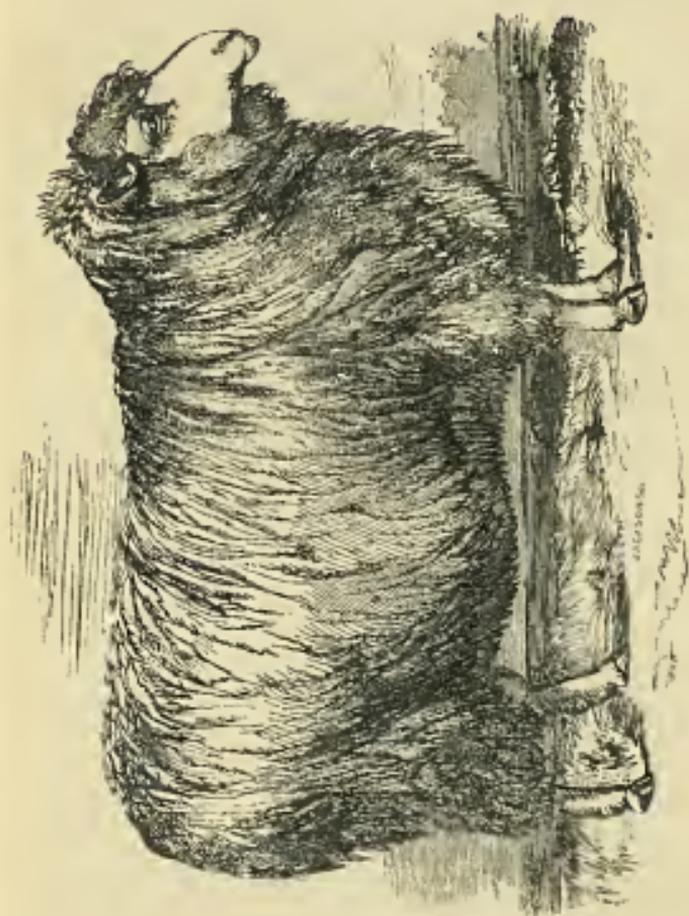
is yet very pleasing, at least to those who delight to gaze upon flocks and herds, and contemplate calm scenes of peaceful serenity, such as those which the magic pencil of Cuypp has so admirably depicted—scenes in which the land and its productions, the sky, and the cattle seem to compose one harmonious whole, soothing to the eye as music to the ear.

The sheep which these Marshes feed are of an ancient race, which for ages has occupied the same locality, and, amidst many changes, preserved its own characteristic peculiarities. Within late years, indeed, these sheep have undergone some degree of modification, we may say improvement, and that, too, by crossing with the Leicesters, while at the same time they still retain sufficient distinctness, and have not, like some others, melted and become fused into the latter Hardiness, the power of enduring severe cold, and the capability of thriving even with close stocking on the ground, together with good wool, were and still are among their qualities. Still, as we have said, they are modified, and to know what they were between forty and fifty years since, we must see what the writers of that day say respecting them. Mr. Price (*On Sheep*, p. 109), who was a farmer on the borders of the Romney Marsh, says of them that, when pure, these sheep "are distinguished by thickness and length of head, a broad forehead with a tuft of wool on it, a long and thick neck and carcase. They are flat-sided, have a sharp chine, are tolerably wide on the loin, have the breast narrow and not deep, and the fore-quarter neither heavy nor full. The thigh is full and broad, the belly large, the tail thick, long, and coarse, the legs are thick, the feet large, the muscle is coarse, the bone large, the wool long but not fine, and coarsest on the breast. They have much internal fat, and are great favourites with the butcher. They have much hardihood; they bear the cold and exposed situation well, and they require no artificial food during the hardest winter except a little hay. The wethers seldom reach the market till they are three years old; they then weigh from 10 to 12 stones of 14 lbs. to the stone, and the ewes from 9 to 11." The fleece averaged  $6\frac{1}{2}$  lbs. or 7 lbs. It was very useful for home purposes, but the greater part of it was exported to the Flemish and other markets on the Continent.

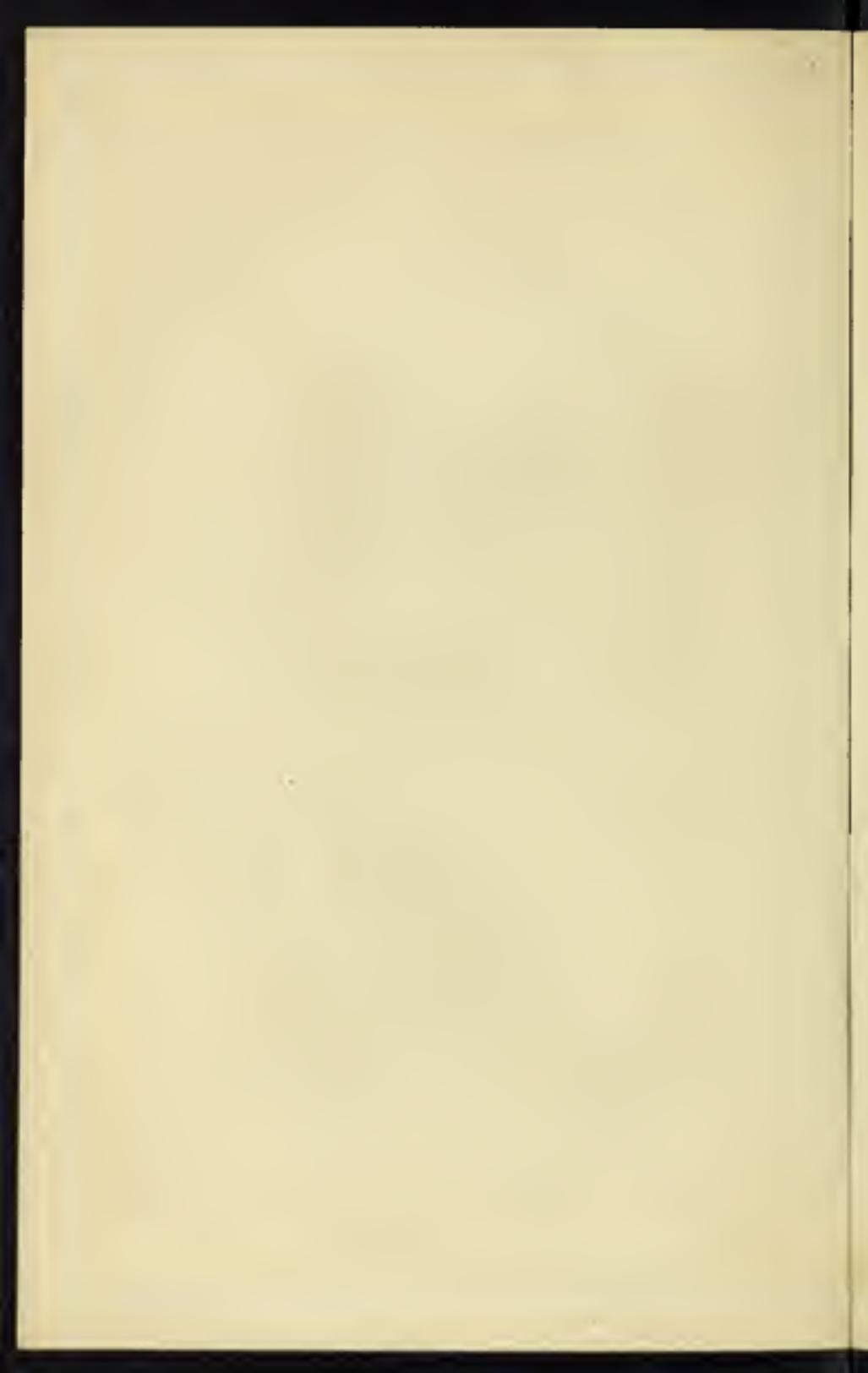
From the foregoing description it is very evident that there were many points in the Romney Marsh sheep which might be altered for the better. But, long habituated to these

sheep, the Kentish farmers saw no fault in them, and were unwilling to risk the chance of their degeneracy by any cross, whatever might be urged in its favour. They were right to be cautious; this breed was, like the marsh sheep of Lincolnshire, formed by and for the peculiarities of their ancient territory; they were, so to speak, *indigenes* of the soil. Besides, the Leicesters were a tender race, unfitted for such a situation, and incapable of thriving there; and it must be confessed that had the cross with the Leicesters been carried to an extreme, a complete failure would have been the result; as it was—for after some time the Leicesters began to be interbred with the Romney Marsh sheep—the advantage proved very doubtful. The mixed progeny were inferior in size and inferior in wool, both as to quantity and quality; and the first feeling was that of disappointment. When, however, the farmers began to look more narrowly at this half-bred stock, they found it not altogether so bad as they first imagined; if the sheep was smaller, it was a closer, more compact, and better-formed animal than the old breed, and for its size weighed heavier; it consumed far less food, and could bear still closer stocking than before; it fattened far more rapidly, was ripe a year earlier than formerly, and therefore the sooner fit for the butcher. Moreover, it laid on its fat externally, to the advantage both of the farmer and the public at large, and not as before internally, to the profit of the butcher alone. The fleece, too, if less heavy, was finer in the staple and improved in colour. The farmers now recovered from their disappointment—they perceived that they had gained an advantage; and those who had judgment proceeded to breed from this stock, making careful selections for the purpose. Thus the improved Romney Marsh sheep were established. It is still the practice to have occasional recourse to the Leicesters, in order to maintain the good qualities thence derived, but only occasional recourse; for were the Leicester strain to predominate, or even to exceed a certain point, the sheep would be too tender for their locality, and lose all their old hardiness. The desirable improvement having been gained, a further admixture of the Leicester blood is not generally advantageous, unless where it seems necessary, and even then selection may absolutely be the more prudent plan.

It would seem that the Romney Marsh sheep had a very close ally in a breed of Devonshire, called the South-Ham



Romney Marsh Sheep, p. 52.



Notts. In figure and quality of wool they both resembled each other; but the face and limbs in the Devonshire breed were brown. This breed is now greatly modified by intermixture with the Leicesters, and with the usual results. The form is highly improved, though with a diminution of size. The disposition to fatten, and at an earlier age, is much increased, and the fleece is shortened, finer, and lessened in weight; at the same time the brown tint of the face and limbs has disappeared.

There is another breed of long-woolled sheep in Devonshire, called the Bampton sheep. Some derive these sheep from the Western Down race intermixed with the old Leicester strain; while others affirm that from long antiquity the old breed has existed in the neighbourhood of Bampton. They describe it as large, white-faced, large-boned, and long in the legs and body. The average weight of a fat ewe was at the rate of 20 lbs. per quarter, and of two-year-old wethers 30 or 35 lbs. The fleece was heavy, being on the average 9 or 10 lbs.; but a ram weighing, as calculated by the eye, 40 lbs. the quarter, has given to the shearer 18 lbs. of wool. The wool was long, rather coarse, tough, and generally useful.

Such was the old Bampton sheep, be its origin what it may. But it has now been interblended with the new Leicesters, and the usual results have taken place. The new Bamptons are almost, if not quite, Leicesters in appearance. They have the Leicester contour and fattening capabilities, the wethers being ready for the butcher at the age of two years. The average weight is 20 or 22 lbs. the quarter. The wool is lessened in weight, in length, and toughness—it is finer but more tender; and the fleece averages 8 lbs. The lambs are more difficult to rear than formerly, and the new race has altogether lost something of its hardiness; still it is very valuable to the breeder. It occupies the low and fertile pasture lands of the south of Devonshire, extending to the vale of Taunton and far into Somersetshire.

We have already noticed the short-woolled sheep of Gloucestershire, but there is a long-woolled race for which this county has long been famous, known under the name of the Cotswold breed.

We should here observe that Gloucestershire is naturally divided into three distinct districts of very different character, which may be termed respectively the Hill, the Vale, and the Forest districts. The Hill district is formed by a range of

high land running entirely through the county from north-east to the south and south-west. Its course is nearly parallel to the Avon and Severn, at a distance varying from six to ten miles, and running in a line from Chipping Camden to Broadway Beacon (1086 feet high), Winchcombe, and Cleve Station (1104 feet) on to Cheltenham, which lies in a beautiful valley formed into a kind of amphitheatre by the western side of the hills. This range is called the Cotswold Hills, according to Camden, from two particulars; viz., the sheepcotes here from old times so numerous, and the elevated nature of the tract, the term *wold* being equivalent for that of hill. From Cheltenham the high ground runs west to Painswick, where it turns more to the south, and passes Wotton-under-Edge and Chipping Sodbury, and passes out of the county into Wiltshire and Somersetshire, forming the high ground around Bath. The Cotswold range of hills divides the basin of the Severn from the basin of the Thames.

The cots or cotes on these hills demonstrate the care and attention paid to the sheep of this district in olden times, and consequently the value in which the latter were held. They consisted, according to Camden, not only of rude huts or sheds, but of extensive ranges of buildings consisting of three or four low stories, communicating with each other by means of gradually-sloping ascents or pathways, so that the sheep had no difficulty in ascending to the topmost story. Thus no room was lost, and the most efficient shelter was provided for the flock either by day or by night during the continuance of winter, or at the lambing season, or when it was deemed advisable to house them.

The wool of the Cotswold sheep was formerly held in high estimation.

The old Cotswolds were a large hardy race of sheep, big-boned and long-woolled, and well adapted for the hill range which constituted their stronghold. To judge from the relics still extant (though not pure), they were flat-sided, deficient in the fore-quarter, heavy in the hind-quarter, slow fatteners, and clothed with a long and weighty fleece, this latter being variable in quality, but always truly valuable as a combing wool. But the old breed is now more or less modified; and although it has not merged into the Leicester, it is in many parts deeply imbued with the Leicester blood; in other parts, on the contrary, where hardiness is peculiarly essential, the cross of the Leicester breed has been only carried out so far

as to give those improvements which we have more than once detailed as the invariable result of even a single cross with this peculiar strain.

Like the pure new Leicesters, the Cotswolds or cross-bred Cotswolds have been extensively employed for the improvement of other breeds; and in many instances the latter are preferred to the former, from their superior size and hardiness. In the Welsh valleys,—as, for example, the vale of Glamorgan,—the pure Leicesters, the half-bred Cotswolds, and even still purer Cotswolds, have been adopted with success, to the exclusion of the native stock.

In Oxfordshire, a long-woolled breed has long flourished on the banks of the Charwell, and in other parts of the county; but the Leicesters now chiefly prevail, and many flocks of Southdowns are to be seen. A breed called the New Oxfords has been recently established. They are bred in Oxfordshire and the surrounding districts, “particularly in the neighbourhood of Broadwell, the residence of Mr. Charles Large; Charlbury, the residence of Mr. Smith; and Swenhampton, the residence of Mr. Handy, the most eminent of breeders; and to whom great credit is due for their exertions in raising this valuable breed to its present high state of perfection. They are of large dimensions, and have a great propensity to fatten, arising chiefly from their wide frame, quietude, and open texture of flesh, which is of quick growth, and consequently expands itself more rapidly than in sheep of other qualities; but they do not possess that exactness of form peculiar to smaller animals, though they have a better carriage. For many years the male animals have been eagerly sought after with a view to increase the size and frame of other long-woolled breeds.”—*Robert Smith*. In many respects these sheep approach the Cotswolds, and are said by their admirers to yield finer-grained meat.

In taking a general survey of the long-woolled breeds of sheep as they exist at the present day in our island, we cannot but perceive the general influence which the new Leicesters have exerted far and wide in the modification of the old large-boned, ill-formed, slow-feeding sheep of the last century. Indeed, we now know these latter only from the descriptions of them which have been left us. In Leicestershire, Nottinghamshire, Warwickshire, Derbyshire, and, in short, throughout the midland counties generally, the old long-woolled sheep, essentially the same in characters,

were large, gaunt, clumsy animals, huge feeders, and slow fatteners. The farmers were content—nay, more, they scorned all ideas of improvement as visionary; the sheep were what they were in their forefathers' time; and as regarded the system of husbandry in general, the great principle by which the farmer was guided was to pursue, with as little variation as possible, the practice of his forefathers. Science was not the handmaid of practical farming, the land was not economized, and time, money, and food were wasted upon animals which ill repaid the farmer for his trouble and outlay. But the dawn of a revolution was at hand; chemistry, geology, and physiology had reared up temples in the land, whence radiated a light before which the clouds and mists of ignorance began to be dispelled. The genius of agriculture awoke from a long trance, and a new era commenced. Old plans became obsolete, and as a new system developed itself, so in a parallel ratio were improvements instituted in the breeds of horned cattle and of sheep over the country generally. Then it was that men of enterprise, acting on sound principles, aimed at the elevation of different races—at the establishment of a stock destined to effect great changes, great improvements, in all our native breeds. It was then that the improved race of long-horned cattle arose, and the still more influential breed of Dishley sheep. From that time the star of the old unimproved races began to set; breed after breed either disappeared or became fused into this new strain, till at length the permanent establishment of the new Leicesters was achieved. The Dishley stock was triumphant.

While these alterations were taking place, circumstances were in operation which led to the depreciation of the fleece of our once famous short-woolled breeds. It was less and less in demand by the manufacturer; he could import a better and finer material at a cheaper rate. Germany had risen in the list of countries celebrated for Merino wool. In England the Merinos, though promising at first, failed to produce any permanent results, at least on an extensive scale. To Germany, therefore, not excluding Spain, the manufacturer looked for his supply, and Australia put in her claims to his notice. At this juncture of affairs the short wool began to assume an altered character,—it changed into a middle wool, even fit for combing; it was no longer a carding wool only, nor was it in request for fine cloths. This change arose partly from interbreeding, but perhaps more from the altered

system of sheep husbandry and agriculture. The turnip and artificial grass system, by means of which not only can an ample supply of food (the year being moderately propitious) be afforded to the flock, but a double, and in some places a treble, number of sheep be maintained with comfort and plenty on the same area of ground. Added to all this, the increased means of fattening early and quickly, and the desire of the farmer to avail himself of these means, had their effect. He crossed, or he selected as breeding stock, sheep likely to answer his expectations in this very important point, and he succeeded. But what was the result? As the carcase increased in weight, so did the fleece, and its staple became longer and thicker. At first the farmer could not perceive this change, but the manufacturer quickly discovered it. It was in vain for the farmer to assert the superiority of his short wool to that of any nation. The manufacturer had only to show him Merino, or Saxo-merino wool, and to point to his bales of cloth fabricated from English short wool, which were now a drug in the market; the fact could no longer be gainsaid. The English short wool had altered; it had become middle wool, and though scarcely marketable for clothing purposes, it was admirably adapted for many new kinds of fabrics which ingenuity devised, and highly perfected machinery enabled the designer to accomplish. The farmer then had no room for complaint if his wool sold at something less per pound than formerly. He had increased his sheep in size and symmetry; he could rear double the number on the same ground; they came to maturity twelve or sixteen months earlier than of old, and were fattened off with less outlay. In the mean time population was on the increase, and the demand of animal food for the supply of the markets in proportion.

#### THE SHEEP OF IRELAND.

From this sketch of the principal and most influential breeds of British sheep, we may turn to those of Ireland, an island, from its climate, its pasturage, and its general character, admirably adapted for the rearing of flocks. From whatever source originally derived, the hills and valleys of Ireland, from the olden time to our own days, have afforded support to numerous flocks of sheep, noted for the goodness of their wool.

It is almost impossible to say what the characters of the

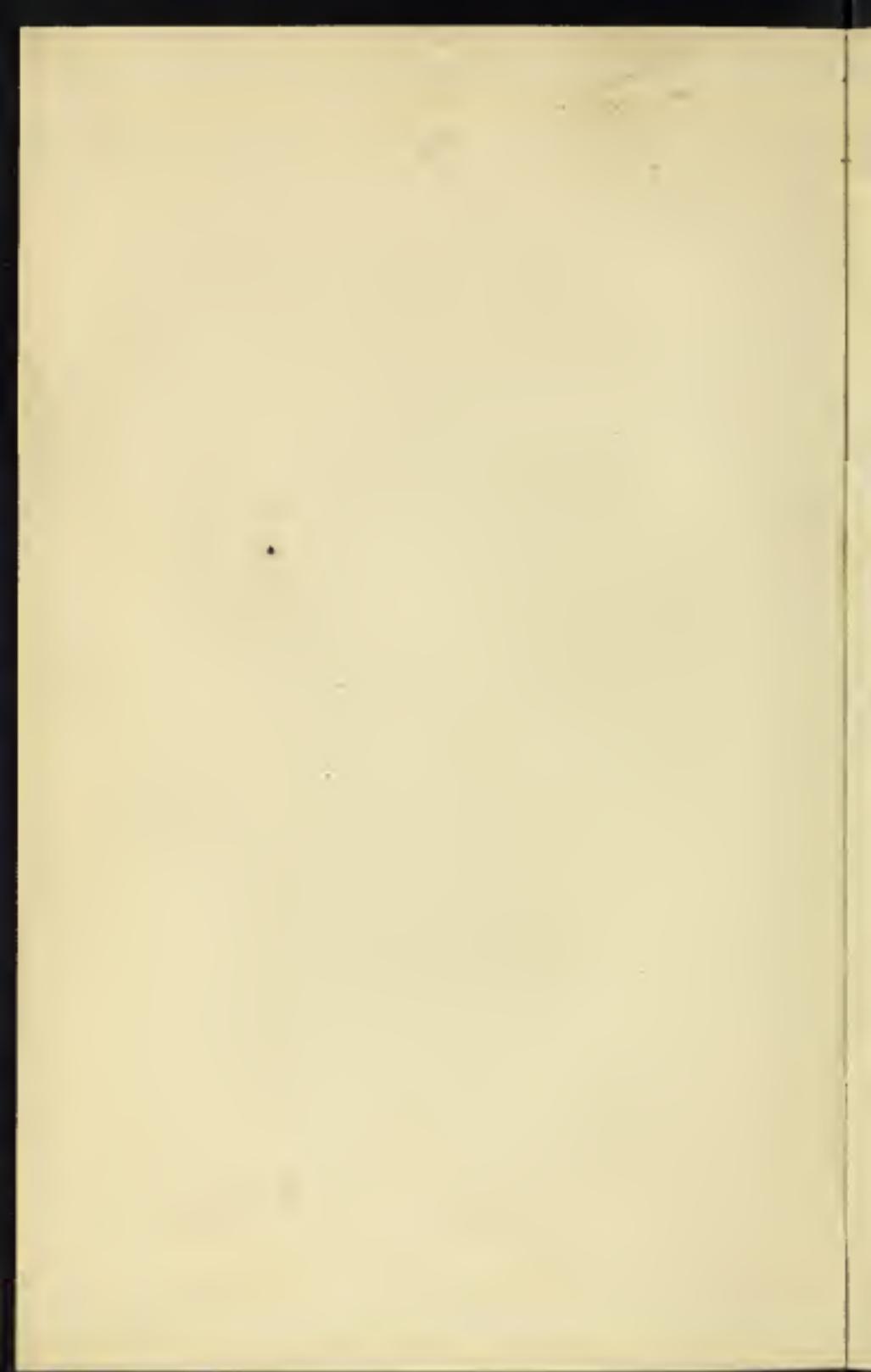
ancient Irish sheep were ; it would appear, however, that two breeds, each having perhaps several varieties, divided the island between them : one was a short-woolled race, the other was long-woolled. The short-woolled race was peculiar more especially to the mountains, as those for example of Galway and Connemara, where it is termed the Cottagh sheep ; this breed still survives, and is kept pure on the mountains in many districts : it is a sheep admirably adapted to its own ancient territory. The head is small, short, and round ; the ears are upright ; the neck is long, and the general contour rather slender, but still admirable ; the limbs are small-boned and clean, denoting vigour and activity. The wool is variable, sometimes wavy, sometimes matted, and that on the tail and parts adjacent is coarse ; the head is only covered with close hair. The fleece averages from two to three pounds, the fibre being about two inches in length. It is very useful in the manufacture of flannel, of which a great quantity is made, and sold chiefly at Rathdrum. In this ancient race there is manifestly an excellent ground-work for improvement, and that through the intermixture of the Southdowns. We may add, that this source of improvement has not been overlooked ; in fact, the intermixture has been carried extensively into effect, with favourable results, not only as to the character of the sheep themselves, but also of their wool. It is an intermixture of cognate races. The Merino has been tried, but without success ; the cold and humid hills being uncongenial with its temperament.

It was into Wicklow that the Southdowns were first introduced by the Farming Society of Ireland, for the gratuitous use of the breeders. At first rams only were imported, but afterwards ewes, and some spirited cultivators encouraged the breeding of this stock. Premiums were offered by the Society for the best piece of cloth manufactured from Irish Southdown wool ; and in 1809 and 1810 Southdown wool, at the annual clothing sale at Dublin, sold for enormous prices.

With respect to the Irish long-woolled sheep, they were formerly ill-shaped animals and slow feeders, but they scarcely deserved the censure of Mr. Culley, whose eye, accustomed to his own valuable breed, became over-sensitive when points of inferiority were brought under its scrutinizing glance. At the same time he gives to the " Mr. Frenches, and some other spirited breeders," great credit for their exertions, and the crosses they effected, not without expense and hazard, for at



Irish Mountain or Cottagh Sheep, p. 58.



that time there was a law in full force against exporting sheep into Ireland, as into France, or to any of our so-called *natural* enemies on the Continent. We will not enter into politics, only this we may say, What means of improvement had the Irish farmer under such a stringent law? Happily it is abolished, and what is more, and in what Mr. Culley would have rejoiced, his favourite and beautiful Dishley sheep were destined to effect the most extensive reformation. At first, as might be expected, this breed was opposed; it had to contend with prejudices (what instrument of reform and general benefit has not?); but, as it had done before, it triumphed over all difficulties, and became of acknowledged importance. In short, Ireland began to show an improved breed equal to that of the midland counties themselves. A new impetus was given to the breeding of long-woolled stock, and in proportion as this stock spread, the short-woolled sheep were more confined in their range, perhaps more neglected, and ceased to be regarded as valuable; their wool was not in request, it could not compete with the Saxo-merino; but the wool of the other race soon equalled that of the best Leicesters, nor as regarded fattening and early maturity, were these sheep in the background.

## CHAPTER II.

## GENERAL MANAGEMENT OF SHEEP.

THE routine to be followed by a farmer in the feeding of his sheep depends entirely upon the character of his ground, and the breed he cultivates. There are, however, few localities in which turnip husbandry cannot be carried on. Light soils will yield the common white turnip, while the richer, heavier, and more nutritious Swede will, on stiffer ground, produce a valuable crop. The turnip system supposes what is called "artificial feeding;" that is, a plan of feeding on vegetable productions sown expressly for that purpose. Of these productions the turnip is most deserving of notice. The crop of this root not only supplies abundance of winter nutriment, and by its very culture clears the ground; but beyond this, the depasturing of the sheep upon it leads to the preparation of the soil for other crops in the most economical manner. The sheep farmer who has land under turnip cultivation, should, if possible, have at least two relays of flocks; first, his *fattening sheep*—these should be penned day after day on fresh patches (not without a little salt to lick), and allowed to pick and choose for themselves; on this plan they thrive better than if the roots were dug up and given to them in any other sort of inclosure: perhaps the little quantity of earth which they take into the stomach may act beneficially, and as a corrective against the production of acid and gas: secondly, *store sheep*—after the fattening sheep have been removed from a patch of land, these may be hurdled upon it, and will clear it effectually, while, with their predecessors, they return good service to the farmer in the shape of manure.

In addition to turnips we may here observe it will be found, in the long run, advantageous to give a daily portion of oil-cake, &c., notwithstanding the expense of purchasing; for not only will it make the crop of turnips last longer, but tend to

enrich the soil far more than if turnips alone be given as food. It is a cheap and easy way of manuring the land, and positively repays the farmer. The sheep, moreover, thrive better, and are sooner ready for the market. By a constant attention to the equal distribution of a flock, fed upon turnips and supplied with a certain quantity of oil-cake daily—an artificial food, as it has been called—the best results may be expected.

By the use of artificial food the vegetable produce is much economized, the animal is kept longer upon the land, and becomes more healthy, and less liable to disease.

To revert, however, to the turnip as food for sheep. It must be confessed that in some years, from various causes (as the fly, *Haltica nemorum*, and one or two allied species), the turnip crop is liable to a failure; and, under these circumstances, the farmer who has trusted to his turnip crop is distressed to find food for his sheep. Could the farmer foresee a failure in turnips he would most likely cultivate a sufficiency of mangel-wurzel, though this would be at the expense of deteriorating his land. On this root, and on hay, the fattening flock might be well managed, but without profit; for not only will their manuring of the land be lost, but the land on which the mangel-wurzel is grown will require preparation for another crop, be it what it may, and the hay might be used for other purposes. Besides, with respect to mangel-wurzel, although it increases the milk of the ewes, and fattens the sheep, still, if given largely at once (the animals feeding voraciously), it is apt to produce sickness, and a sort of surfeit, attended by a falling off of the wool in flakes, more especially in ewes at the lambing-time, or with young lambs, unable to drain the preternaturally distended dugs of their mothers, fed upon this rich, saccharine, succulent root.\* A little good management, of course, obviates all this danger; still it is right to notice it. Let dry food, such as hay, be given largely

\* Some breeders are loud in their praise of mangel-wurzel, from its succulency, its abundance of saccharine matter, and its powers of increasing the flow of milk, so essential to the lamb. On the other hand, Mr. H. S. Thompson says, "After trying mangel for four successive years, I came to the conclusion that cows fed on it gave quite as much milk, but much LESS butter and cream than when fed on turnips or carrots; also that when the ewes were fed on mangel-wurzel, the lambs threw remarkably ill, which I attributed to the same poverty of milk which had been proved in the case of the cows. The kind was the orange-globe: the roots, large and perfectly sound, were not used till after Christmas, and were grown on land of rather weak staple, but what is termed hereabouts good sand land."—*Farmer's Magazine*, 1847, p. 149.

at first with mangel-wurzel, and the proportions of the latter increased gradually. However, as we have said, this is not the way in which fattening sheep will return a fair profit. We are speaking of an expedient to which the farmer may have to resort, and not to the broad outline of his system.

To revert to potatoes. Granting that the crops will be in future years what they once were (and we devoutly hope that it may be so), we decidedly recommend that they be steamed or boiled (if given raw, sliced of course), but steamed if possible. Our own experience has proved to us that steamed potatoes are better by twenty per cent. for sheep and other cattle than when raw. The difficulty is, how can this steaming or boiling be managed? A farmer has a good flock of sheep. He cannot go to the expense that some of our noble agriculturists encounter without a moment's hesitation. They have their buildings all fitted up in perfection; they can afford the outlay; but how can the plain farmer, renting his two, three, four, or five hundred acres, afford it? Can it not be managed? We think not. A farmer's expenses are not light, and he has no money to throw away. It is not in every district that the seams of coal are available, and when this is not the case, fuel is dear. We mention this, because when speaking on this very subject to a valued friend—a practical farmer—and on proving to him, as we thought, how a steam apparatus for roots in general would *pay*, he said, "You come from the coal districts, and forget that I live where our common fuel is wood; and where coal is very dear, and wood in proportion. Try and feed 200 sheep on your plan, and then count your gains."

To revert to mangel-wurzel and potatoes. They should be sliced, and given in troughs, and not strewed on the ground; besides these roots, peas, barley-meal, ground corn, or green corn, oil-cake, &c., are among the articles of food resorted to, according to the convenience of the farmer. With respect to the Southdown sheep, the routine of artificial food is, generally speaking, as follows:—Early in spring, and about or soon after lambing-time, green rye will be in; but this should be given sparingly, otherwise it is apt to produce fatal diarrhoea. On this account it is unwise to fold the ewes on the rye during the night; and even during the day it is the safest plan to turn them off the rye, for a few hours, upon good old pasture land, where they will have a change of diet; and indeed, if they pick but little there, no matter, for time will

be given for the digestive organs to perfect their work—a point, in feeding upon all artificial grasses, to be kept in remembrance.

The rye will usually last till the latter part of May, when the ground is ploughed up for a crop of turnips or rape. To the rye succeeds rye-grass (*Lolium perenne*), which, when young and tender, is a favourite with sheep; it will afford food to the latter end of June; and afterwards, successive crops of winter tares will come in. We must suppose that these tares are sown in patches, not all at one time, but in succession, from the beginning of October to the beginning of the May following. By this mode of proceeding, crop after crop becomes available, till tares, clover, or rape take their turn. Which of these latter *grasses* the farmer must cultivate will be determined by the soil and situation of his farm; clover should perhaps have the preference, *cæteris paribus*: some may prefer rape.

Now comes on the winter supply—the turnip crop. As we have already said, the common white field turnip will thrive on light soils; but the Swedish is most advantageous on land adapted to it. The latter is the most nutritious by about 20 per cent.; and the larger and finer the root, the greater proportion of nutriment does it yield; on the contrary, in other turnips the moderately sized roots afford a greater quantity of nutrition than those which are overgrown. Huge spongy roots of white field turnips are very inferior. While feeding on turnips, let the farmer beware of *hoove*, or distension of the stomach with gas. Sheep should not be suddenly turned from a poor dry pasture to a field of these succulent and nutritious articles of diet. A gradual accommodation of the digestive powers to this rich food is advisable.

The Southdowns, as we have previously observed, are admirable folders, and bear the necessary travel well. Not so the Leicesters, or long-woolled sheep generally, and indeed with these the system of folding is rarely adopted, for neither will the nature of the sheep, nor the size of the farms, as a general rule, allow of this practice. The farmer feeds, as it were, by hand; he does not drive his flock to any distance. The general routine with respect to a flock of Leicesters has been thus succinctly and admirably portrayed:—"The ewes will approach their time of yeaning about the beginning or middle of March; and this being often an inclement season, and the Leicesters requiring more attention than the hardier

kind of sheep, the ewes that are coming into the last week of pregnancy should be separated from the others, according to their numbers, and brought nearer home, that they may be put into a yard at night, constructed for this purpose, having a good shed in it, and being well protected from the cold wind. They should have a plentiful supply of turnips, ox-cabbage, &c. The greatest attention should be paid them at this time, and the shepherd should be with them as much as his other duties will permit. If it is a peculiarly valuable flock, the shepherd should sleep on the premises, for the Leicester ewes are more liable to require assistance when yearning than any other sheep are. The lambs are generally large, and the ewes fat, and so a double difficulty occurs.

“The lambs are kept up for a few nights, leaving them out with the mothers in the day-time. They should be castrated when about a fortnight old; but a fine dry day should be selected, and they should be kept up for two or three nights afterwards. They should likewise be tailed at the same time. The lambs remain with their mothers till the beginning or middle of July; they are then weaned and turned into good pasture of seeds or grass, until the latter end of October, when they are put upon turnips,—sometimes the common turnips first, and afterwards the Swedes; but they do better upon turf, provided it is to be had, a few turnips being drawn for them when the weather is severe. The ewes remain on ordinary pasture, which will probably bear from seven to eight per acre, until two or three weeks before the admission of the ram, when they should be changed into good pasture, upon well-known principles. The ewes continue on the old pastures from the time the rams are removed until the end of November, when they are sometimes hurdled upon turnips, the fattening sheep having been penned upon them first, and the ewes following to make clean work.

“The lambs are seldom shorn until the second year, when the fleece will weigh between seven and eight pounds, the length of the staple being from ten to twelve inches. The aged ewes yield from five and a half to six pounds of wool. The usual time of shearing the store sheep is from the beginning to the middle or end of June. Sometimes, however, they are shorn in May, and yield each from 7lbs. to 9lbs. of wool. The washing usually takes place in the last week in May, after which the sheep are sent into clean pastures for a week or a fortnight before they are shorn. Some farmers per-

mit a longer time to elapse, in order to allow the yolk to rise into the wool; this makes it weigh heavier, and also work better in the manufacturing process. The yearling wethers are generally separated from the theaves (*gimmers* or ewes that have been once sheared) at the time of shearing, and they are put upon good keep, most frequently upon seeds. The theaves run upon the common pasture until the ewes go to better keep, previously to the admission of the ram. The wethers are generally kept on turnips, and sold in the early part of the following spring. On large and well-conducted farms, they have a rack in the field, well supplied with coarse hay or straw, and a trough is fixed under the rack, containing common or rock salt."

The ewes go with the ram from the beginning of October to the second week in November. One ram is the lord of about sixty or even eighty ewes; but a successor in his place is desirable, in order that the farmer may not be disappointed in his fall of lambs. His own observation must be here his guide—we need not enter into minutiae.

Now with respect to ordinary pasture land. It is almost needless to say, that, with the exception of hay or a few turnips in winter, sheep in many districts are kept entirely on the natural grazing ground. And here two points are material—first, the non-overstocking of the ground. It is a better plan to parcel out the sheep into small flocks, and keep them in adequately-sized inclosures, than to throw them together, and drive them to different parts of an extensive sheep farm; they do not settle down readily and quietly in new localities, and to drive them backwards and forwards is only to tease them. In an inclosed country, therefore, sheep will thrive the best on grass land partitioned off into inclosures of moderate size, the number of sheep being determined by the size of the inclosure; here they become contented, fatten kindly, and benefit the land. Secondly, the nature of the grass produce on which the sheep are depastured. Different lands produce different grasses; some grasses are fitted for meadow lands, some for permanent pasture grounds, and some are best fitted for the hills and uplands. A farmer often judges alone by the weight of grass a certain inclosure yields, irrespective of its comparative nutritive qualities, or of the predilection of the sheep for any particular sort. The various grasses not only differ as to their time of flowering and seeding, but as to the

quantity of nutritive matter contained in a given volume; and not only so, but this proportionate quantity differs at various seasons of the year, according to the condition of the grass. These are points which, although too often neglected by the farmer, ought to attract his serious attention; inasmuch as there is and must be an intimate connexion between the nutritive quality of the food, and the health and thriving condition of the sheep. It may be, moreover, that different breeds have their peculiar favourites—and this circumstance, as far as experience guides us, should be taken into consideration; for it must stand to reason, that sheep will not prosper on a pasturage towards the grass of which they have an aversion.

## CHAPTER III.

## ON THE DISEASES OF SHEEP.

IN our account of the diseases of the sheep, it will be our aim to simplify the details as much as possible, so as to render them useful to the farmer who possesses no accurate anatomical knowledge. We would here advise the farmer to beware of the nostrums of the farrier, and in all serious cases to call in the veterinary surgeon, by whom all important operations ought to be performed, if only for the sake of humanity, inasmuch as his knowledge and manual dexterity will often save needless sufferings.

Without entering into minute anatomical details, there are a few preliminary observations which we cannot avoid, and which will not, we think, be unacceptable.

First, with respect to the nervous system.—The brain of the sheep is somewhat larger, in proportion to the size of the animal, than that of the ox—that of the latter being about 1-800th part the weight of the animal, that of the sheep about 1-750th; and the proportion between the *cortical* or *cineritious* substance of this organ, and the *medullary* or internal substance, is about the same as in the ox; as is also the relative size of the nerves to that of the brain. In the sheep, the nervous energies are soon exhausted. It is not fitted for labour: it is destined by Providence to yield food and clothing to man; hence it receives no education—it is trained to no employment—it undergoes no discipline. Yet we do not rate the real intelligence of the sheep at a less degree than that of the ox. We have seen domesticated individuals as familiar, as bold, and as sprightly as the goat.

Secondly, with respect to the arterial and venous systems.—We need not particularly describe the heart, which consists of two auricles and two ventricles as usual; but we may

observe, that the right ventricle, which is considerably larger than the left, and has its muscular walls very thin, not only contains more blood than the left ventricle, but has less power to act upon it. The difference between these cavities is greater in the ox than in the horse, and in the sheep than in the ox. From the inefficiency of the contraction of the right ventricle, the whole of the blood is not expelled from it into the pulmonary system by each stroke; hence, under certain states of the circulation, it may happen that an accumulation of blood may take place in this ventricle which the muscular walls of the cavity may not be able to expel; and under such circumstances the danger of rupturing the ventricle would be imminent. But in order to prevent this, a strong muscular column, of considerable thickness, extends obliquely across the ventricle from the upper part of the inner wall, or division between the two ventricles, to the lower part of the outer wall, and by its contraction supports the ventricle where the wall is thinnest, and assists its expulsive action. Besides this, there is a second tendinous band lower down in the ventricle, with many roots, which still further contributes to the security of the part. In the ox, we find a similar provision for strengthening the right ventricle as in the sheep, but somewhat modified.

The oppression to which, in these animals destined to give us food, the heart is liable from over-driving and severe exercise, ought to be impressed upon the mind of all shepherds and farm servants, all drovers or men who have to do with these animals. It is, we would wish to persuade ourselves, more from ignorance than wanton cruelty that these animals are often, as we have seen, so severely punished. He that knows what it is to labour under oppression of the heart, either from violent running or from some organic affection, will feel for a poor sheep, chased till it drops by the dog of some brute in human form.

There is another peculiarity in the heart of sheep and other ruminants which we may just notice. At the base of the aorta and pulmonary artery there is a bone, somewhat triangular in form, destined to support and strengthen both these most important vessels, but especially the former. A small bone of the same kind occurs in the heart of the horse; but in the sheep and ox these vessels are proportionably larger, and this bone (the *os cordis*) is in due relationship to them.

The arterial pulse of the sheep, adult, quiet, and in a state

of health, is about seventy per minute, or perhaps seventy-five. It may be conveniently felt at the femoral artery, which runs obliquely down the inside of the thigh; but the usual plan, in order to determine the force or weakness of the circulation, is to try the action of the heart itself, by placing the hand on the left side of the chest, where its beating may be felt. We need scarcely say, that the character of the pulse is a great guide in the diagnosis and treatment of disease.

There is another point connected with the circulation which demands notice. On the skin, as we well know, open the mouths of multitudes of exhalent vessels of great minuteness—the vessels of perspiration. These vessels are really the terminating tubes of minute arteries (for all do not merge into veins), through which effete matters from the blood are thrown off in the form of a fluid or vapour. But besides the simple exhalent vessels, there are others destined to produce secretions of a peculiar nature, of which we cannot often understand the utility—(take musk and castoreum as examples). Now, it would appear that the simple exhalent or perspiratory vessels on the skin of the sheep do not act with the ease with which they do in man, or the horse, in whom, labouring in muscular exercise, the flow of perspiration acts so beneficially, relieving the blood of its effete particles, to the benefit of the heart and lungs, to the freedom of respiration, and the maintenance of muscular energy.

But while the exhalent pores in the skin of the sheep are sluggish in their action, another set of pores are peculiarly active (if indeed the two sets are really to be distinguished from each other), secreting a peculiar unctuous fluid, commonly termed the *yolk*. This *yolk*, a soapy adhesive matter, is evidently provided for the nourishment of the wool, and for defending it from being saturated by wet. In the secretion of this, the skin of the sheep is greatly occupied, to the expense of what may be called simple perspiration. This secretion goes on regularly, and imbues the fleece, while that of the simple exhalents is thrown out with difficulty. In this circumstance we have another reason why sheep, when hurried or driven about, labour in breathing, and pant violently.

When man and the horse, with most other quadrupeds, undergo violent and especially rapid exertion, the blood, rushing with increased rapidity through the frame, and consequently undergoing changes more quickly than while the

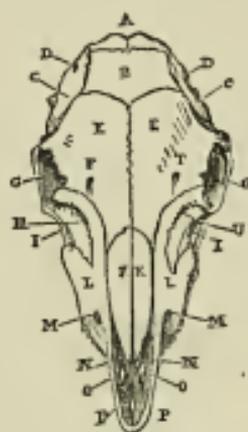
body is in a state of quietude, throws off a great portion of its effete or useless part in the form of perspiration.

The "toil drops" flow freely, to the relief of the system, and especially of the lungs, which would otherwise have a double duty to perform; and the fact is, that in the sheep, when over-driven, the lungs have to perform the double duty; hence the animal is soon distressed, breathes hard, and exhales from the lungs a great quantity of vapour.

The quantity of blood in the sheep is less in proportion to the animal's weight than it is in most other animals; and in abstracting blood care must be taken not to reduce the vital powers too low, for the sheep rallies with difficulty. This should ever be borne in mind. With respect to the quantity of blood to be taken from the sheep, it will of course vary according to the necessity of the case and the judgment of the practitioner, and may extend from half a pint or less to a pint, or even a pint and a half; but care should be taken to watch the first falterings of the arterial action. Blood is obtained from sheep in various ways. Some cut the nostrils, the ears, the lips, &c., giving pain and doing no good. Many shepherds bleed from the angular or cheek vein, and that by means of a lancet—the swelling of the vein being effected by dexterous compression with the fingers near the posterior angle of the jaw. But we deem it the best practice to bleed at once from the jugular or neck vein, as in the horse and ox;—it may be done without even cutting any of the wool away, but by parting it fairly asunder, and using the lancet neatly, while an assistant secures the animal. Pressure either with the fingers or by means of a ligature (but the former is the better plan) will make the vein rise; and the bleeding may be stopped by a pin and a little tow, or a few fibres of wool twisted round it. Occasionally the *saphena* or thigh vein is opened. The mode of bleeding with address and precision, whether it respects man or any of the lower animals, can only be acquired by observation and practice.

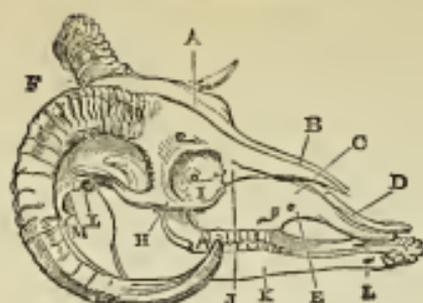
Thirdly, with respect to the skull.—It would be well if all sheep farmers rendered themselves well acquainted with the skull of the sheep, and kept by them for reference the skulls of the different breeds, and especially of those which they themselves have cultivated. There are certain diseases, afterwards to be explained, to which the sheep is peculiarly liable, rendering a knowledge of this part of the osseous framework of great importance.

It is not necessary to describe the general form of the skull of the sheep, because all are familiar with it. It differs in minor details in different breeds. Some have the jaws more elongated than others; some are horned, sometimes many-horned; others are polled; in some the forehead is very much elevated, or rather arched; in some it is nearly flat. The annexed views of the skull, in front and in profile, will serve to convey a clear idea of the relationship of the bones externally to each other.



FRONT VIEW OF SHEEP'S SKULL POLLED.

- A The occipital bone.
- B The parietal bones consolidated into one square bone, the suture having become obliterated.
- C The squamous portion of the temporal bone.
- D The meatus auditorius, or opening into the internal ear.
- E The two frontal bones, which in man form only one portion, as a rule.
- F Supra-orbital foramina, or orifices for the passage of nerves and blood vessels.
- G The bony orbits of the eye.
- H The zygomatic or malar bones.
- I The lacrimal bones, of considerable development.
- K The nasal bones.
- L The superior maxillary bones.
- M Suborbital foramen, for the passage of nerves and blood vessels.
- N The nasal processes of the intermaxillary bones.
- O The palatine processes of ditto.
- P The intermaxillary bones, on the under part of which the firm pad opposed to the cutting teeth of the lower jaw is seated.



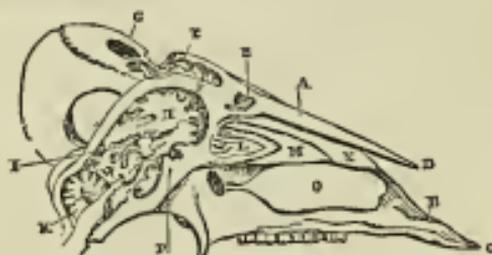
PROFILE OF SHEEP'S SKULL HORNED.

- A Frontal bones.  
 B Nasal bones.  
 C Superior maxillary bones.  
 D Intermaxillary bones.  
 E Suborbital foramen.  
 F Occipital bone.  
 G Temporal bone, with the auditory foramen or meatus auditorius.  
 H Malar bone, forming with the temporal bone the zygomatic arch.  
 I The orbit.  
 J The lacrimal bone.  
 K The lower jaw, or inferior maxillary bone, consisting of two branches united anteriorly, or at the chin, by a suture.  
 L Foramen for the passage of nerves and blood vessels.

The mode in which sheep attack an enemy is well known ; they run full butt against the object with all their force, the blow being given by the forehead, which has to sustain the violence of the concussion ; hence arose the name and figure-head or iron-arming of that engine of war, the battering ram, formerly used in demolishing the walls of beleaguered cities. It may be supposed from this that the frontal bones of the sheep are very strong, and their bold convexity tends still further to their security. Still it might be thought that the powerful shock occasioned by the blow would affect the brain ; but this is not the case. If we were to judge of the brain of the sheep by the convexity of the frontal bones, viewed externally, we should be deceived in our estimation of its volume. The frontal bone is deceptive in this point of view : it is intended to protect the brain in the part most exposed to the reception of injury ; and between the brain and the surface of the frontal bones there is a great distance. The two tables or plates, an external and an internal plate, of which the frontal bones consist, are separated to a dis-

tance from each other. The inner table immediately covering the brain is thick, and between it and the external table is an extensive cavity, extending even far up into the bony cores of the horns (in horned sheep). This vast cavity is termed the *frontal sinus*. Now, it is reasonable to suppose, that the external table, forming as it were the roof of this extensive vault or sinus, would easily be broken in by a heavy blow. Not so; it is everywhere supported by pillars and walls, rising up from the thick inner table or floor, being thus divided into numerous cells or compartments. These walls and pillars, while they add little to weight, by their reception of the concussion along their perpendicular line, make the external table more strong, and capable of enduring a heavier shock than it would be were the two tables consolidated into one plate.

The annexed representation of a longitudinal vertical section of the skull of the sheep will show the character and extent of the frontal sinuses:—



SECTION OF SKULL.

- A D The nasal bone.
- B Upper maxillary bone.
- C Intermaxillary bone.
- H H The frontal sinuses, separating the two tables of the skull.
- G The frontal sinuses, extending up the bony core of the horns.
- H I The cerebrum, or large anterior portion of the brain.
- K The cerebellum.
- L The ethmoid bone; to the left of which is seen the thin, cribriform plate separating the nasal cavity from the brain.
- M The lower portions of the developed ethmoid bone.
- N The superior turbinated bone.
- O The inferior turbinated bone.
- P The sphenoid bone.

Having thus far explained the nature of the frontal sinuses, we may observe, that they are liable to invasion by a singular

intruder; namely, the larva of a fly of the Dipterous order, the gadfly of the sheep (*Æstrus ovis*). This fly is common, more especially in wooded districts, from May to July, and is as much the terror of the flock as its near relative, the *Æstrus bovis*, is of the herd; but it acts in a different manner. It endeavours to deposit its eggs within the *alæ*, or flaps of the nostrils, where, by reason of the warmth and moisture, they are very speedily vivified. The larvæ, or maggots, then small, begin to make their way into the nasal cavity, and ultimately trace their winding course into the frontal sinuses. The appearance of the fly occasions terror; but the larvæ, in their course through the nasal cavity, almost drive the sheep to distraction. They crawl along, by means of two small hooks or crotchets, which grow on each side of the mouth; and by these they fix themselves when they have arrived at their destined nidus—feeding upon the mucus secreted by the lining membrane of the chambers. In process of time the larva attains to the length of about an inch; it is somewhat flattened, and composed of eleven rings, edged with a few short bristles; between the rings, on the under surface, are small red spines, the points of which are directed backwards. These spines evidently assist in progression. In the spring the larvæ are becoming mature, and now begin to retrace their passage into the nasal cavity. This, again, throws the sheep into distraction. It stamps, it tosses its head about, it sneezes violently, and so continues till the maggot or maggots are expelled. Seldom, however, more than one or two, sometimes three, tenant the sinuses of a single sheep. After expulsion from the nostrils, these maggots are restless, and crawl about, till they bury themselves in the earth, and assume the pupa condition; and in six weeks or two months the perfect insect is disengaged from its pupa case, and is soon prepared to commence its incursions upon the flock.

The actual degree of mischief occasioned to the sheep by the presence of the larvæ of the *Æstrus ovis* is not very satisfactorily attained. Many writers describe it as amounting to convulsions, giddiness, and stupor; but may they not have confounded some true cerebral affection with the mere presence of these maggots? Be this as it may, it has been recommended to open the frontal sinuses by means of the trephine (an instrument for removing a portion of the bone); but look at the consequences. It may be (and the chance is even) that

the maggot is lodged within the core of one of the horns—nay, it may never have proceeded beyond the turbinated bones of the nasal cavity; and in these cases a severe operation will have been uselessly performed. That both the ascent and descent of the maggot occasions dreadful irritation, is certain. Every action of the sheep evinces it.

#### HYDATIDS IN THE BRAIN.

If the maggot of the *Æstrus ovis* be not, as the ancients imagined, bred in the brain, there is a parasite bred there far more formidable from the effects it produces than the sinus-haunting larva. We allude to the presence of those strange parasitic creatures which take up their nidus either upon the surface or within the very substance of the brain, termed hydatids.

A sheep labouring under this severe affliction is said, in the language of the farmer, to have the *turnsick*, the *giddy*, the *goggles*, the *sturdy*, the *dunt*, &c.; names bearing some allusion to the symptoms produced.

It is seldom in the second year, and rare after that age, that sheep are affected with this disease, the *sturdy* or *turnsick*, from the presence of these parasites. It appears principally in the first year, and oftenest during the first six months of the animal's existence, and is most prevalent in damp low situations, boggy districts, and in a cold wet spring, when the earth is drenched with chilling rains. It is then that some of the weaker lambs begin to exhibit strange symptoms, and others take their turn, first exhibiting the signs of debility.

At first the lamb seems dejected and dull, it foregoes its frolics, it cares not to associate with its companions, it mopes alone; soon its step becomes vacillating and unsteady, and it often staggers; sometimes it stands in a state of unconsciousness gazing with a stupid stare, then, as if some fearful object had started up, it flies off in terror, and at its utmost speed, stops again, and stares vacantly as before. Often it pores over the glassy water of a ditch or streamlet, till at last it reels giddily and sometimes falls in. All this time it eats little, it becomes meagre, its countenance is haggard, its eye vacant and of a singular blue colour,—a marked character of this affection.

These symptoms increase, the glassy water is more attractive, the fits of vacant abstraction and sudden terror

become more frequent, and there is a twist to one side in the animal's neck. Soon the sheep commences a rotatory motion in one direction, according to the twist of the neck; and, if it feed at all, goes round and round as it gathers the herbage. It is now that blindness begins to come on, surrounding objects are unseen, the rotatory motion increases, for an hour or more at a time the animal wheels round and round, it falls, it rises up, stands in vacant stupor, commences its rotations, and at length dies an emaciated frame; or falls into some brook, or down some steep place, and so perishes.

What are the appearances which on opening the skull will present themselves? Variable as to number and situation, in or upon the brain will be found these hydatids: sometimes they oppress the surface of the cerebrum under the pia mater; sometimes they occupy the middle scissure of the brain; sometimes they tenant the ventricles; sometimes the cerebellum. Some writers pretend to distinguish, by the peculiarity in the eccentric movements of the sheep, that portion of the brain in which the hydatid or hydatids may be lodged; and to a certain extent this may be possible, but the knowledge brings with it little practical advantage. Sometimes before death the brain of the sheep is almost wholly wasted away by the slowly-growing parasite, leading us to wonder how it is possible that life under such circumstances could have been at all protracted.

When the hydatid is located upon the surface of the brain, its gradual pressure upwards or outwardly, slight as it may be, produces an absorption of the bony surface of the skull itself, according to the spot beneath which it is lodged. In this spot, generally a little anterior to the root of the horn, the skull feels soft and yielding, and it is here that an operation may be performed with some chance of saving the sheep. The object of the operation is to remove or destroy the hydatid cyst. If the skull over the cyst be completely absorbed, a cross-wise incision may be made over the part, the flaps of skin turned back, and the hydatid exposed and removed altogether if possible. Should the bone be not absorbed, or freer access to the cyst required, the trephine may be used. It is important that the hydatid should be extracted whole, and this is by no means easy, sometimes impracticable; still the fluid must be removed, and afterwards the membrane of the cyst piecemeal, supposing that it has broken.

The French adopt a different plan: they merely puncture the cyst, at the spot where the skull is soft, with an awl, and place the sheep on its back, in order that as much of the fluid as possible may be discharged. This operation should be repeated every three or four days, with intervals of two days between each puncture. This operation is very simple, and more successful than any other.

Another operation in the case of hydatids in the brain has been recommended by Mr. Hogg. It consists in pushing a wire, or sharp and slender trochar, (taking a middle course) through the thin cribriform plate of the ethmoid bone into the brain, and so piercing the hydatid, the fluid of which escapes through the nostrils, or, if a trochar be used, through the canula. This operation Mr. Hogg states that he has performed many times with success. It is liable, however, to several objections. It is not easy to hit the cribriform plate of the ethmoid bone (see fig. at p. 99, L), and so enter the skull; and, granting that this be accomplished, except the hydatid be placed on the superior part of the brain it will not be punctured. There is, in fact, great uncertainty and danger in the operation: *uncertainty*, because the wire or trochar passes in one direction only, and consequently the greatest portion of the brain is out of its way: hence a hydatid deep in its surface, or in the cerebellum, cannot be attained; *danger*, because, although after the membranes and bones of the nose have been pierced, the sheep scarcely, if at all, feels the entrance of the wire into that portion of the brain through which it passes, still inflammation is greatly to be apprehended; and Mr. Hogg confesses that the sheep which die in consequence of wiring are in the greatest agonies, and utter piteous groans. Sometimes a sheep, when the wire pierces the brain, will drop as if felled by the stroke of a pole-axe, and expire in a couple of minutes.

The prevention of every disease is better than the cure; in this disease it is so most decidedly. But the question is, how is it to be prevented? By proper diet and air. Let the pasturage be well drained—let low humid cold spots be avoided—let the young lambs have proper shelter, and let care be taken of the ewes in the early part of the spring. It is advisable to let them have salt to lick, as is recommended by M. Giron de Buzaseinques. A weakly or feeble ewe will produce a weakly offspring. This disease is to be attributed to debility; for it is only in sickly feeble lambs that the hydatid will flourish.

Of various empirical modes of treatment in this disease—some of them brutal, as the application of branding irons to the skull, cutting off the ears of the animal, worrying the sheep by a dog, or chasing it till it is driven over some declivity, as the sides of a stone pit—we need not speak; they are disgraceful practices, and the ignorant alone will put faith in them.

#### HYDROCEPHALUS, OR WATER IN THE HEAD.

This disease, termed by some dropsy of the brain, goggles, &c., must be distinguished from the previous affection resulting from the presence of hydatids. It consists in an accumulation of serous fluid upon the surface of the brain, between the *pia mater* and the arachnoid coat; or within the brain itself, occupying the ventricles, and descending from the fifth ventricle even into the sheath of the *medulla oblongata*. The symptoms in this disease are more severe than in *sturdy* from hydatids, and its course is more rapid. It is, besides, mostly attended by some degree of paralysis, either in the fore or hind quarters; but the head is usually turned to one side. As in the human subject, *hydrocephalus* is sometimes *congenital*. The lamb is born with it, the head is enlarged; the bones soft, the sutures opened, and, in these cases, parturition is difficult; but the destruction of the lamb, essential perhaps to the safety of the mother, is of little moment.

In other cases, the disease comes on gradually. The lamb appears dull; it staggers a little as it walks; the bowels are constipated, sometimes violently relaxed; the appetite is variable, occasionally voracious, at other times lost; the animal now pines, and becomes thin; the skull enlarges; the stupidity increases, and the vital powers gradually sink.

Hydrocephalus may be regarded as incurable. It is not unfrequently accompanied by one or more hydatids, and in such a case all hope is out of the question.

The causes of this disease must be referred to constitutional weakness; sometimes arising from bad management of the flock, sometimes from a peculiar predisposition inherited from one or both of the parents solely. In the latter case, the sooner the farmer can change his stock or introduce new blood into it the better; in the former case, he must alter his system of management, and attend to the health of his breeding ewes. Generally, however, we think that hy-

drocephalus results from an inherited predisposition; and that slight exciting causes will induce its commencement where the tendency to it exists.

#### APOPLEXY, OR BLOOD-STRIKING.

This disease, which consists in a sudden and violent rush of blood to the vessels of the brain, producing extreme pressure and almost instant death, is very common among sheep. Sheep which are highly fed, and particularly such as are prepared for exhibition, are especially subject to it. Such animals should be narrowly watched, for the disease gives little warning, and all is soon over. Suddenly a sheep stands motionless, it staggers, it sees nothing, the eyes are fixed, the pupils dilated, the conjunctiva and the membranes of the nose are purple with blood or fiery red, the nostrils are dilated, the flanks heave, the breathing is stertorous, the animal reels, falls, and dies. Sheep fed up to a high degree of plethora, and then driven or excited, are in imminent danger. The heart beats quickly and strongly, the blood rushes in double tides through the arteries, the brain receives a volume which it is unable to bear, the animal is distressed, it lags behind the flock, half stupid and half blind, and suddenly it falls. Probably all hope of saving it is now lost, and what must be done should have been done previously, when the symptoms first manifested themselves. About a pound of blood must be taken from the jugular or neck vein—not the slow-bleeding eye vein—and afterwards a smart purgative must be administered, consisting of Epsom salts in a four-ounce dose, to be repeated in ounce doses every four or six hours, until the medicine operates. Should these means happily succeed, the sheep must be placed upon scanty fare, and its plethoric condition reduced. After this let it be gradually prepared for the butcher, for one attack is too often the forerunner of others. Sometimes apoplectic symptoms, instead of suddenly producing death, terminate in inflammation of the brain, which is fatal in the course of a short time. Sheep fed on the rich pastures of Leicestershire, Romney Marsh, and other places where the soil is rich and the spring herbage luxuriant, are very liable to apoplexy, especially if the weather prove hot. A clover pasture is dangerous.

#### INFLAMMATION OF THE BRAIN, OR PHRENITIS.

Inflammation of the substance of the brain, or of its mem-

branes, is produced by the same causes which occasion apoplexy. In this disease the vessels of the brain, or of its membranes, are gorged with blood; but not to such a degree of turgescence as to occasion sudden death, either from this cause or from the rupture of some vessel and effusion of blood.

In the first stage the sheep is dull, heavy, disinclined to move or to eat, and the eyes are bloodshot and staring; but the second stage soon comes on. The aspect of the countenance becomes wild, the animal gallops frantically about, rushes to the attack of its companions or of any person or object that happens to attract its notice, and evidently labours under furious delirium. Sometimes it dashes itself on the ground, and ultimately, in the midst of its violent efforts, staggers, falls, and dies, perhaps from the rupture of some blood-vessel on the brain.

Occasionally a whole flock, too suddenly removed from a very spare summer pasturage to a field of rich turnips, has been known to become affected altogether with phrenitis, to the great loss of the farmer.

This disease occurs more frequently among lambs than sheep, and they leap and dash themselves about in the wildest frenzy.

With regard to the treatment in phrenitis, it may be summed up in a few words. Copious bleeding from the neck vein (jugular), followed by doses of Epsom salts, are the means employed, and the more promptly the better. Should these measures succeed, a sparing diet will be necessary, in order to prevent a recurrence of the disease.

#### RABIES, OR MADNESS.

The strange ferocity which sheep exhibit in phrenitis often leads the farmer to suspect that the poor animal is labouring under *rabies* from the bite of a rabid dog, and indeed rabid sheep often exhibit great ferocity; but there are symptoms which distinguish between the two diseases.

Rabies but too frequently occurs in flocks; a village cur or a sheep-dog becomes rabid, and in this condition prowls about bent on mischief; it enters the fold, it bites most of the sheep more or less seriously, more or less frequently; retreats—perhaps returns to the farm or village; is recognised as being *mad*, and soon destroyed. The farmer visits his fold, he finds all in great disorder, the sheep panting, ter-

rified, and exhausted : he soon sees that they have been bitten and lacerated, and his suspicions are excited, perhaps confirmed, by the report of the destruction of a mad dog half a mile from the spot. What is to be done ? The sheep must be carefully examined one by one. If the sheep have not been clipped the wounds will be about the face, lips, ears, and legs, for the deep wool will defend the body ; but if the sheep are denuded of this covering, various parts of the body, as the sides, shoulders, thighs, &c., may be lacerated. Each wound should be thoroughly burnt by lunar caustic (nitrate of silver), of which a pencil should be formed capable of being inserted into every part ; to effect the purpose decidedly, the wound, if necessary, should be enlarged by the knife, for unless the caustic have free access to the very depths of the wound, and cauterizes it thoroughly, there is no chance of saving the animal. Supposing this to be done, still the farmer will have to wait the result with anxiety—it is not always easy to determine that the wounds have been cauterized to their very depth ; some slight puncture, moreover, may have escaped notice, and the system may have absorbed the poison before the application of the caustic. All, then, remains in uncertainty. If the disease lurks in the system, its symptoms may be expected to manifest themselves in the course of a fortnight, and from that time to the end of eight, ten, or even twelve weeks. At first the sheep display a tendency to annoy and chase each other ; they cease to feed as usual, and begin to lose flesh. In the course of a day or two a strange stupor supervenes, especially in the case of the ewes, which soon become paralyzed and die, often without a struggle. It has been observed that the lambs fall into a succession of convulsive fits, which in the course of two or three days end in death. The rams and wethers are generally affected in a somewhat different manner (as are sometimes also the ewes). They push their heads against the ground, against the bank-side or palings ; and often, though they show no disposition to bite, use their horns or heads in striking each other with great violence, or run full butt against any object, repeating their blows till the skin is stripped from their foreheads. There is a profuse discharge of mucus from the nostrils, and of a frothy saliva from the mouth, but they exhibit no dread of water, nor do they seem to be tormented by insatiable thirst. They drink from the dirtiest puddles by preference. They eat mud and earth, nibble sticks or bits of wood, and

swallow the portions; in their paroxysms of delirium they utter a peculiar kind of bleat in a high key, and with a strangely plaintive or wild wailing expression, and soon become paralyzed or torpid, occasionally convulsed, and die. Death generally takes place on the second or third day after the manifestation of the disease, but some survive even to the fifth.

#### LOCKED JAW, OR TETANUS.

This disease occasionally attacks sheep, and is usually produced by cold sleety rains, and severe weather, especially at lambing time. From the same causes, the young lambs themselves are still more subject to it, but in the young males another cause is apt to produce it, viz., the operation which they are doomed to undergo, and which is generally roughly performed, so as to give more than necessary pain, producing spasmodic contraction of the muscles generally, but particularly those of the jaws, which become strongly clenched.

In ordinary cases the symptoms are as follows: At first there is a peculiar spasmodic twitching of the head or of some of the limbs, a grinding of the teeth, and a rigidity of the jaws. In a few hours these symptoms increase, the frame generally becomes stiff, the neck is protruded, the head bent back, and as it were fixed; one of the limbs, moreover, is rigidly contracted, and the muscular frame in general is spasmodically stiffened. Occasionally convulsive paroxysms intervene between fits of rigid spasm, and in ten or twelve hours the animal dies. Occasionally, however, the affection, though continuing longer, even to thirty-six hours, gradually subsides, the vigour of the constitution ultimately triumphing.

The treatment must consist in shelter or warmth, bleeding, purgatives, and opiates. Blood must be abstracted according to the age and strength of the animal; it should be placed in a genial temperature, and then undergo the action of aperients combined with opium. Castor oil, in doses of two ounces, with laudanum (tinct. opii) 1 drachm or  $1\frac{1}{2}$  drachm, in gruel may be given to an adult sheep, and the castor oil or olive oil repeated, in smaller doses, every two or three hours until the desired effect is produced. After this, a cordial drink, consisting of gruel, ginger, and good ale, or a little gin, will often complete a cure. The fact is, that tetanus in the sheep is not so unmanageable or fatal as in the horse, or even in the ox; and in lambs undergoing the operation

alluded to, the very circumstance of forcing open the jaws with the thumb, or of preventing their contraction by its introduction at the time, will prevent the muscular system generally from sympathizing with the muscles of the jaws—the latter being, as it were, the incitements to a similar spasmodic action throughout the frame.

Tetanus is a disease which ought very seldom to appear in sheep; it is the farmer's fault if it attacks his flock. The yearning ewes and young lambs should have due and sufficient shelter, and it is to be observed that it occurs chiefly among sheep and lambs exposed to the depressing cold of bleak unsheltered commons or heaths, during the early months of spring, or the middle of winter.

#### EPILEPSY.

A disturbance of the action of the nerves (we must not here agitate the point with respect to this action, be it galvanic, or what it may) will often produce epileptic fits—the *morbus sacer* of the ancients.

Sheep are not unfrequently the subjects of epilepsy. It generally occurs within a few hours after daybreak, when the morning is fine but cold, principally in the spring and early part of the summer, and again in the autumn. The sheep rising from its bed (perhaps the grass of the field being covered with hoar-frost) begins to stare, and stagger, and then falls, and struggles convulsively for several minutes. By degrees the fit subsides, and the animal recovers its feet, but still remains for some time in a state of semi-consciousness which gradually abates, and the faculties regain their usual equilibrium. These fits may recur every day, and if so, a fatal termination may be predicted.

In some parts of the country the mode adopted in order to check the accession of the fit is to set a dog upon the semi-conscious animal, the worry of which, as has been remarked, frightens the creature not out of its senses, but into them. The terror excited interrupts the progress of one kind of nervous derangement by setting up another; but it is a cruel plan.

We recommend change of pasture, shelter, and a few doses of purgative medicine. When, however, habit has confirmed the disease, little hope of cure is to be entertained; the sheep wastes in flesh, however plump it might have been previously, and ultimately sinks, or dies apoplectic.

## PALSY, OR PARALYSIS.

Palsy, or paralysis, consists in a more or less complete suspension of the nervous influence on the muscles of voluntary motion. It may arise from many causes which exert a morbid influence on the nerves of motion, and it may vary in extent, from loss of power in a single muscle, to those of the limbs, or of the whole body.

If the palsy of the limbs be complete, the animal rarely recovers, although it may, perhaps, drag on existence for a longer or shorter time. In other cases the muscles slowly regain a degree of power; but if they do, rheumatism too frequently supervenes, and the animal wastes away, and ultimately sinks.

In complete palsy, there is, as we have said, little hope of cure; but in milder cases relief, at least, may be afforded. The helpless animal should be removed to a comfortable shelter, and bedded upon straw; a small quantity of warm gruel, with some ginger, or a little ale, may be administered, but more exciting stimulants will do mischief. Gradual restoration of temperature, and a gradual return of the nerves to their wonted functions, are the points to be aimed at. The lambs should be housed, their limbs rubbed at some distance from a fire, and warm gruel given to them. Should they recover the use of their limbs, they should be restored immediately to their respective parents, under shelter. It is, however, seldom that the lamb regains its due state of health and condition, and is therefore the more liable to the attacks of other diseases; indeed, severe diarrhoea too often ensues, which is not to be arrested without difficulty. A cordial astringent, commonly known as "Calves' and Sheep's Cordial," will be found useful. It may be prepared as follows:—

Take of

Prepared chalk, 1 oz.  
 Powdered catechu,  $\frac{1}{2}$  oz.  
 Powdered ginger, 2 drachms.  
 Powdered opium,  $\frac{1}{2}$  drachm.  
 Peppermint water,  $\frac{1}{2}$  pint.

Mix well. Dose from one to two table-spoonfuls twice a-day. The mixture to be shaken each time it is to be administered. A little gum arabic, or mucilage, will tend to keep the chalk in some degree of suspension, but it is not absolutely necessary.

## FEVER.

As is the case with horned cattle, sheep are liable to attacks of fever, and from the same causes. The first symptoms which attract notice are dulness, an indisposition to take food, a desire to rest alone, apart from the flock, in some sheltered or cool place, a weary gait, a distressed expression, panting of the flanks, a hurried breathing on being driven, redness of the eye, and dryness of the mouth. These symptoms are preceded by shivering, and if the disease be not speedily checked, it runs on into inflammatory fever; or the lungs, or some vital organ, will take on active inflammation, and all attempts to save the animal will be in vain. Many sheep, but more lambs, are yearly lost, in consequence of neglecting this disease, until it has assumed a violent character.

The first thing to be done is to remove the animal from the field to some quiet place, and then abstract a moderate quantity of blood, according to age, size, and strength; a dose of Epsom salts,—two ounces for a grown-up sheep, dissolved in water or thin gruel,—may be then administered, and repeated in a smaller quantity, after the lapse of a few hours, till it takes the proper effect. All stimulating or cordial drinks are poison here.

Should the animal improve, its diet must be cautiously attended to. It must not be put upon rich and nutritious food, as clover, turnips, and the like, but allowed the range of a scanty pasturage till its health is re-established. Even then, its return to fattening diet should be gradual.

## INFLAMMATORY FEVER.

This fever is similar to the *quarter-ill* of young cattle, and is called by some *blood-striking*,—a term also given to apoplexy; and, indeed, it is in apoplexy that this fever terminates so frequently.

It is generally while feeding in rich pastures, such as Romney Marsh, when the herbage is luxuriant and full of spring sap, that sheep are attacked by this disease; and the more liable to it are they if, during the winter, they are fed on scanty fare. The system will not bear the sudden change from starvation to luxury; and the slightest exciting cause, like a spark falling upon gunpowder, causes the explosion.

This disease commences with violent shivering, of short

duration, succeeded by a hot paroxysm of proportionate severity. The animal is languid, and refuses food; it pants, if driven, and lies down as soon as possible. Sometimes it becomes restless; its eyes are wild and bloodshot; delirium supervenes, followed by stupor; it lies down, resting the nose on the ground; the ears hang down; the eyes are closed, and never again opened; the animal dies without a struggle. The disease runs a rapid course: a sheep may appear well in the evening, and be found dead in the morning; but generally its period averages from sixteen to twenty-four hours. The urine is small in quantity, and bloody, and there is violent strangury. Sometimes, instead of sinking into a gradual torpor, the animal drops suddenly dead.

As this fever depends upon repletion of the blood-vessels, brought on by too sudden a change from low to rich fare, the main chance of saving life will be by the prompt abstraction of blood in an early stage, before any congestion of the brain or of any of the viscera of the chest or abdomen, has taken place; afterwards, active purgatives must be given, and the pasturage changed. There must be no delay—a quarter of an hour may make all the difference.

#### BRAXY—TYPHUS FEVER OF YOUATT.

A highly febrile condition, depending upon the acute inflammation of some of the viscera, often rapidly assumes a typhoid form. Hence Mr. Youatt terms it *typhus fever*, and he rightly observes, that it is common in Scotland, where, with other similar diseases, it has the general appellation of braxy. This term, the true meaning of which is not very palpable, is, as we have said, applied to several inflammatory affections. *Water braxy*, for example, is inflammation of the serous membranes of the abdomen, ending in the effusion of bloody serum. *Dry braxy* is inflammation of the mucous membrane of the stomach and bowels, and is very rapid in its progress, often destroying life within a few hours of the symptoms being observed, so suddenly does the inflammatory action prostrate the vital powers, so quickly do the typhoid symptoms succeed those of burning fever. This is the *typhus fever* of Youatt. It is most prevalent in autumn, as the food becomes scanty, and the sheep resort to dry, harsh, and indigestible aliment, at the same time that they are exposed to cold and wet, bleak winds, and driving sleets. Mr. Spooner says, that *dry braxy* is produced often by rank grass and rotten

leaves. The symptoms, he says, are a quick pulse, hurried breathing, the mouth and skin hot, the wool clapped, the belly sometimes swelled, and the bowels confined.

Prevention is here important; and the rules laid down by Mr. Hogg, in his *Mountain Shepherd's Manual*, are well worthy of attention, especially by the Scottish sheep-farmer, among whose flocks the disease is most prevalent; many of the observations, indeed, are generally applicable.

To obviate the causes of this disease, it may, he says, "be probably advisable to smear the hogs a month or six weeks earlier than the rest of the flock. This will operate in two ways—first, it will defend the animal from wet and cold; and next, the irritation excited in the skin by the smearing stuff, if containing tar or turpentine, contributes to remove any tendency to inflammation from the internal parts. This is a circumstance perfectly understood by medical men, who in ordinary practice apply stimulating matters to the skin for this purpose; and it is in this way that blisters act."

With respect to the mode of cure, in this disease, unless remedial measures be resorted to in the early stage, there is no hope. The lancet and Epsom salts are the chief dependences: blood must be taken, and purgatives administered without unnecessary delay. Mr. Hogg, in the *Manual*, quotes some cases forwarded to him by Mr. Stephenson, a surgeon, in some of which his mode of treatment proved successful; out of twenty-five cases, sixteen recovered, nine died. His plan was to bleed by free incisions across the tail, in the eye-vein, in the jugular, in the limbs, or, in fact, wherever blood could be obtained; after this, Glauber salts (1½ ounce) were given in warm water; and where these could not be obtained, a handful of salt, by means of the spout of a common tea-pot. The diet consisted of meal and water, and boiled hay.

#### WATER BRAXY, ACUTE DROPSY, OR REDWATER.

This disease is essentially inflammation of the serous membranes of the abdomen, or chest, or of both, terminating speedily in effusion and death. From the colour of the serous effusion, which is stained with blood, it has obtained the name of *redwater*. Lambs are particularly liable to its attack, and most so in the autumn and early part of winter, and also soon after they are yeaned, especially during cold wet weather, and in damp situations. Sheep when first put upon turnips are also subject to it, and so rapid is its pro-

gress, that a sheep exhibiting nothing wrong in the evening, may be found lying dead, in the natural attitude of sleep, when the shepherd visits his charge in the morning.

It is not always, however, that the course of this disease is so rapid, or that no precursory symptoms are manifested. It frequently happens that a sheep indicates by its actions that this disease is commencing. It is dull and listless, it lags behind its companions, it stands with its head stretched out, and its flanks tucked up, as if labouring under great pain; its breathing is difficult, sometimes the bowels are constipated, at others unnaturally purged. Soon the abdomen begins to swell—the animal evinces its great uneasiness by repeatedly lying down and getting up, or by rolling on the ground; the effusion proceeds, the breathing is laborious, and soon ceases.

It is only at the commencement of this disease that there is any chance of success. Bleeding, followed up by aperients, warm fomentations to the abdomen, and shelter from cold, with a change of food, are the means to be resorted to. It must be confessed that the chances of cure are very slight, and it is perhaps the farmer's best plan, on the first appearance of the symptoms of acute dropsy, to slaughter the animal at once. These symptoms, however, are obscure, they are not readily to be distinguished from those of other inflammatory diseases, particularly at their commencement; but when one sheep in the flock has died, and of this disease, as ascertained by examination after death, the farmer may be pretty sure that others will follow, and should watch diligently, and save the flesh of the sheep or lamb, by immediate slaughter. At the same time, let him change the situation and diet of the flock, and give them shelter.

Acute dropsy, as it may well be termed, must not be confounded with that species of dropsy which is the consequence of general debility, or the result of chronic or slow and insidious diseases—as inflammation of the liver, chronic *enteritis*, and even of old age itself. In these cases, there is not only abdominal dropsy, but the skin of the jaws and legs becomes anasarcaous, indicative of the failure of the vital energy of the system. We know not that anything can be done in such cases; it will be right to keep up a moderate action of the bowels, and administer tonics, as gentian and ginger. Some have recommended tapping by means of a trochar, but we place no faith in any medicines or in any operation.

## COLIC

Colic is a spasmodic, not an inflammatory disease, but we here advert to it, as it has to be distinguished from *enteritis* or inflammation of the bowels. It is rare in adult sheep, but in the winter house-lamb over-crammed with milk, and in the grass-fed lamb liable to crop rank or acrid herbage, it is not unfrequent. The lamb moans, is restless, strikes at the sides of the belly with its hind feet, and seems distressed with pain. An aromatic purgative, composed of an ounce of Epsom or Glauber salts, with two scruples of ginger, and thirty drops of laudanum, may be made up into a drench with good peppermint water, and given as soon as possible. Soon after this warm gruel should be administered; and if in a few hours the bowels are not relieved, the aperient drench should be repeated. In the meantime, the bowels should be fomented and the animal kept comfortably warm. Strangulation of the intestines from violent spasmodic action, or intussusception, have, we believe, never been observed in the sheep.

## ENTERITIS, OR INFLAMMATION OF THE BOWELS.

Sheep, owing to cold, wet, improper food, and other causes, are liable to inflammation of the bowels, or rather of the peritoneal coat of the intestines, which, if not relieved, will terminate fatally. The symptoms are—shivering, fever, a small quick hard pulse, obstinate constipation, and violent agony. The animal stamps, it strikes its sides with its hind feet, it paws the ground, it attempts to lie down, but the pain produced on the attempt renders it irresolute or checks it; perhaps in despair it throws itself down, then rolls on its back, again scrambles up with a violent and painful effort, and looks wild and distracted. Gradually it begins to waste away, and soon dies. Occasionally it becomes delirious, the pupil is widely dilated, and the brain is evidently in a state of congestion.

Prompt and active treatment in the early stage is imperatively demanded. This consists in the abstraction of blood according to the strength of the sheep, and in the persevering administration of purgatives until the bowels act freely. When this is effected by Epsom salts, their action may be kept up by sulphur in ounce doses. The food should consist of mashes and gruel. Fomentations are useful. As soon as

the bowels begin to act freely, a grain or two of opium in gruel will be advisable, as tending, by mitigating the pain, to subdue the violence of the inflammation.

#### DIARRHŒA.

By diarrhœa we mean simple purging, arising either from a relaxed state of the mucous membrane of the alimentary canal, or from the presence of some acrid or irritating matter in the bowels, which nature thus makes an effort to get rid of. Many persons confound diarrhœa with dysentery; and it is true that the former, from the persistence of irritation, may run into the latter, but dysentery commences as a febrile disease with inflammation.

Diarrhœa should never be neglected. It either indicates debility or improper food, and in lambs often terminates fatally, beginning as simple purging, but ending in serious disease of the mucous membrane. It arises from cold, from acrid food, as rank grass, or even from an unhealthy condition of the parent's milk. It is common at weaning time. Now the farmer must not be alarmed when he finds his lambs simply purged; because, as we have said, it is often nature's own remedy; but he should watch them, and if it becomes immoderate, continues beyond twenty-four hours, is attended by griping pains and a discharge of mucus, he should immediately take steps to allay it. Change of food is one step, warmth and shelter another, and doses of the mixture termed "Sheep and Calves' Cordial" will mostly prove beneficial. A weaning lamb should not be put incautiously upon rich succulent grass, for such diet may not only produce diarrhœa, but other diseases; and when from this cause diarrhœa supervenes, the removal to a paddock or field of close-cropped herbage on a dry soil is essential. In suckling lambs, it is perhaps advisable to remove them from the ewes, and substitute boiled cow's milk for that of the natural mother, the doses of cordial being given once or twice a-day.

With respect to full-grown sheep, the same observations relative to pasture will apply. Diarrhœa is a spring affection, generally speaking, occasioned by the new succulent grass, and need not, unless severe, be checked; but if severe or continuous, then the change of pasturage is necessary. Hogg says, "Purging seldom proves fatal to sheep. It is sometimes of service to their general health, and ought never

to be stopped too soon. But this complaint sometimes proceeds so far as to bring on great debility if its violence be not checked. When the flux is moderate, change of diet from soft to dry food for a few days may effect a cure; but if the purging be considerable, a quarter of an ounce of prepared chalk may be given in an English pint of cow's milk, a little warmed. The dose may be repeated at the end of two days, if symptoms of amendment have not appeared. If the purging be very violent, and attended by straining, the first dose should be a drachm of rhubarb, and, after it has operated, chalk may be given. When cured, the animal must be gradually accustomed to its pasture, otherwise the rich tender grass may occasion a relapse."

In addition to the chalk, it may be well to give with it a grain or two of opium.

#### DYSENTERY.

Dysentery consists in inflammation of the mucous membrane of the intestines, producing not only an increased secretion of mucus, but a morbid alteration in its character; and, consequently, it differs essentially from diarrhœa, which is a natural effort to relieve the bowels of irritating matter.

Nevertheless, dysentery often commences insidiously; it may result from neglected diarrhœa, but it oftener commences as dysentery from the first, and so runs its course. It is produced by cold, bad food, neglect, and ill-management. It begins by febrile symptoms and purging, quickly inducing emaciation. Generally the appetite fails, but occasionally there is a morbid desire for food, to the digestion of which the stomach is unequal. The alimentary discharge is thin, slimy, adhesive, bloody, and offensive, often intermixed with hard lumps. The abdomen is tender, even painful. The countenance is distressed, the back of the thighs are plastered by coatings of the slimy evacuation; the animal pines, its flesh wastes away, and it becomes a piteous object. Some cases terminate fatally in a few days, in others the wretched creature wears on for three or four weeks before death terminates its sufferings.

In the treatment of this disease much caution is required, and at the same time the plan ought to be decided. If there be considerable fever—and in the early stage the febrile action is generally considerable—blood ought to be abstracted

according to the strength of the sheep; then, strange as it may seem, aperient medicine should be administered, for the bowels must be unloaded of their offensive morbid secretion. A good aperient in this case may be made up as follows:—

Linseed or castor oil, 2 oz.  
Powdered opium, 2 grains.  
Linseed tea,  $\frac{1}{2}$  pint.  
Mix.

Some prefer half a drachm of rhubarb, an excellent medicine, as it acts, in a secondary way, as a tonic and astringent; others give salts, but a combination of these with rhubarb would be preferable.

In the meantime, the animal must be put upon a diet of mash, gruel, and a little hay.

Suppose the medicine to have acted (clearing the bowels of their disordered contents), and the fever to be abated, what is the next step? Gentle astringents with opium. Among these, the "Sheeps' Cordial" is one of the best preparations, and afterwards, as a restorative, doses of gentian and ginger may be given.

Before, however, astringents are given, it may be necessary, —the fever continuing— to keep up the now *natural* action of the bowels; for this purpose, ipecacuanha, in doses of five or six grains, has been found very efficacious. Some practitioners however give sedatives, and follow them by oleaginous aperients.

Mr. D. Sayer, in some cases which came under his experience, as quoted by Mr. Spooner, after administering an oleaginous purgative, gave on the following day the subjoined mixture:—

Powdered opium, 2 grains.  
Powdered ginger,  $\frac{1}{2}$  drachm.  
Powdered gentian,  $\frac{1}{2}$  drachm.  
Linseed tea, a small quantity.  
Mix.

This was administered twice. On the subsequent day it was repeated once, with the addition of half an ounce of linseed-oil. The plan was persevered in for a few days with the best results. By these means he succeeded in restoring many sheep, which gradually returned to their former diet.

## THE ROT, AND INFLAMMATION OF THE LIVER.

Sheep are subject both to acute and chronic inflammation of the liver, and this inflammation is in its simple state not only often fatal, but it is too frequently the foundation of that destructive pestilence—the rot.

Excess of nourishing food, undrained marshy ground (*saline* marshes excepted), and causes not easily understood, produce inflammation of this viscus. In acute inflammation there are decided febrile symptoms; the sheep is dull, it hangs its head, it is unwilling to stir, it heaves at the flank, and the bowels are usually confined. The skin assumes a yellow tinge, the eye is suffused with the same colour, and particularly the caruncle or small glandular body at the corner of the eye. The animal when pressed on the right side shrinks with pain, and the right fore-leg exhibits a peculiar lameness. If this disease be neglected it may run a rapid course, and end speedily in death; but it may assume a chronic form, and produce slowly or more quickly extensive disorganization of the substance of the liver, and the numerous evils attendant thereupon, and this we regard as the *rot*.

There would seem to be a peculiar tendency to inflammatory and morbid action in the liver of the sheep;\* indeed inflammation sometimes appears as an epidemic, especially in certain parts of France and Holland, where salt is given, both by way of prevention and cure.

The treatment of acute inflammation of the liver consists in bleeding, saline aperients, a spare diet on dry food or short grass, removal from luxuriant pasturage, and salt to lick.

With respect to that low, chronic, insidious inflammation which produces rot, we shall be able better to understand it, by treating it under that head.

Rot is a disease which not only ravages the flocks of our island, but those also of France, Holland, Germany, Norway, North America, and even Australia and Van Diemen's Land. It has been known from the earliest times, and history recounts the ruinous destruction which it has made from time to time among the sheep of various countries. Mr. Youatt

\* The liver of the sheep is proportionally larger than that of the ox, and double the proportionate size of that of the human being.

calculates that in our country more than one million of sheep and lambs die every year from this disease. "In the winter of 1830-31, this number was far more than doubled, and had the pestilence committed the same ravages throughout the kingdom which it did in a few of the midland, eastern, or southern counties, the breed of sheep would have been in a manner extirpated."

This horrible malady, the rot, comes on insidiously—the first symptoms are obscure; the sheep feeds, and what is more, rapidly gains flesh; nevertheless, it is dull, and this circumstance excites the suspicions of the experienced farmer. He looks at the skin of the animal, and especially on the brisket; he finds it, instead of being of a clear pinky colour, of a pallid yellow tint. He looks at the eye; the fine vessels seem injected with a yellow fluid, and the caruncle, which ought to be red, is of a yellow colour also. There is no doubt about the matter, the sheep has the rot—the liver is diseased, the bile is absorbed into the system, and is beginning to mingle with the blood.

Though, at first, probably from the stimulating effects of the bile on the system, the sheep rapidly accumulates fat,\* this state of things cannot and does not last. In a short time the sheep begins to lose flesh, and quite as rapidly as he gained it; the yellow tinge of the skin and eyes is more decided, it spreads over the muzzle, and dyes the fevered tongue; soon the muzzle, the tongue, and the eyes become of a livid yellow, and the breath is disgustingly offensive; sometimes excessive diarrhœa prevails, sometimes, on the contrary, the bowels cease to act, livid spots or patches appear on the skin, it hangs loose and flabby on the emaciated frame, and air becomes infiltrated into its cellular tissue—it crackles when handled; the wool falls off, or is disengaged with the slightest force, the abdomen begins to be filled with a serous effusion; dropsy is coming on, the skin about the jaws and throat

\* This was well known to Mr. Bakewell, for when he wanted to prepare sheep rapidly for the market, he used to overflow some of his pastures, and when the water was run off, to turn the sheep upon them. They speedily became rotted, and at the same time accumulated fat with wonderful rapidity. By this manœuvre he would gain five or six weeks on his neighbours. How far he was justified in this plan is another matter. We think he was not. But a person who relishes the diseased livers of geese in pastry, *pâtés de foie gras*, cannot object to the flesh of a jaundiced sheep, with pale flabby muscular fibres, and greasy yellow fat.

is filled with serum, the animal trembles in every limb, it is wasted to a skeleton, and so dies.

With respect to the duration of this disease, it varies from two to four, and sometimes even six months.

When a rotted sheep is examined after death, the whole cellular tissue is found to be infiltrated, and a yellow serous fluid everywhere follows the knife. The muscles are soft and flabby; they have the appearance of being macerated (soaked in water). The kidneys are pale, flaccid, and infiltrated; the mesenteric glands enlarged and engorged with yellow serous fluid. The belly is frequently filled with water or purulent matter. The peritoneum is everywhere thickened, and the bowels adhere together by means of an unnatural growth. The heart is enlarged and softened, and the lungs are filled with tubercles. The principal alterations of structure are in the liver. It is pale, livid, and broken down with the slightest pressure; and on being boiled it will almost dissolve away. When the liver is not pale, it is often curiously spotted. In some cases it is speckled like the back of a toad, nevertheless, some parts of it are hard and schirrous; others are ulcerated, and the biliary ducts are filled with *flukes* (*Distoma hepaticum*, Rudolphi; *Fasciola hepatica*, Linn.). Here is the decided seat of the disease, and it is here that the nature of the malady is to be learned. *It is inflammation of the liver.* In consequence of this, the secretion from the liver is increased, at first scarcely vitiated, and the digestive powers are rendered more energetic, but soon the bile flows so abundantly, that it is taken into the system, and the eye, the brisket, and the mouth become yellow. As the disease proceeds the liver becomes disorganized, and its secretion more vitiated and even poisonous; then follows a total derangement of the digestive powers. The whole system sympathises; every viscus of the chest and abdomen is gradually involved, and the animal exhibits at its death a general state of disorganization which accompanies scarcely any other malady.

Not only does the liver evince the ravages of inflammatory action, but also of the thousands of *flukes* or parasitic worms which crowd its ducts.

It is principally, if not always, in wet, boggy, or marshy districts that the flocks become diseased with rot. On lands from which the water drains rapidly, and on sandy soils, the disease is little known. They may graze with impunity along

the brink of a flowing river, or on the borders of a lake or sheet of water; but let that sheet of water become drained, yet not dried thoroughly up—let the decomposition of vegetable matter go on in the slime or ooze, and then let the sheep feed on its borders, not one will escape. Let a meadow with a tenacious subsoil be flooded, and the water drained off, and let sheep be turned upon it while the ground is so soft that it takes the impress of their footsteps, and rot will mark each animal. It is not from the water that they suffer; it is from the evaporation of it, and the exhalation of miasmata from vegetable matters in a state of humid decomposition. Hence it is that on dry declivities rot never appears, while it is perilous to turn sheep, even for a few minutes, into a neighbouring spot where water always lodges, and where vegetable decomposition is ever going on. But let this spot be flooded by a deluge which converts the upper lands into mire, then this flooded land, as long as it remains, though it may drown the sheep, it will not rot them; while on the upper miry land they will be all affected. The action of the sun and air on the putrescent matters is requisite for the communication of the disease.

During seasons of frost, when the ground is hardened, sheep may be turned with impunity upon spots notorious at other times for the production of this disease. The reason is obvious: no evaporation takes place, the ground is locked up; but let a warm thaw take place—let the sun and air draw up the miasmata of the dead and decaying herbage, and every sheep will be infected.

The drainage of land is very important, but with respect to sheep even drained land may be peculiarly fatal; it is drained, perhaps, sufficiently for agricultural purposes, but not for sheep: it retains water after rain, and is covered with little puddles from which pestilential evaporation is ever going on, and the farmer suffers great loss. Nothing is more important than the thorough and complete drainage of a sheep farm; half-measures are not only useless, but constitute one mode of throwing money away.

With respect to any benefit arising from the employment of medicine in rot, when it is fairly established, we are not very sanguine, but in the earlier stages of the disease, before the disorganization of the liver has proceeded too far, some good may be done.

In the first place, the loss of a few ounces of blood is

advisable, to which a few doses of Epsom salts may succeed, after proper intervals of two or three days. Immediate change of diet is imperative; hay, straw, or chaff should be substituted for green food, and salt liberally given; salt should be ever within their reach, and if salt-marshes are accessible let the flock be transported there immediately. But salt the sheep must have. It may be mingled with the hay, it may be given morning and night in doses of two or three drachms, and when the inflammation has subsided, it may be mixed with powdered gentian and ginger. Salt "is a purgative inferior to few when given in a full dose, and it is a tonic as well as a purgative. Its first power is exerted on the digestive organs, on the stomach and intestines, augmenting the secretions and quickening the energies of each. It is the stimulus which nature herself points out, for, in moderate quantities, and mingled with the food, men and beasts are fond of it." But furthermore, supposing the yellow tinge of the skin and eyes still continues, can nothing more be done? Certainly: mercury must be resorted to, but with due caution. Some advise friction with mercurial ointment over the region of the liver; but there is danger of inducing sudden salivation, under which the constitution will give way. It will be far better to administer a small dose of calomel daily, say two or three grains, with a grain or a grain and a half of opium, than to have recourse to mercurial ointment. The union of the opium with the calomel neutralises its irritating effects, and secures its action upon the liver, &c. Should the sheep recover under the treatment, the farmer's care will be to place them out of danger of a second attack. He must locate them on the driest and healthiest part of his farm, allow them a portion at least of dry provender, and place an unlimited supply of salt (rock salt) within their reach.

And here we would add, that if necessity constrain the farmer to turn his sheep into suspicious pastures, it will be well to supply them with this preservative; indeed, at all times it is beneficial; it is essential to the health of all cattle, and its free use might go far to check the ravages of the rot.

As to whether the farmer should sell off his sheep while in high condition as to fat when the first signs of rot appear, must depend upon many circumstances—the state of the market, his facilities for getting rid of them at a fair price, the nature of his farm, &c. In some instances this may be his

best plan, but in other cases he must combat the disease, and try his utmost in attempting to arrest its progress.

#### INFLAMMATION OF THE SPLKKN.

The spleen, or milt as it is commonly termed, is an elongated spongy viscus, lying on the left side of the abdomen and closely tied by the mesenteric membrane to the rumen throughout its whole extent. All are familiar with its appearance, but of its precise functions we have at present no very positive knowledge, although many have been the theories respecting it, and many the experiments to test those theories.

In the human subject the spleen is the chief organ which in cases of inveterate ague becomes enlarged, indurated, and disorganized. Generally speaking, however, as far as our own experience goes, we find it less subject to disease in animals than any other of the abdominal viscera. It would appear however that inflammation of the spleen is of more frequent occurrence in the sheep than has generally been supposed, but from what cause or causes is doubtful.

With respect to any plan of treatment we have nothing to say. Could we, from any definite symptoms, ascertain the existence of inflammatory action in this organ, we should have recourse to bleeding and aperients, which in all febrile diseases are the remedies chiefly to be depended upon; and, indeed, granting that no definite symptoms are to be detected, still the fevered condition of the system will demand these modes of reducing inflammatory action. So far then we cannot err; if they were manifest could we do more? we suspect not.

#### ACUTE INFLAMMATION OF THE LUNGS, OR PNEUMONIA.

Next to the rot inflammation of the lungs is perhaps the most common and most fatal disease to which sheep are liable; it runs a rapid course, and can only be arrested during the first stage, and the most vigorous treatment is necessary.

Various causes produce this malady; sudden cold acting on the body when overheated, the loss of the wool during inclement or changeable weather, hard driving, and the like. It often appears among the flocks in April, when the days are warm and the nights cold or frosty. Lambs overheated with play are at this season very liable to it, and both in sheep and lambs the farmer's loss is often very severe.

Inflammation of the lungs comes on with the usual febrile symptoms shivering, succeeded by fever, a hard quick pulse,

Loss of appetite, and arrest of rumination, the flanks heave, and a frequent and painful cough distresses the animal. This cough increases in violence, and the breathing becomes laboured, soon the pulse begins to waver, foetid matter runs from the nose, the animal grinds its teeth, and is tormented with thirst. Now comes the last stage; the cough changes its character and is weaker than before, the flanks heave convulsively, the pulse is almost imperceptible, the discharge from the nostrils increases, often there is a cracking from air beneath the skin on pressure of the loins, the animal staggers and the expression of the eye and countenance denotes great suffering—happily soon to terminate, for unconsciousness and death are near. On examination after death, the lungs will be found distended and gorged with black putrescent blood, and their substance to be gangrenous, so that a touch breaks it down or lacerates it. The heart mostly exhibits traces of inflammation, and there is fulness of the maniplus, distention of the abomasum, and often enlargement and softening of the liver.

From the peculiar condition of the lungs, the shepherds not unaptly call this disease rot of the lights.

It is only at the commencement of this disease that treatment is of any avail. Bleeding is the sheet-anchor of our hopes. Let the wool on the neck be parted (it need not be clipped), the jugular vein opened, and a pint of blood be extracted. All other modes of bleeding are here useless; what is done must be done effectually. After this smart purgatives must be given and their action kept up. Should the sheep faint from the loss of blood, the farmer need not be alarmed—the sheep that faints is more sure of recovery than another; the fainting shows that the arterial super-activity is arrested.

After the action of the purgative medicines, it may be advisable to give sedatives, of which the following may be adopted:—

Nitrate, 1 drachm.  
Digitalis powder, 5 or 8 grains.  
Tartar emetic, 5 grains.

Mix in a little water or thin gruel—to be given twice a-day.

The animals should be kept in a place sheltered alike from heat and from piercing winds; their diet should consist of mashes and a little grass. When convalescent, tonics, as

gentian and ginger, may be administered, provided they do not rally well from their debility.

Acute pneumonia sometimes appears as an epidemic, and makes great havoc.

#### HOOZE, OR BRONCHITIS.

This disease consists in an inflammation of the lining membrane of the bronchial tubes, and is characterized by a peculiar *wheezing* cough. It is apt to attack lambs when exposed too early to damp and cold. Besides the wheezing cough, there is difficulty in breathing, the flanks heave, and the appetite fails. If attended to in time a few doses of Epsom salts with ginger, and removal to shelter, will generally effect a cure.

In young cattle inflammation of the lining membrane of the larynx and bronchial tubes is accompanied by thousands of parasitic worms (*Filaria*), which block up the passages, and often produce suffocation. This is not often the case in the sheep, yet it does occur, and may be suspected when the wheezing cough is particularly distressing, when it does not yield to medicine, and when the young animals have been feeding in low woody pastures. The first thing to be done is to remove them from the old pasturage to one which is well drained and healthy; afterwards remedies may be tried. Mr. Mayer, of Newcastle-under-Lyme, recommends the administration of common salt, in doses of an ounce and a half or two ounces daily, with six or eight ounces of lime-water given at another period of the day. Mr. Youatt states that he has found this plan of treatment very successful both in sheep and young cattle.

#### LARYNGITIS.

Laryngitis consists in inflammation of the lining membrane of the windpipe, and is distinguished from bronchitis by a peculiarly *ringing* cough. It results from cold and from changeable weather, and is sometimes epidemic. In this disease the sheep often stretches out its head as if to breathe more freely, opening its mouth at the same time; it labours evidently under a fear of suffocation, or at least under feelings of suffocation; and, indeed, from the morbid thickening of the membrane, and the closure of the entrance into the windpipe (*Rima Glottidis*), this often happens. In urgent cases bleeding should not be omitted, and active purgatives should

be administered ; the animal should be placed under shelter and be fed upon mashes and gruel.

#### CATARRH, AND EPIDEMIC CATARRH OR INFLUENZA.

Catarrh, or Hooze (a name given to affections of the respiratory passages generally), consists in inflammation of the lining membrane of the great nasal cavities, and thence spreading to the fauces, the glands of the throat, the larynx and windpipe. The eyes are bloodshot, there is a discharge from the nose, accompanied by frequent sneezing, and a cough supervenes, indicative of the morbid state of the windpipe, perhaps even of the lungs. Catarrh, however, varies in degree ; sometimes it is mild, at other times it is severe, and attended by febrile symptoms ; it then requires active treatment, otherwise it is likely to terminate in consumption.

In mild cases, aperients, mashes, and a dry sheltered place will probably succeed, but when there is a decided cough, then the loss of blood is necessary, in order that the progress of inflammation may be at once arrested. Catarrh should never be neglected, however apparently slight, as it is apt to pursue its course insidiously till the lungs become radically diseased.

Sheep are particularly liable to catarrh at the fall of the year, after wet weather ; they should be well sheltered, and have a dry place selected for their rest at night ; but to these points sufficient attention is seldom paid.

With regard to epidemic catarrh or influenza, it occasionally appears as the scourge of a flock, and resembles the disease termed influenza in the horse. "We at once recognise in its symptoms," says Professor Spooner, "the low fever, and the affection of the head, and of the mucous membranes, which characterise this disease in the horse."

#### CONSUMPTION, OR PHTHISIS.

What we have said respecting consumption in the case of the ox applies with equal force to the sheep. It is the result of neglected catarrh, or of subacute or chronic inflammation, running perhaps an insidious course, and ending in the production or in the development of tubercles previously latent, which increase in size, unite into larger masses, suppurate, and form spreading abscesses, by which the lungs are, as it were, gradually wasted away.

What can be done under these circumstances? Nothing. It is true that, in incipient phthisis, iodide of potassium, in

doses of three grains morning and night, the dose being gradually increased to twelve grains, has been recommended; but it will not pay the farmer to keep a sheep merely for the purpose of trying the effects of iodine, persevered in for months, setting aside the trouble. No; the best thing he can do is to prepare a *coughing* sheep as soon as possible for the butcher. Neither from ram nor ewe ought he to dream of breeding, for the offspring will bear in their system a predisposition to the disease of their parents. Let him, we say, get rid of his suspected sheep while yet in good condition, before wasting has commenced, or at least when he sees that they cease to thrive.

BLAIN, OR GLOSS-ANTHRAX.—INFLAMMATION OF THE TONGUE AND THE PARTS ADJACENT.

We have already described this disease in the ox. It is a disease to which sheep are not very liable, although it occasionally appears, and sometimes even as an epidemic. It appears, moreover, to be infectious. The causes of this disease are obscure. Probably it arises from some unknown atmospheric influence acting on a constitution predisposed to it from debility, occasioned by exposure to wet and cold, or by improper or insufficient food.

At the commencement of the disease the animal exhibits the usual febrile symptoms. In a little time, however, a quantity of saliva begins to drop from the mouth. This discharge is at first limpid and devoid of smell; but as the disease makes progress it becomes bloody, purulent, and extremely fetid. The inflammation now rapidly extends itself; the head and neck swell, often to an alarming degree; the animal breathes with difficulty, for the pharynx partakes of the inflammation, and almost closes—indeed, sometimes suffocation absolutely takes place. If the mouth be examined, a succession of vesicles will be found to have risen along the side of the tongue, and also underneath it. Their colour varies from red to a livid hue; they have grown rapidly; many have burst, and produced deep sloughing ulcers; while abscesses form around, which break outwardly.

It would appear that this (or a variety) is the disease described by Mr. Hogg, under the name of *great-head*, as not uncommon among sheep in Scotland, but rare south of the Tweed. He states that on some of the Kells hills in Galloway, in certain parts of the Grampians, and in Skye, such

sheep as frequent the bare and bleak tops of the hills, if the precaution of driving them every night to the lower parts be not taken, are subject to a disease called the *great-head*. The head rapidly enlarges, and at length an abscess is formed; after this, unless indeed the animal be worn down by the profuseness of the discharge, it quickly recovers. Sometimes there are more abscesses than one, and occasionally gangrene ensues.

In the early stage of blain, during the fever, bleeding may be of advantage; but blood must be taken with caution, for the stage of collapse is to be feared; indeed, the time for bleeding has generally passed by before anything particular has elicited attention. The next step is to secure the animal, and (remembering that the disease is contagious) to open its mouth and freely lance every vesicle, so as to give vent to the glairy fluid they contain. The mouth and tongue should then be thoroughly washed with warm water, and afterwards deluged with a solution of the chloride of lime (a drachm to a pint of water). Should there be abscesses about the neck or jaws, they must be opened by the lancet, and their contents evacuated. In the meantime, the strength of the animal must be kept up with oatmeal gruel, in which powdered gentian may be mixed, chopped carrots and turnips, bruised oats, and whatever is nutritious. If requisite, a tonic aperient should be administered.

#### THRUSH, OR APHTHE OF THE MOUTH.

In some respects this disease resembles blain, but there is not that enormous swelling of the head, neck, and throat, which is characteristic of the latter; nevertheless, it belongs to the same order of maladies, and may be a mere variety. It commences with inflammation of the mouth, which runs on to the production of small vesicles. The causes of this affection are obscure; but it is sometimes epidemic and very fatal. The first symptoms, as is usual, are febrile; but the degree and duration of the fever, or the inflammatory stage, vary. The sheep is dull; it pines; it wanders about, ceasing to feed, and ceasing to ruminate; viscid saliva drips from its mouth, and this perhaps excites attention. The animal is secured and its mouth examined; several small vesicles are found within in different parts, and sometimes even about the nostrils and lips. This affection is readily cured; the mouth should be well cleansed, and then laved with a weak

solution of alum, or tincture of myrrh and water. A purgative should be given.

Mr. Youatt has remarked that there is often a curious coincidence between thrush in the mouth and foot-rot when the latter has run to ulceration; but whether in consequence of licking the foot or rubbing it with the muzzle the mouth has become inoculated, or whether there is a connexion between the two diseases, is not very clear. At all events, when the farmer sees a sheep afflicted with foot-rot, discharging viscid saliva from the mouth, and neglecting its food, he may be certain that the animal has thrush, and must act accordingly.

Although thrush in sheep is generally cured with little trouble, it sometimes assumes a more serious form; and on the continent has several times appeared as an epidemic, and proved exceedingly fatal.

Scabby eruptions about the muzzle, eyes, and ears of sheep, are not uncommon. This complaint is often called *black-muzzle*, and is mostly to be observed in lambs. It is not infectious, and is easily cured by a little purgative medicine, and the application of sulphur ointment, mixed with a twelfth part by weight of mercurial ointment.

#### STRANGLES, OR STRANGULLION.

Strangles is the common term given to inflammation and suppuration of the salivary glands. It is of rare occurrence in sheep. At first a swelling appears under the lower jaw, it increases, and is painful; the animal is feverish, it loses its appetite, and coughs, and becomes rapidly extremely weak and depressed. In a shorter or longer time the tumour gives evidence of suppuration; if its progress is sluggish, fomentations, poultices, or even a blister may be resorted to, in order to hasten it. As soon as the tumour points, it must be freely opened with a lancet, and the purulent matter allowed to escape, otherwise it will burrow, and cause foul ulcers in various parts of the throat. The abscess may be washed with a solution of chloride of lime, and gradually healed by dressings of tincture of aloes. If the fever is *very* high at the commencement of this disease a little blood may be taken away, and an aperient given; but the debility which ensues on the suppuration of the tumour, and continues often for a considerable time, must be kept in view. Tonics of gentian and ginger, gruel, and other nutritive preparations

of food, may be required in order to restore the animal to its wonted strength.

Sometimes, before the tumour has advanced far in its progress, it may be checked and dispersed by the exhibition of a smart aperient, and the use of the hartshorn liniment, in which the *liquor ammoniæ* should predominate over the oil.

HOOVE, OR DISTENTION OF THE STOMACH WITH GAS; DISTENTION OF THE RUMEN WITH FOOD, AND OBSTRUCTION OF THE GULLET.

With respect to the casualties, hoove, &c., above enumerated (diseases we cannot call them), we have nothing to add to what we have already said. Read's stomach and enema pump, of a size adapted for the sheep, and probangs, ought to be in the possession of every sheep farmer, and also an œsophagus tube, with its perforated bulb and stylet. The rude and often fatal mode of relieving the rumen of gas, by means of plunging a knife into it, at the left flank, where it is prominent, should never be allowed; if a puncture must be made, it should be done with a small trochar having a silver canula, the canula to be retained in the wound, so that no portion of gas or food may find its way into the cavity of the abdomen. Mr. Youatt says that he had once occasion to puncture a sheep seven times in the space of four days. It was sent to the butcher two months afterwards. There was not a vestige of disease in the whole of the abdomen, and it was with difficulty that any trace of the wounds in the rumen could be discovered. He used the trochar.

It occasionally happens that a hard piece of carrot or turnip becomes impacted in the gullet, producing symptoms of choking, difficulty of respiration, and violent spasmodic actions of the muscles of deglutition. Sometimes this obstruction may be removed even by means of the finger, and almost always forced into the rumen by the gentle use of a probang, made of a tube of leather, with a cane stylet. Even by manipulation alone, a little oil having been poured down the throat, the obstructing substance may be often urged onwards. It is seldom that an incision into the gullet, upon the obstructing substance, is really necessary.

POISONS.

Sheep feed either voluntarily or with impunity upon more plants than does the horse or the ox. Lambs, however, especially when weaned early, and obliged to browse, often

perish from eating deleterious plants.. The most common vegetable poison, from the effects of which sheep die, is the foliage of the yew, which is fatal alike to the horse and the cow. Another deleterious plant is the corn-crowfoot (*Ranunculus arvensis*), one of the first flowers that appear in the spring among wheat or on fallow lands.

In cases of poison from the yew, the best plan is to unload the stomach, by means of Read's pump, as quickly as possible, to wash it thoroughly out with warm water, and afterwards to give active purgatives.

#### SWELLING OF THE JOINTS, OR LEG-EVIL.

This disease consists in inflammation of the ligaments and cartilages of the joints of the limbs, generally of the knees, sometimes of the fetlock, occasionally of the hock. It results from damp and cold, and mostly occurs in lambs a few weeks after birth.

At first the joint swells, and becomes hot, stiff, and extremely painful; the swelling and pain increase, and the system sympathises. The poor animal can now no longer stand; it tries to crawl along on its knees, but soon this is impossible; it cannot raise itself; the whole limb is now enlarged; the joint is dropsical, or it ulcerates, and purulent matter is discharged; and now the animal wastes away and dies, or if it survive it will be only a burden to itself from confirmed lameness.

This disease should never be neglected. The moment a lamb appears to move stiffly, it should be placed under shelter, the affected joints fomented, and then embrocated with a stimulating liniment, as hartshorn and oil, or soap liniment, the bowels kept in due action, and cordials in warm gruel be administered.

#### RHEUMATISM.

Rheumatism, sometimes acute, sometimes chronic, frequently afflicts sheep, generally lambs or aged sheep, and is the result of exposure to wet, cold, and piercing winds. Sheep afflicted with this disease move stiffly, and as if in pain; they force themselves along, and look thin and miserable. Warmth, shelter, and mild aperients may be of service, and in the case of lambs some good may be done; but in old sheep little permanent amelioration can be expected. The sooner the

animal is prepared for the butcher, the better. It must be fed under shelter, or probably it will not feed at all.

## FOOT-ROT.

Before we speak of pure *foot-rot*, it will be right to distinguish a disease confounded with it under the same appellation. We allude to a disease of the interdigital pit or sacculus, involving the pastern and fetlock joints.

This interdigital pit, which does not exist in the ox, the goat, nor in many antelopes, although in others it is present, secretes an unctuous fluid, which oozes from its orifice,—a small opening, capable of admitting a probe, just at the bifurcation of the pasterns. The use of the secretion is conjectural.

Occasionally this canal becomes the seat of disease, which, though called *foot-rot*, is in reality distinct. It is liable to inflammation, generally from the introduction of sand or gravel, or from fatigue, or travel on hard roads; and consequently the mischief is most prevalent on dry, hard, stony pastures, or in sandy places, and in hot sultry weather. From the course of this canal we may easily understand how its inflammation will produce lameness. This inflammation extends to the whole of the foot, which becomes hot and swollen. Let the foot be neglected, and what is the result? Abscesses and ulceration. The purulent matter will burrow under the coronet, produce quittor, and perhaps loss of the hoof, while ulcers will break out around the fetlock-joint.

It is generally only in one of the fore-legs that this disease appears, causing the sheep to hobble along upon three; but sometimes both the fore-feet are affected, in which case the poor animal is constrained to kneel, and creep about after food in this unnatural attitude. We say after food, but in truth the animal feeds but little,—it is in pain, ill, feverish, and pining.

Formerly this disease was attributed to the presence of a worm of some kind (and indeed even now the idea is not extinct), and cruel operations were recommended for the purpose of extricating this imaginary usurper, this *worm o' the foot*. We can only say, "There is no such thing."

From the nature of the parts involved in the inflammation and secondary mischief, cure, excepting at the outset of the disease, is not easy. If taken in time, some good may be done. The canal must be cleared of any irritating substances, partly by means of a probe, and partly by a fine

pointed syringe, with warm water. The foot must then be fomented and enveloped in a warm poultice; purgative medicine should at the same time be given, the animal be removed to a sheltered straw-yard, and put upon low diet; if very feverish, a little blood may be taken away. Perhaps a discharge of purulent matter may take place; but this will gradually subside under the poultice, frequently renewed; and should any small abscess appear, it should be opened. But, speaking generally, it is only when the disease of the canal or duct has advanced to a high degree that it claims notice; and it is then that curative attempts are made. Little can now be done. It is true that the canal may be dissected out; but how horrible the agony! It may be enlarged at the orifice, and laid open by means of a bistoury, or a threaded seton-needle may be run along its course and brought out just above the coronet. We would sooner kill the sheep, and put up with the loss, than inflict such torture, especially as the animal will be good for nothing afterwards. However, if the canal be dissected out, or laid open, the wound must be dressed with digestive ointment, and afterwards with tincture of myrrh. When this disease is confirmed, and before the sheep begins to wear down, let it be sent to the butcher. Its flesh is good; the mischief is merely local.

From this disease, which may be termed *spurious foot-rot*, we proceed to that dreadful scourge,

#### THE TRUE FOOT-ROT.

The sheep is naturally formed for dry hills and mountain districts, on which, by ordinary exercise, its hoofs wear as they grow, and where they are not softened by mire, or marshy or humid ground. Soft, rich, marshy pastures are alien to its real nature; and when we make the sheep an *artificial* being, we entail upon it many diseases, from which it would be otherwise exempt. One evil, of no common degree, which arises from the depasturing of sheep on rich luxuriant meadows, soft lawns, and verdant but swampy or oozy grounds, is the foot-rot.

If we examine the bifid foot of the sheep, we shall find the hoof with which the toes are shod to consist of a hard wall, or upper portion, and a sole on the under part, which becomes softer as it proceeds backwards, and which in elasticity and functions is analogous to the frog in the foot of the horse.

Now, the hard rigid crust or wall of the hoof keeps up a sharp edge on the outer margin and apex, and is mainly intended to resist the wear to which the foot of the animal is naturally exposed; and growth and wear ought to be in a parallel ratio. On low moist land the detrition of the hoof is not in proportion to its growth; and the more so, as the high feeding tends to induce an acceleration of the horny secretion. Besides this, the hoof is kept in a perpetual state of maceration. What is the consequence? The hoof grows out of its natural proportion, it cracks, the overgrown parts become rent, and sand and dirt enter the fissures and work up to the quick; but what is still worse, the bearing of the hoof is altered; the sole no longer sustains the weight of the fore parts—this ragged overgrown crust has to bear it; the toes become distorted; the subjacent mesh of vessels and nerves are tortured; inflammation commences; ulcers and quitters form; the coronet is swollen; sinuses run in various directions; portions of the hoof become dead and detached, perhaps the whole hoof; and bones, cartilages, and ligaments become involved in one common mischief. Granulations arise, and assume an unhealthy appearance, and the work of destruction goes on. Another cause now aggravates the malady. Flies deposit their ova on the edges of the ulcers or abscesses; the maggots enter into every sinus, and burrow in all directions. Then, indeed, the foot becomes awfully diseased, and the poor animal is a miserable, crawling, emaciated object.

After all, however, this disease is not unmanageable at the outset; it may be treated successfully. All the dead and superfluous horn, all that is detached from the parts beneath must be cut away; the sinuses must be fairly laid open. The granulations must be cut down by means of fine scissors, and then freely touched with caustic. The foot must then be well cleaned, washed with a solution of chloride of lime, and then bound up in tow. Butyr of antimony (chloride of antimony), from its action in repressing fungous granulations, is very valuable. It should be applied to the denuded parts, especially where granulations have been cut off, or where others appear to be springing up. We need not say that the foot or feet should be dressed every day, each new exfoliation of hoof carefully removed, the abscesses cleansed, and caustic applied where it is requisite. After each dressing, the foot should be embedded in soft tow. In all this there is great

trouble and some expense ; but under these unfortunate circumstances what is to be done ? Little, indeed, unless the disease be treated early ; if not, the farmer will see his sheep crawling about on their knees, and wasting away under dreadful suffering.

Is foot-rot infectious or not ? The point is in dispute. Some contend that the discharge from the feet of diseased sheep, applied to the feet of sound sheep, will inoculate them, and produce rot ; and although we are somewhat sceptical on the subject, it is but right to say, that there is at least presumptive evidence in favour of this theory.

#### THE SCAB.

The scab is a cutaneous disease, very infectious, and of the same nature as the mange on other animals.

The scab is most prevalent in the spring, and may be produced by a variety of causes, as starvation, dirt, wet, and cold, and the like ; but the great source of the mischief is contagion. If a tainted sheep once gets into a flock, unless it be immediately removed, all the rest will become infected. It is not so much communicated by the sheep coming in contact with a tainted individual, as by their resorting to the same rubbing-places. It is thus that the skin of the sound sheep receives the infection. Hence it has happened, that when a diseased flock has been removed altogether, and a healthy flock substituted in its place, that the new comers have soon manifested the symptoms of this plague. They have rubbed themselves against the gates, posts, or palings, to which their predecessors had resorted, and have caught the infection. When this is pointed out, it becomes needless to urge the necessity of washing such posts, &c., and of repainting them before sound sheep are allowed access to them.

If the skin of a sheep infected with scab be examined, it will be found to be red and rough and more or less covered with pustules, which have broken, perhaps, in various parts, and run together, forming patches of crust, of greater or less extent, covering a sore or ulcerated surface. The animal is restless, it nibbles itself, it tears off its wool, it rubs violently against any object ; it scratches itself to pieces with its feet ; it becomes fevered, and ceases to feed ; and sometimes sinks exhausted by perpetual irritation and suffering.

It is about the twelfth day, after a sound sheep has taken the infection, that the disease makes its appearance. It

comes on with violent itching, the animal is very much disturbed, and scratches and rubs itself with unusual vehemence. The skin is at first rough, and covered with small hard pimples, or pointed elevations. These run into pustules, filled with purulent matter, and they break in about four days, and form scabs. The wool falls off in patches, or is torn away, and the fleece is harsh and dry.

The immediate cause of these pustules, and all the attendant evils, is attributable to the presence of minute burrowing insects or mites (*acari*), and in this respect is analogous to the mange in cattle, and the itch in the human subject. Hence it is, that when sheep lie huddled together in the fold, or rub on a post or gate where infected sheep have been, the animalcules are received, creep to the bottom of the wool, and commence their burrowing operations. Yet, strange to say, it is for the most part in unhealthy sheep that this disease makes its first appearance; and long-woolled breeds are more liable to it than short-woolled.

With respect to cure, it is not always very easily accomplished. One plan is to dip the animal into a solution of arsenic, drenching the fleece and skin. Half a pound of arsenic will be sufficient for twelve gallons of water; but arsenic is dangerous; and if the sheep be too long in the solution, fatal consequences may ensue. Mercurial ointment has been tried; and, if used, should be diluted with from three to five parts its weight of lard. Probably the *unguentum hydrargiri nitratis* of the London Pharmacopœia, diluted with four or five parts its weight of lard, might be very serviceable.

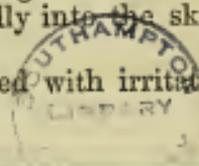
Mr. Hogg recommends the following ointment:—

Corrosive sublimate, 8 oz.  
 White hellebore in powder, 12 oz.  
 Whale or other oil, 6 gallons.  
 Resin, 2 lbs.  
 Tallow, 2 lbs.

Mix over the fire, the sublimate having been reduced to a fine powder, and incorporated previously with a portion of oil and the hellebore. It is a very dangerous ointment.

Mr. Youatt recommends diluted mercurial ointment, and directs that the wool be parted in lines along the back and sides, in order to rub it the more effectually into the skin; and that all loose scabs be removed.

Occasionally sheep are horribly tormented with irritation



of the skin, and furiously rub themselves, when no alteration on its surface can be discovered. The disease is subcutaneous, but from what cause is not very clear. However, the sheep gradually waste and die emaciated, with the fluids putrescent. The infected sheep should be shorn and housed, washed well with soap and water, and then every other day with equal parts of lime-water and decoction of tobacco. Mercurial ointment, diluted with seven parts of lard, rubbed into the skin, has been found serviceable. A mild tonic purgative may be given. Of the diluted mercurial ointment, only two or three ounces should be used at a time, every second day, for three or four times.

#### THE SHEEP-TICK, AND SHEEP-LOUSE.

Sheep are often tormented with these parasites, which fix on the skin, and fill themselves with its fluids.

The sheep-tick (*Acarus redwivius*) is a formidable insect, and is furnished with a sharp proboscis, which it buries, head and all, within the skin. The sheep-louse (*Hippobosca ovina*) is small, active, and of a reddish colour, and often swarms in lambs and young sheep in incredible numbers.

These parasites may be killed by means of tobacco-water, or mercurial ointment, diluted with seven parts of lard.

#### THE FLY.

Certain species of fly, about the middle of May or beginning of June, are very troublesome to sheep. They abound in wooded localities, and lay their eggs on the sheep, generally preferring the head, unless there are sores or scratches elsewhere. If sheep are troubled with diarrhœa, and the dung accumulates about the tail, they will select that part on which to deposit their ova. As soon as the maggots are hatched, they begin to burrow under the skin, producing great torture and irritation, and if care be not taken, the mischief becomes serious. The application of spirits of tar to the affected part will destroy them, and by its smell prevent the attacks of other flies. The coarsest, rankest kind of fish-oil, as we are assured by Mr. Hogg, will produce the same effect, and might, early in the spring, be smeared on the sheep as a certain preventive. Some recommend plaisters of pitch and bees'-wax to be spread upon the head over the sores, or indeed over the whole of the head, as a precautionary measure; but the train-oil rubbed on it would, we think, be better, and more

comfortable to the animals. The following powder, sprinkled on the places where the maggots are at work, is often used:—

White lead, 4 parts.  
 Arsenic, 1 part.  
 Sulphur, 6 parts.  
 Cinnabar of antimony, 2 parts.  
 Mix well together.

#### GARGET, OR INFLAMMATION OF THE SUBSTANCE OF THE UDDER.

Ewes, during the time of suckling, are very liable to inflammation of the udder, either from cold or damp, or some constitutional tendency to inflammatory action, directed to this part, the rather that its peculiar functions are now called into full operation, and more blood is transmitted to its vessels.

Sometimes one teat, sometimes both the teats, will be found inflamed, swollen, and tender, and knotty tumours will be felt, either confined to one portion of the udder, or universally distributed over the whole. If these are not to be felt, the udder may be more hot and tumid than is natural, sympathising with the tenderness of the teats. After the udder is cleared from the wool that surrounds it, it must be well fomented, and that for a considerable space of time; a dose of salts should then be given, and the ewe penned up with her lamb, and watched attentively; for the progress of garget in the ewe is very rapid, and not unfrequently terminates fatally. If in the course of the following day, the animal persists in refusing her teats to the lamb, it may be predicted that mischief is going on, and a rigid examination should again be made. Warm fomentations must be persevered in; and if the symptoms of inflammation be considerable, blood must be taken away, and the purgative medicine repeated. In the mean time, after fomenting, the following ointment may be rubbed over the udder, or the affected portion of it:—

Camphor, powdered by means of a drop or two of spirit of wine,  
 2 drachms.

Mercurial ointment, 2 drachms.

Elder ointment, 2 drachms.

\* Incorporate the ingredients thoroughly.

The milk must be carefully drawn away by the hand while this routine of treatment is pursued; and should the inflammation abate, but the knotty tumours continue without dis-

persing, the following ointment, rubbed on the udder, will prove of benefit:—

Iodide of potassium, 1 drachm.

Rub this down in two drachms of distilled or soft water till dissolved, and add Lard, 1½ oz.

Incorporate thoroughly.

Notwithstanding all that is done, it too often happens that the hard knots and tumours enlarge, and by their softening indicate the progress of suppuration. They now contain purulent matter, which must be let out by means of the lancet, otherwise a portion of the udder will become destroyed. Fomentations must be again used, and the ulcers washed with a weak solution of chloride of lime at least twice or three times a day, until the wound begins to assume a healthy appearance, when it may be dressed with Friar's Balsam. Under favourable circumstances, the healing will go on very rapidly, so that in a few days the ewe will willingly receive her lamb again.

A ewe which has once suffered from garget is very liable to a return of the disease from slight causes. Hence, unless there be some good reason for the contrary, it will be the best plan, after the weaning time, to prepare her for the butcher.

#### EPIDEMIC PLAGUE OR PESTILENCE.

From the times of remote antiquity until the present age, pestilential diseases have devastated our domestic races of animals, and have even extended their direful scourge to man.

To enter into a detailed account of these direful maladies which sweep away flocks and herds, and spread far and wide, their causes being vague and mysterious, is not our intention. We merely wish to remind the farmer, that what has been may be again.

#### THE VARIOLA OVIS.

The variola ovis, or smallpox in sheep, has been long prevalent on the continent; but even while thinning the flocks in France, opposite the English coast, it had only been known in England by name until 1847. It is supposed to have been then imported, and its ravages were so fearful, that it was found necessary to procure legislative interference (11 & 12 Vict. caps. 105 and 107, passed Sept. 4, 1848) to prevent

the diffusion of the disorder. These measures were to a considerable extent effectual—the destructive effects of the disease have been greatly lessened, but the best safeguard has been found to be inoculation. The matter should be taken from a sheep having mild variola, and slight punctures, or rather scratches, should be made with the charged lancet under the arms, or the inside of the thighs, or under the tail. Experiments have shown that when the inoculation has been effectual, sheep are perfectly free from the contagion, and that not more than from one to three in four hundred lose their lives in the process.

Variola ovis has been divided into two kinds—mild or benignant or distinct variola, and malignant or confluent variola. The first may be the consequence either of infection or inoculation; the second, almost uniformly of infection only. The period which elapses between the reception of the morbid influence, whether by exposure or inoculation, to the time of the appearance of the disease, is termed the *period of incubation*. On an average, after ten or fourteen days, the symptoms of the dreaded malady make their appearance. In cases of *mild variola*, the affected sheep separates from its companions, creeps into some obscure corner of the field, and with a look of deep dejection, hangs down its head, while its flaccid ears fall loosely on each side its face. Quick and hurried breathing announces fever; tears drop from the swollen eyelids, and mucus begins to be discharged from the nose; the vessels of the conjunctiva are preternaturally injected; and the arterial action is excited, the pulse being sharp, and about ninety-five per minute. We are now in the *eruptive stage*. On the inner side of the arms and thighs, and on the naked parts adjacent, as well as on the lips and cheeks, *papule* of a blushing red appear embedded in the dermis or true skin. These *papule*, which at first appear small, with a ring of inflammation round them, increase each to the size of a shilling, become prominent and conical, sometimes depressed in the centre. The thirst is now very great, the pulse becomes tremulous, and the bowels are torpid (sometimes, however, affected by diarrhoea). Rumination has ceased from the first, and all food is refused, except that the poor sufferer is disposed to lick the moist earth to cool its parched tongue. Not only over the naked parts, but over the whole skin generally, are the *papule* now spread. The animal struggles on. The *papule* are not confluent—at the end of three or four

days the papulæ change their character; hitherto they have been filled with serum, more or less stained with blood. But now comes on the *vesicular stage*. The elevations lose their redness, and become white and opaque; and in about three days the *stage of suppuration* comes on. In about three days more a scab is formed, which, drying, hardens into a crust (this stage is called that of *desiccation*): these crusts are of different colours, varying from a brownish-yellow to brownish-black. They are cast off with the epidermis, leaving pits or marks of different sizes on the site of the original *papulæ*. It must be observed, that where the papulæ, vesicles, or scabs have been injured or detached by the animal rubbing itself, the sores assume an irregular appearance, and it is some time before they heal. From the appearance of the eruption to the desquamation of the crusts, a period of sixteen or eighteen days elapses, sometimes more; after which the animal gradually recovers its usual health.

The treatment in *mild variola* consists in the administration at first of purgatives, as Epsom salts, and afterwards of tonics, as gentian and ginger. Common salt may be allowed freely. We need not say that sheep, exhibiting symptoms of incipient *variola*, should be immediately removed far from the flock, and placed in a sheltered spot by themselves, with every attention to their comfort.

*Confluent variola* in the sheep is a most fatal disease, and runs a rapid but uncertain course. It commences by active fever, which quickly assumes a typhoid character. The pulse is at first rapid, but it soon loses its strength, and becomes feeble and tremulous; the head swells; the eyelids are puffed up; the pituitary membrane presents various degrees of sanguineous congestion; the breath is fetid; the thirst is intense; and the animal seems to suffer extreme pain in the back and limbs. The wool falls off in patches, or is detached with a mere touch. After the fourth to the ninth day red spots, with inflamed rings at the base, appear on the lips and inner parts of the fore and hind limbs. These rise into confluent pustules, forming a mass of matter which is to assume a putrid character, degenerating into foul malignant ulcers, especially in warm weather, or when the animals are inclosed in too great numbers in closed or covered folds. During the progress of the disease, a yellowish fetid mucus runs from the nose; and pustules form in the interior of the nasal cavities, in the pharynx, and even on the lining membrane of the

larynx; occasionally concretions form at the entrance of the nostrils, stopping the orifice, and thereby impeding respiration. The eyes also are often involved in the mischief, the humours are changed, and irrecoverable blindness ensues. Sometimes portions of the lips slough away, and sometimes the animal is rendered lame. There is heaving of the flanks; moaning tones expressive of agony are uttered; the prostration of strength is very great, and the body is so tender that a touch will in some cases throw the sufferer into convulsions. Diarrhœa supervenes, and death soon closes the scene. In such cases, little can be done. All the sheep which exhibit symptoms of variola should be separated at once from the rest. In the early febrile stage, a mild aperient, consisting of two ounces of salts, half a drachm of aloes, and as much of ginger, in half a pint of warm water or thin gruel, may be given, and be perhaps repeated in a day or two. The animal should be then tempted to take food of a light nutritious kind, as boiled carrots, peameal gruel, linseed cake, and hay-chaff, moistened with water and sprinkled with salt. Sometimes the animals refuse food entirely, however tempting it may be; and in this case, gruel of oatmeal or peameal must be administered to them in the form of a drench. To this gruel a little good ale or wine may be added, especially if the debility seems alarming. The following mixture has been used with success in extreme cases of prostration:—

Sulphate of iron, 1 scruple.  
Compound tincture of cinchona bark, 1 drachm  
Compound tincture of gentian, 1 drachm.  
Good ale, half a pint.

This forms a drench.

When diarrhœa supervenes, opium is invaluable, and the following draught has been found very efficacious:—

Powdered opium, 15 grains.  
Powdered gill nuts,  $\frac{1}{2}$  drachm.  
Powder of catechu,  $\frac{1}{2}$  drachm.  
Linseed tea, half a pint.

The repetition of these doses must be regulated by the condition of the patient.

During the earlier stages of the eruption, no lotion or ointment of any kind should be applied to the skin; but when ulceration begins to make its ravages, something must be done

to check its progress, if possible. Mr. Simmonds strongly recommends a diluted solution of the chloride of zinc, the anti-septic and disinfecting properties of which are of a high order, and which, as a lotion for ill-conditioned wounds, has been found very efficient. The nostrils must be kept free from the obstruction of inspissated mucus, by frequent sponging with tepid water, and by smearing them with any simple ointment, as elder ointment or spermaceti ointment, rubbed up with a few drops of goulard extract (*Liq. Plumbi diacetatis*).

#### FRACTURES, STRAINS, WOUNDS, AND BRUISES.

From the brittleness of the bones of sheep, fracture of those of the limbs is not of unfrequent occurrence. In many cases, the fracture admits of being set and adjusted by means of splints skilfully applied, and the animal speedily recovers. In other cases, it is perhaps better to kill the animal at once, but not unless a veterinary surgeon recommends it. And here we would again urge the necessity of calling in his advice and assistance. Unless a broken limb be well set, and properly secured, the poor animal will be lame for life, and it cannot be properly set without a knowledge of anatomy, except perhaps in the simplest cases, where common sense dictates what is to be done.

With respect to strains, wounds, and bruises, sheep are, perhaps, not so much exposed as cattle; but when they do occur, the treatment must be nearly similar, varying according to circumstances.

#### GESTATION, AND THE MANAGEMENT OF LAMBS.

The period of gestation in the ewe is five months, or about 152 days, and the number of lambs produced varies from one to three; twins are common. The ewe is in a sufficient state of maturity for breeding at the age of fifteen or sixteen months, but the constitution of the ram is not confirmed till he be two years old. As the time of yeaning draws nigh, some farmers put their sheep upon rich pasturage, in order to give them strength, so as to enable them to undergo nature's trial the better, and yield afterwards a fuller supply of milk. This is a practice which cannot be too much condemned. In the first place, the sheep should have been from the earliest stages of pregnancy depastured upon good and sufficient food, so as to be at this juncture in fair moderate condition; in the second place, the sudden change

of diet is apt to induce inflammatory diseases, and perhaps the attack of garget, especially if the animals have been poorly kept. The digestive organs do not readily and all at once accommodate themselves to a change from low to high diet; and when they are once disturbed in their functional operations it is impossible to foresee what mischief may ensue.

Before the expected time of parturition, the ewes should be removed into a sheltered comfortable spot, as near home as possible, and convenient for the shepherd or lamber, on whom now devolves their care. When quietly settled, they should be neatly *clatted*; that is, the matted wool about the tail, the inside of the thighs, and around the udder, should be shorn off—a plan which adds to the comfort of the sheep, and to their health and cleanliness. Too much wool, however, should not be removed—discretion should be exercised; but an experienced shepherd or lamber will seldom err.

All is now in preparation. The lamber is on the alert, and, if a conscientious man, he will feel his responsibility. We have heard of careless brutal men intrusted with the superintendence of the ewes at this critical period, and we know that from neglect or ignorance the farmer often experiences sad loss; but it is his own fault. Let him bestir himself, and be vigilant in superintendence; let him exercise sound discretion in the choice of the lamber, and refuse, under any circumstances, to allow the lamber the skins of the dead lambs as his perquisites. What the farmer chooses to do with them afterwards is another matter.

The management of lambs is generally simple; they are left to the care of their dams, who usually prove faithful nurses. Occasionally lambs are abandoned, or lose their mothers, in which case the shepherd will have to supply them with foster mothers; and if no ewes are ready to receive them, they must be brought up by hand.

Lambs dropped in the latter part of April and the beginning of May, when the voice of the cuckoo is heard, are termed from that circumstance *cuckoo-lambs*. These lambs are usually very delicate, being the progeny of young or weakly mothers, and require more than ordinary attention; nor should the ewes themselves be disregarded.

In about a fortnight after birth, or even earlier, the lambs begin to nibble the grass, and care should be taken that this food be not too rank and luxuriant. The sudden transfer of

lamb from bare to rich pasturage is a great error in management, and more lambs die from this cause than the farmer suspects. The sudden change of diet either produces inflammatory fever or dysentery, in both cases baffling all remedies. The liver is disturbed in its functions; disordered bile is poured out in vast quantities into the duodenum, and frequently is regurgitated into the abomasum or fourth stomach. From the absorption of bile into the system, the skin assumes a yellowish tint, and the fat after death is also found to be coloured. This disease runs a rapid course, seldom enduring more than three days, and frequently carrying off the lamb in fourteen or fifteen hours. Immediate change of pasturage, the loss of a little blood in the commencement of the attack, and purgatives, afford a chance, and but a chance of cure. From the quantity of bile or gall poured out into the alimentary canal, this disease is in some places termed *Gall-Lamb*.

Few male lambs are kept for the purposes of breeding—one or two are perhaps selected—the rest are destined to become wethers, and at what period the operation should be performed may admit of a question. If the weather be cool, or even cold, and the lamb healthy, the earlier the better: less pain, less depression, less inflammation will follow if the operation be performed when the lambs are three or four days old, than if they were a fortnight or three weeks old; hot or sultry weather is unfavourable.

Docking is another operation which we think should be performed early, although some defer it till the lambs are three or four months old. We do not know what advantage results from this latter plan, but certainly the animals suffer more pain. It may be asked, why should the lambs be deprived of so large a portion of the tail; what end does this mutilation answer? Custom, the compact appearance of the short-tailed sheep, and cleanliness, plead in favour of the practice of docking.

It is the practice of some farmers to spay the rejected ewe lambs, as a means of increasing their growth and their tendency to lay on fat. The danger of the operation is less than might be anticipated, for, strange to say, inflammation of the peritoneum by no means always follows. Much of course depends upon the skill of the operator and the health of the lamb, which ought to be about six weeks old, and without any symptoms of incipient disease. To give direc-

tions respecting the performance of this operation is useless. It must be learned on the dead subject; no description will suffice to render the performance of it sufficiently intelligible for practical purposes, nor shall we attempt it.

The weaning of lambs ought to be a gradual affair, and is so under ordinary circumstances. The lamb, from the age of two or three weeks, has nibbled the grass of the pasturage, and this in an increasing ratio; the compartments of the stomach undergoing those changes in development and function which are requisite for the management of the vegetable aliment on which the animal is destined shortly to subsist altogether. The time of weaning varies according to pasturage, the breed of the sheep, or the intentions of the farmer. The average time of weaning is at four months old; occasionally, when the ground is good and it is desirable to sell the lambs in store condition, they are kept with their dams till the age of six months.

#### MEDICINES EMPLOYED IN THE TREATMENT OF SHEEP.

Simple medicines ought to be in the possession of the farmer for instant use, in cases of emergency; but the administration of the more potent drugs ought to be intrusted to the veterinary surgeon, by whom alone all important operations ought to be performed. Read's enema and stomach-pump adapted to sheep, should be in every breeder's hands, and kept constantly ready for use. In the treatment of many of the diseases of sheep, the advantages of purgative or of sedative injections are too much overlooked. Aperient injections may consist of a handful of common salt, or an ounce or two ounces of Epsom salts, with a wine-glassful of linseed oil, mixed in a pint of water or thin gruel. Sedative injections, in cases of diarrhoea and dysentery, may consist of a pint of gruel or starch, with three or four grains of powdered opium, or fifty drops of laudanum.

#### APERIENTS.

In administering medicines to the sheep, the fluid should be allowed to trickle slowly and gently down the gullet or œsophagus, as we have already urged in the case of the ox, and for the same reasons—the structure of the stomach

being in both animals on the same plan. To give medicine in a hurried manner, so as to force the animal to gulp it, is to defeat the very object intended; it will force the pillars of the œsophagean canal, enter the insensible paunch or rumen, and there continue inert. It may here be as well to observe that the doses of medicines for sheep in general are about one-sixth in quantity of what are usually given to cattle. Young lambs require only a third, or half the quantity of medicine constituting a dose for an adult sheep.

The following medicines are the most valuable aperients:—

COMMON SALT (CHLORIDE OF SODIUM OR MURIATE OF SODA).

Salt is a tonic in moderate doses, and of great benefit in the rot. It should always be accessible to the flock. In doses of one or two ounces, dissolved in four or six ounces of gruel, it forms an excellent aperient.

EPSOM SALTS (SULPHATE OF MAGNESIA).

An excellent purgative, and that which is most commonly employed. Its dose ranges from half an ounce to two or three ounces. The repetition of small doses at intervals of six hours will keep up the action of the first full dose when desirable; or sulphur may be employed for this purpose.

SULPHUR.

Sulphur, besides its value in cutaneous affections, is very useful as an aperient, especially for keeping up the action of the bowels after the operation of salts. Dose, from one to two ounces. Sulphur is the base of every ointment for the cure of mange.

ALOES.

This drug is not only very uncertain in its operation in sheep, but has often proved fatal, by inducing direct inflammation. It is invaluable as a horse medicine, but should never be administered to the sheep.

LINSEED OIL.

Linseed oil is occasionally used as a purgative; it is given in doses of two or three ounces.

## ALTERATIVES AND SPECIFIC MEDICINES.

These are medicines which exert a peculiar influence on certain organs, altering their diseased action, or stimulating their respective secretions. Some act more especially on the liver, others on the glandular system, and some on the skin; while one exerts a peculiar action on the muscular fibres of the uterus. A knowledge of the effects of these medicines has been gained by experience; but we know nothing of their *modus operandi*.

## CALOMEL (SUBMURIATE OR PROTOCHLORIDE OF MERCURY).

Calomel is seldom used in the treatment of the diseases of the sheep. In cases of rot, two or three grains of calomel mixed with a grain and a half of opium, have been found beneficial; this dose may be repeated every day, or every other day, for several times, its effects being watched.—(See Rot).

## SULPHATE OF MERCURY OR ÆTHIOPS MINERAL.

As an alterative medicine, useful in cutaneous disorders, Æthiops mineral has long enjoyed great reputation; it is usually combined with nitre and sulphur, in the following proportions, for a daily dose:—

Æthiops mineral, 1 scruple.  
Nitre 2 scruples.  
Sulphur, 4 scruples.

## IODINE.

Iodine is useful, both as an external application and as a medicine taken internally, in cases of glandular affections and indurated swellings of the udder. Its most convenient form is the iodide of potassium. An excellent ointment is composed of one part of the iodide, and seven of lard.

Iodide of potassium is strongly recommended in consumption, when tubercles have formed on the lungs. The dose is two grains, gradually increased to four or six, given morning and evening, in a little gruel.

## ERGOT OF RYE.

In cases of lingering parturition, when the powers of the uterus are exhausted, ergot of rye is very useful. It exerts a

peculiar action on that organ, and arouses its dormant energy. It should be employed with caution. The dose is a scruple or half a drachm, repeated at intervals of half an hour, if necessary. An infusion of ergot of rye is used by lambers and shepherds, conjoined with a cordial, composed of equal parts of brandy and spirits of nitre (*sp. æther. nitrici*).

### SEDATIVES AND FEBRIFUGE MEDICINES.

These are medicines calculated to allay fever, and moderate the action of the arterial system. Among these, nitre or nitrate of potass, tartar emetic, or tartrate of antimony, and the powder of digitalis, *i. e.* of the dried leaves of the foxglove, are chiefly in requisition. Opium, or tincture of opium (*laudanum*), are in a certain sense sedatives; indeed, in some diseases their use in allaying irritation cannot be overrated.

#### NITRATE OF POTASS.

Nitre is used as a febrifuge with good effect, but generally in combination with other medicines. Its dose is from half a drachm to a drachm.

#### TARTRATE OF ANTIMONY.

The effects of this medicine, in lowering the action of the heart and arterial system, is very decided. Hence, in many inflammatory diseases it is of great importance. It is given to the sheep in doses of five or six grains.

#### DIGITALIS.

The powdered leaves of the foxglove have been long esteemed for their decided effects upon the action of the heart. They not only reduce the force of the pulse, but often render it intermittent. Digitalis, in combination with nitre and tartar-emetic or tartrate of antimony, forms an efficient fever medicine in cases of high inflammation, as pleurisy and similar diseases.

The following formula for sheep has been used with success:—

Digitalis powder, 5 grains.  
 Tartrate of antimony, 5 grains.  
 Nitrate of potass,  $\frac{1}{2}$  drachm.  
 Water, 3 or 4 ounces.  
 Mix. To be given twice a-day.

## ANTISPASMODICS.

The great antispasmodic, the great allayer of pain, and of irritation of the alimentary canal, whether in cases of diarrhœa or dysentery, is opium.

## OPIUM.

The dose of this all-potent medicine (when judiciously administered) is two or three grains. Combined with oil, it has been given in dysentery with the best effects. Mr. D. Sayer found in certain cases of dysentery the following prescription of great service:—

Linseed oil, 2 oz.  
Powdered opium, 2 grains.  
Mix in an infusion of linseed.

On the following day, he gave twice in the twenty-four hours this mixture:—

Powdered opium, 2 grains.  
Powdered ginger, } of each,  $\frac{1}{2}$  drachm.  
" gentian, }  
Mix in linseed tea.

Afterwards this draught was repeated once a day, with the addition of half an ounce of linseed oil. This was continued for four days, when the sheep recovered.

In cordial and astringent medicines, opium is an essential ingredient, and it may also be combined with aperients.

## LAUDANUM, OR TINCTURE OF OPIUM.

Tincture of opium possesses the same properties as the powder of opium, but is perhaps quicker in its effects. The dose for sheep is from twenty to sixty drops.

## TONICS.

It is often necessary in cases of debility, when acute diseases have been subdued, to restore or invigorate the system by tonics. Of these, gentian is the best, and, indeed, will supersede every other.

## GENTIAN.

Powdered gentian root may be given as a tonic in doses of from half a drachm to two drachms, in combination with a scruple or half a drachm of powdered ginger in gruel or water, or in a little ale.

## CORDIALS.

Cordials, or stimulating drenches, are not so often given to sheep as to horned cattle. The best of these cordials are ginger, caraway-seeds, essence of peppermint, and carbonate of ammonia.

## GINGER.

The dose of this root in powder is from a scruple to a drachm. It is generally mixed with aperient medicines, and aids their operation.

## CARAWAY-SEEDS.

Bruised caraway-seeds are useful as a cordial, though inferior to ginger. Dose: half a drachm or a drachm.

## OIL OR ESSENCE OF PEPPERMINT.

Peppermint water,—that is, water in which the oil of peppermint is diffused,—is a good vehicle for tonic and astringent medicines. It is never given alone.

## CARBONATE (SUBCARBONATE) OF AMMONIA.

In cases of repletion of the stomach by a mass of undigested curd (to which lambs are subject), carbonate of ammonia may prove very useful, both from its stimulating and its antacid properties. A drench, composed of a scruple of carbonate of ammonia, two drachms of carbonate (sesqui-carbonate) of soda, half an ounce of Epsom salts, and a scruple of ginger, in warm water, may be given every six hours.

A solution of potash in lime-water is recommended in these cases. We here give the directions for making and administering this solution:—

Take a lump of quick-lime, of the size of an egg, and pour on it, in a convenient vessel, as much water as will slake it. This being done, then pour upon it one pint of boiling water; stir the whole up, and cover close. While this is allowed to stand for some time, take an eight-ounce bottle, and put into

two ounces of subcarbonate of potass, and fill up the bottle with the lime-water already made: pouring it off rather turbid than in a state of purity. Cork this up, and label it, "Solution of potass in lime-water."

Of this "solution," a teaspoonful or two should be added to some warm water, together with half an ounce of salts and scruple of ginger, and given every six hours, till good effects result.

We can hardly call this a cordial medicine. Its effects, setting aside the Epsom salts, are chemical, and the same observation applies to chloride of lime given internally in cases of hoove. Its dose in the shop is about half a drachm. As a disinfectant and cleanser of foul ulcers, a solution of chloride of lime, applied externally, and used freely as a wash, is invaluable.

#### CHLORIDE OF LIME.

For its properties, see above. A solution of chloride of lime, for washing infected sheep-cotes, ulcers, &c., may be made with half an ounce of powder dissolved in a gallon of water. Taken internally in hoove, it acts chemically as a cordial by secondary effects.

#### CARBONATE (SESQUI-CARBONATE) OF SODA.

Carbonate of soda is an antacid, and useful as a component in cordial draughts, where the correction of acidity in the stomach is desirable. Dose: about a drachm.

#### ASTRINGENTS.

Astringents are medicines which act upon the mucous membrane of the alimentary canal, and check diarrhœa. They consist of lime, or chalk, opium, catechu, &c., and are always combined with cordials. Of lime, or rather chalk, little need be said; it is given in doses of half a drachm or a drachm. Of opium, we have already spoken.

#### CATECHU.

This is an extract from a tree of the acacia tribe, and is very valuable. Dose: a scruple.

The following is a useful astringent cordial for sheep and calves:—

Prepared chalk, 1 oz.  
 Powdered catechu,  $\frac{1}{2}$  oz.  
 Powdered ginger, 2 drachms.  
 Powdered opium,  $\frac{1}{2}$  drachm.  
 Mucilage or gum-water, thick, 2 oz.  
 Peppermint-water, 6 oz.

Mix. Dose, two table-spoonfuls twice a-day.

#### ALUM.

Alum is not often used in the treatment of sheep. Its dose is ten or twenty grains, according to age. The "Sheep's Cordial" renders it unnecessary.

### EXTERNAL APPLICATIONS.

Setons are seldom used in the treatment of the diseases of the sheep, and the wool prevents blisters from taking effect. With respect to chloride of lime, as we have noticed it under the head of cordials, we need not repeat our observations relative to its value as a disinfectant and cleaner of foul sloughing fetid ulcers, when properly diluted with water (half an ounce to the gallon).

The following external applications require a brief notice:—

#### POULTICES.

Those of linseed meal are best; it is often advantageous to mix with them a little chloride of lime, especially if they be applied to foul ulcerations. In accelerating suppuration, a little turpentine is a useful addition.

#### STIMULANTS.

Turpentine, camphorated oil, and hartshorn, form a good embrocation, useful in strains and chronic rheumatism. To two ounces of camphorated oil may be added an ounce of turpentine, and half an ounce, or even an ounce of hartshorn.

#### OINTMENTS AND LOTIONS, &c.

*Mercurial Ointment*, when rubbed down with five or seven parts of lard, forms a safe and almost certain cure for the scab.

*White Lead* is often sprinkled over the part struck by the fly, in order to destroy the maggots burrowing in the skin. It is superseded by the spirit of tar, or by the coarsest kind of fish oil.

*Corrosive Sublimate.*—A dangerous remedy, often employed in solution as a wash for scab. Washes, whether of a solution of arsenic, infusion of tobacco, or of hellebore, are equally objectionable. They are superseded by the diluted mercurial ointment.

*Spirit of Tar.*—A useful application in foot-rot, and very serviceable when freely applied to parts that have been struck by the fly; it not only kills the maggots, but prevents the attacks of the insects, which are repelled by its odour.

*Turpentine.*—Useful as a stimulant in ointments and embrocations. It may be mixed with linseed-meal poultices, in order to hasten the suppuration of sluggish tumours, and is a serviceable application to wounds of long standing which require a stimulus.

## DRESSINGS.

Among the dressings for wounds, tincture of aloes, tincture of myrrh, and tincture of benzoin, or Friar's Balsam, are chiefly in request.

Tar mixed with lard is a useful dressing in foot-rot.

## CAUSTICS.

At the head of caustics stands nitrate of silver, or lunar caustic. It is to the free use of this that the veterinary surgeon will trust in probing the wounds of cattle caused by the bite of a rabid dog. It is very useful in removing warts and cutaneous excrescences.

Other caustics, however, are in requisition. In cases of foot-rot, hydrochloric acid, or a solution of bichloride of mercury, is recommended by Mr. Read, as an application to the part infected. (*See Foot-rot*).

Butyr of antimony, or chloride of antimony, is a very useful and convenient caustic. It has been employed in foot-rot, and acts well where a superficial effect only is required. It does not produce any deep corrosion; hence in indolent ulcers, in foot-rot, and in the removal of fungous excrescences, it is of important service.

Verdigris, or acetate of copper, mixed with sugar of lead, finely powdered, sprinkled on sluggish ulcers, sometimes acts with good effect.

Blue vitriol, or sulphate of copper, finely powdered, is frequently employed as an escharotic, in order to produce superficial sloughing. A saturated solution is recommended

by some veterinarians as an application of great benefit in cases of foot-rot.

#### FOMENTATIONS.

The great benefit resulting from fomentations arises from the warmth of the water. In cases of inflammation of the udder or garget, fomentations are indispensable. Many have an idea that the good effects of fomenting depend on the herbs which, as is generally the case, are boiled in the water; but this is an error. Poppy-heads, or a little laudanum in the water may be advantageous, from the known properties of opium in allaying pain. Slight fomenting is useless—it should be long kept up; but this is seldom done, for it requires no small degree of quiet patience.

#### PLAISTERS, OR CHARGES.

Plaisters, or charges, are in frequent demand. They are useful in cases of sprain or local debility, or as a covering and protection to sores or wounds, or the basal part of fractured horns. They form a good defence in case of travel-worn feet, and in various ways are serviceable. They consist of a mixture of pitch, wax, resin, lard, &c., in different proportions, thickly spread upon coarse cloth or leather. Tar, spread upon cloth, forms an excellent plaister, especially where the main object is to exclude the air. Their application requires some little dexterity of manipulation. Tar is a useful dressing in foot-rot, when the healing process has commenced.

A plaister composed of a pound of pitch and two drachms of bees' wax, melted together, and spread while warm on soft leather or linen cloth, is applied with much advantage to the heads of sheep which are sore from the ravages of the maggots of the fly. Some, as a precautionary measure, smear the head in May with this composition, and scatter a little wool over it; others sew the plaister round the head.

#### SALVING, OR SMEARING.

The practice of salving or anointing the skin of the sheep, after shearing, with some unctuous preparation, is not universal. It is, however, the ordinary custom in Scotland, and is, indeed, essential to the health and comfort of sheep exposed to bleak winds in open mountain districts, to heavy mists, and drenching and long-continued rains.

The primary object of smearing is the protection of the

skin from the wet and cold; and next, to promote the growth of the wool and improve its character. Besides these objects, there are others not unimportant—the prevention of the attacks of insects, the destruction of such as might adhere to the skin, and the healthy action of the skin or the removal of cutaneous affections, for which tar is very efficient. Tar, mixed with butter, in order to counteract its tenacity, is the ordinary salving material; and vast quantities of damaged butter are yearly sent to the grazing districts of Scotland, for the use of the sheep farmers. One serious disadvantage, however, attends the application of tar—it indelibly stains the wool; hence it cannot be used for white goods, and what is more, it will not take the finer and more brilliant dyes. Wool thus tar-stained is termed *laid* wool, and sells at a lower ratio than *white* or *unsalved* wool. Yet in exposed situations the necessity of salving is felt, and various unguents have been tried. Instead of butter, whale oil, as an adjunct to tar, has been used, and is recommended by the Hon. W. J. Napier in his *Treatise on Practical Store-farming*; but the tinge of the tar is not obviated by this admixture. Mr. Hogg says, “Of late, several compositions have been purposely and extensively tried, in which the spirit of tar has been substituted for tar itself. This has, in some cases, been complained of as too irritating; and there is no doubt that a too free use of spirit of tar is injurious and even fatal. Some of the salves, while they prove to be perfectly well adapted to flocks that are clean, have been found ineffectual either in curing or warding off the scab,—a disease which the common salve made of tar and grease seems effectually to resist. When a flock is perfectly clean, olive oil has been found to be the best substance for softening the fleece, and warding off rain and snow. For clean sheep, ‘Taylor’s Salve’ is also suitable, though some English staplers have condemned it. If a tar-salve were made so as to be free from the impurities of the tar, it might probably answer every purpose. The ordinary proportion of one cwt. of grease to a barrel of tar, might be increased to one and a half cwt.; and when melted together, the impurities of the tar might be suffered to subside and be separated. In this way the tar might not leave a stain upon the wool when scoured. Olive oil seems to impregnate the wool, or to adhere to it more firmly than any other kind of greasy matter; and it has been successfully employed by Mr. Sellar, of Morvich, a first-rate store-farmer in Sutherland.”

Mr. Hogg recommends the following unguent to be rubbed over every part of the animal, after shearing, with a currying brush:—

Train or seal oil, 4 gallons, Imp. meas.  
 Tar,  $\frac{1}{2}$  gallon, Imp. meas.  
 Oil of turpentine, 1 pint.  
 Mix.

Mr. John Graham, of Newbigging, perceiving the disadvantage of tar as a wool-stainer, and yet desirous of smearing his sheep, used the following preparation, in which the tar was omitted, yellow resin being used in its stead:—

Butter, 18 lbs.  
 Hogs' lard, 18 lbs.  
 Resin, 12 lbs.  
 Gallipoli oil, 1 gallon.  
 Mix.

This quantity he found sufficient for fifty or fifty-five sheep; and the cost of smearing each sheep was about  $4\frac{1}{2}d$ . He found this wool, when washed, equally valuable with the *white* wool; and it sold for a considerably higher price than the *laid* or tarred wool.

The importance of smearing or salving is undeniable. The use of a small quantity of some oleaginous or greasy application immediately after shearing is now generally acknowledged. "The protection which it affords to the almost denuded skin—its substitution for the natural yolk, which is not in its full quantity immediately secreted—and the softness which it will impart to the wool—are circumstances well deserving attention."

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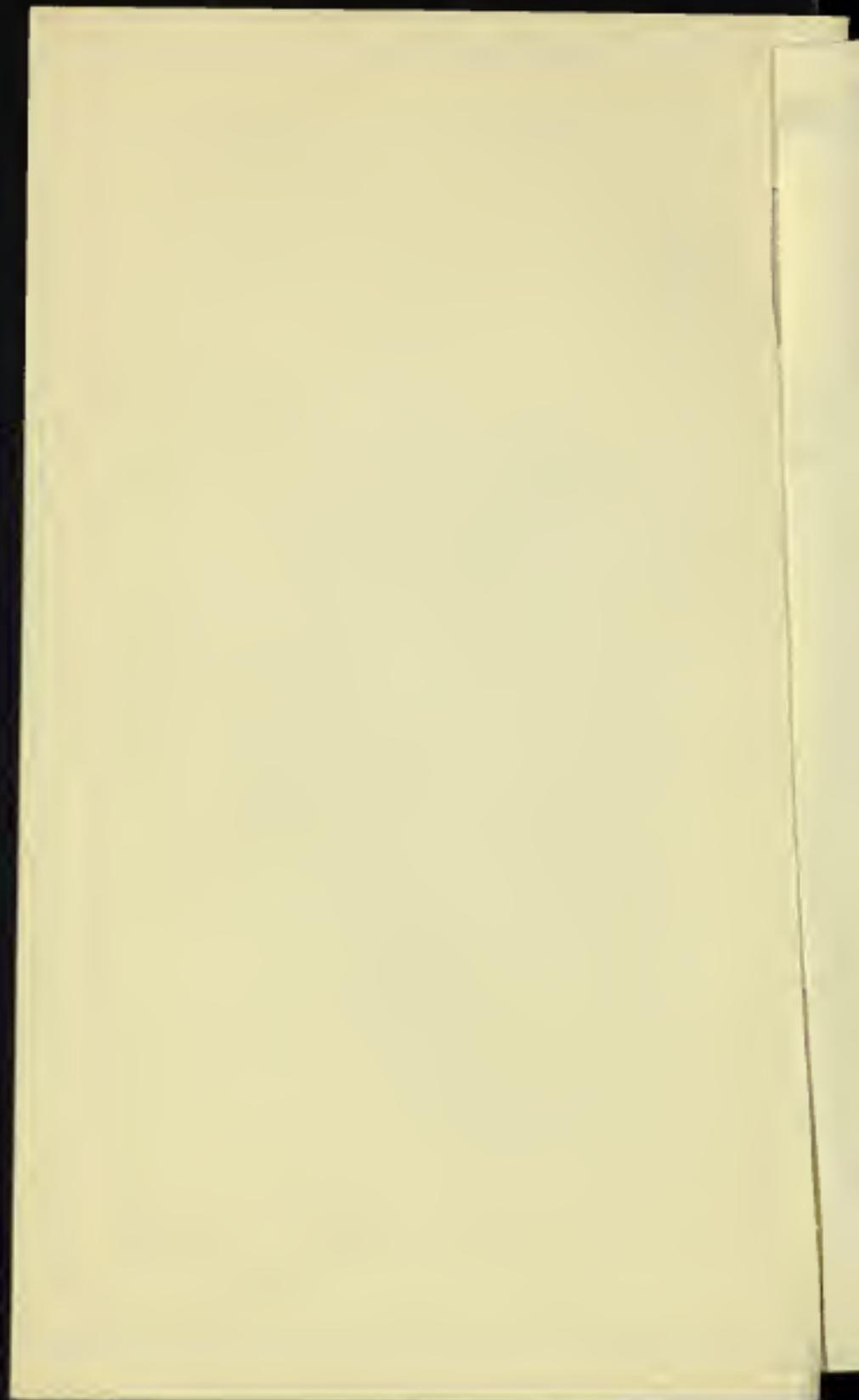
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