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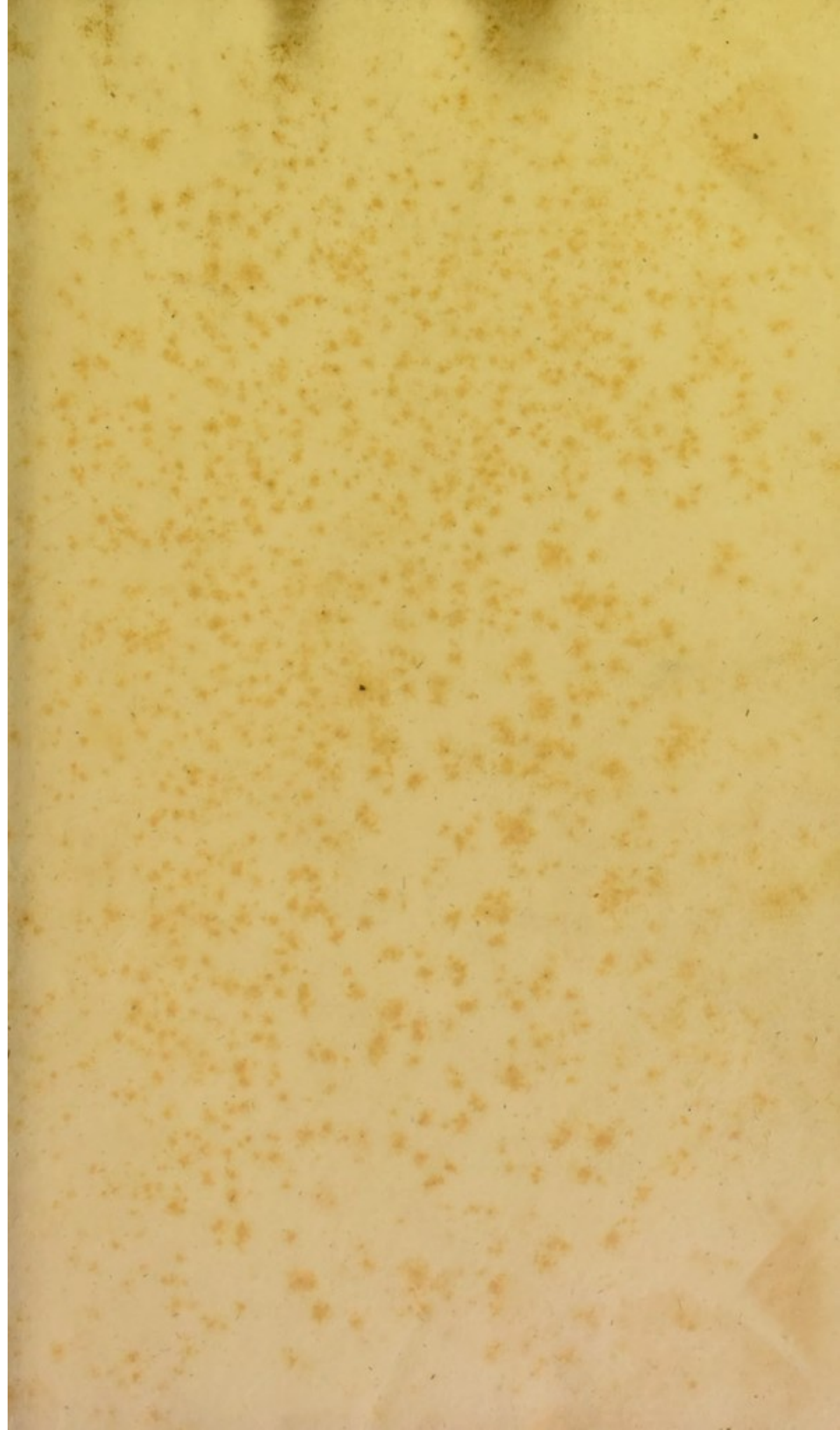
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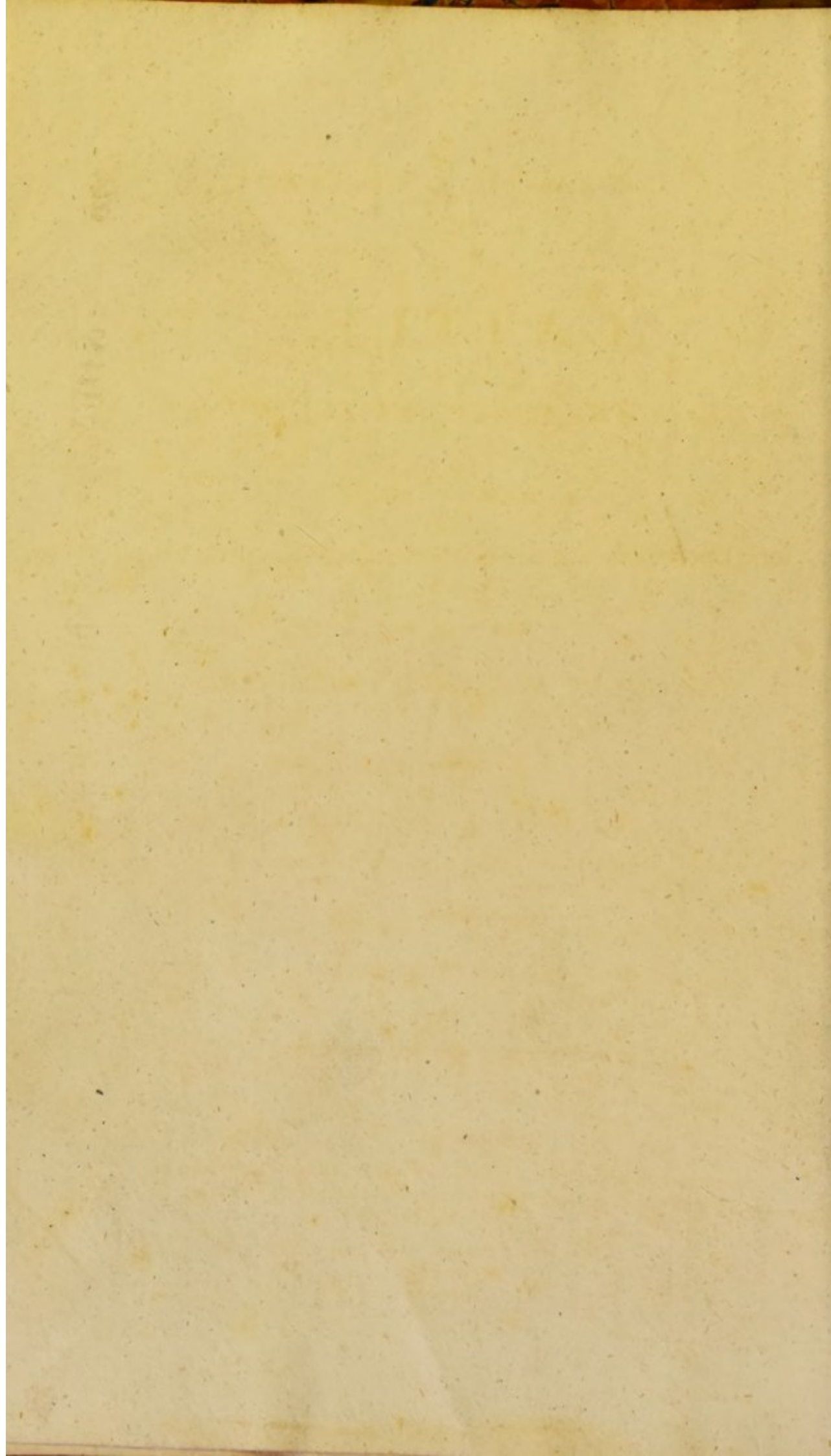


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A
GENERAL TREATISE
ON
CATTLE,
THE OX, THE SHEEP, AND THE SWINE:

COMPREHENDING THEIR
BREEDING, MANAGEMENT, IMPROVEMENT AND DISEASES.

DEDICATED TO
THE RIGHT HON. LORD SOMERVILLE.

BY JOHN LAWRENCE,
Author of the New Farmer's Calendar, Modern Land Steward, &c. &c.

SECOND EDITION, WITH ADDITIONS.

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STANDARD EDITION

CATTLE

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MANAGEMENT OF THE

STOCK

AND THE

BY JOHN LAWRENCE

Author of "The Cattle and the Management of the Stock"

SECOND EDITION, WITH ADDITIONS

LONDON

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TO THE
RIGHT HONOURABLE
JOHN LORD SOMERVILLE,

THE REAL PATRIOT AND FRIEND OF MAN;

THE STEADY, ACTIVE AND INDEFATIGABLE PROMOTER OF THE
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BY HIS LORDSHIP'S MOST HUMBLE,

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THE AUTHOR.

JOHN LORD SOMERSETT
RIGHT HONORABLE

THIS BOOK

THE AUTHOR

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ERRATA.

Page 324, Berks. Sheep, for long, read *middle* Wool.
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Monthly Review.



GENERAL TREATISE,

8c. 8c.

NEAT CATTLE.

ALL those which we style domestic animals must have been originally wild; some of them are, even at this day, in a state of nature, in various countries: the reason and the art of man, to which nature has submitted all things, constantly subduing the beasts of the field, select such as appear most profitable, and best adapted to the domestic state.

At the head of the domestic animals, in point of general utility, stands the genus *Bos*, by us commonly styled *Neat*, or the larger horned cattle, and sometimes *Black Cattle*. Their generic character, according to Pennant—‘Cloven footed, with or without horns, the horns bending out laterally; eight cutting teeth in the lower jaw, and none in the upper; skin along the lower side of the neck pendulous; rounded horns with a large space between their basis.’

A concise classification, or division of the animals of which it is proposed to treat, into *genus*, *species*, and *variety*, *permanent* and *accidental*, will be sufficient for the purpose of precision. By *genus*, we intend

original and distinct kinds, which can generate, progressively, only with its kind; as the genus of neat cattle, of swine, of sheep: by *species* is meant the original, or the most remarkable divisions of genus: as in the horse genus, the racer and the cart horse; in neat cattle, the bison and the common European species, also the long and short-horned: in sheep, the coarse and long, the fine and short woolled: in swine, the lop and prick eared. From the intercopulations of different species proceed varieties; these, being accidental, run into an endless diversity of form, which baffles all speculation: *permanent varieties* are such as have been effected, or preserved, in their acquired and distinctive character by the efforts of man.

Variations of form may also be classed as permanent and accidental; the first affecting species and specific distinction can be induced by intercopulation solely; the latter is perpetually resulting from the diversities of food, of soil, and climate. By the term BLOOD in cattle is *generally* understood an approach to that symmetry and delicacy which distinguish the race-horse and the deer; *particularly* the distinctive character of any fashionable variety.

The species of neat cattle, in course, varies in different climates and countries, from the influence of various operating causes, the attempt to develope which, would be a matter rather of curiosity than of certainty and real use. The grand specific distinction in their genus, made by naturalists, is that of the *urus*, *auroch*, or common bull of temperate climes, in its natural wild state, and the *bison*, or bull, having a bunch between his shoulders, generally indigenous in hot countries. This bunch, in some large cattle, reaches the weight of forty or fifty pounds, and is said to be an exquisite delicacy; but it is generally

much smaller. The supposition that this excrescence was occasioned originally by carrying burdens, and from such cause became afterwards propagated by generation, is truly fanciful and absurd.

Nec curtorum, per multa secula, Judæorum propagini, deest præputium.

No doubt ought to be made, that the bunch on the shoulders of the bison is one of nature's original and characteristic marks, although it appear much diminished during a low and impoverished state of the animal; that it is lost from intercopulation with the other species bearing no such mark, is perfectly in the course of nature. The bunch totally vanishes in two or three descents. On the other hand, the common species would indubitably acquire the bunch, by an intermixture with the bison. The elevated crest, and sometimes the lion's mane, is a nearly general characteristic mark of the *urus* or common bull, the former of which is, in individuals, retained to the latest stages of domestication, as we now and then see in the Devon, Alderney, and certain other races.

The various characters and aspects of this genus will best be learned by a detail of the most remarkable foreign varieties. The original *urus*, or wild bull, according to Buffon, (to whom chiefly we are obliged for the account of foreign cattle) has for the most part a curled and shaggy coat, the hair always long on the fore-quarters, neck, and forehead, and depending from the chin; the neck elevated, thick and short, and the tail long. Such description, it is probable, may apply with tolerable accuracy to the wild bull in most countries. The *bison* bears the same hairy marks, in his fore parts, with the addition of the bunch on his shoulders, but with the tail and legs short. The *urus* has established his species in

the temperate and cold climes, and generally throughout America, by importations from Europe; whilst the bison is as generally in possession of the southern parts of the old world: this last species is subdivided into the *zebu*, or dwarf *bison*, in Africa and the higher southern latitudes of India. Zebras, or Indian cattle, have been long occasionally imported into Europe, particularly to this country, and mixed with the native breeds.

The largest animals, of either species, are found in countries sufficiently temperate, or supplied with water to produce abundant products of herbage for their nourishment.

Upon the island of Madagascar, in Malabar, and other parts of India, in part of Persia, in the Ukraine, Calmuck Tartary, Upper Ethiopia, and Abyssinia, the bisons are of the proper, or large species; in several of the last-mentioned countries, their cattle are the largest in the world, attaining the height and size of camels; irregular as to horns; some entirely without, others with the horns large, either branching or pendulous. Specimens of the horns of the bison, of immense size, are preserved in the cabinets of the curious, some of them measuring three feet and a half in length, and seven inches diameter at the base. Great substance of the horn at the base is, I believe, a characteristic of the bison. These large oxen, when of a fine white colour, are generally purchased by the opulent, at a high price, for quick draught, in their carriages; and their horns being ornamented with copper rings, they are fed, clothed, and attended in the style of English race horses.

In the Hottentot districts of the Cape of Good Hope the natives not only use their bison oxen, which are of good size, for the saddle and draught, but train them to war, denominating them *backaleys*, which, in

their language, signifies war. These backaleys, it is asserted by authors, are endowed with the highest degrees of courage and sagacity. Being assembled, in troops, with a Hottentot army, on a given signal, they rush upon the enemy with the most impetuous fury, goring with their horns, trampling with their feet, and overturning every obstacle which opposes them. Individuals of them are also set to watch the flocks and herds, in the manner of our shepherds' dogs, which they faithfully perform like the dog, distinguishing friends from enemies, caressing the former, and attacking the latter with the utmost rage.

In America, on the banks of the Mississippi, the bison is found in its wild state in droves, and the inhabitants hunt them, esteeming their flesh good food. The new continent, as far as we know, originally produced nothing of this genus. It is presumed, that the bisons of America were imported from Europe; a fact which it is yet probable cannot be substantiated, since this species of the ox kind, anciently found in the forests of Germany, had disappeared from them previously to the discovery of America. The American bisons have, however, all the known characters of the species, differing only in their size, and the quality of their hair, from the influence of food and climate: thus in the high northern latitudes, from the effect of cold, their hair and beard is longer and harsher than in Mexico, and the adjoining countries, where their fur is finer than the best Spanish wool.

The interior parts of North America, westward of Hudson's Bay, produce also the MUSK BULL, which it is difficult to class, from the circumstance of its bearing a small bunch upon its shoulders. This species may probably have arisen from an intercopulation of the bison with the common or European species. The

flesh of the wild bull of the European continent retains the smell of musk likewise, the cause of which seems not hitherto to have been the subject of investigation.

The North American *musk bull* has been thus described by military men resident in the back country—lower, but with much heavier substance than the deer, and short legged. Bunch on the shoulder. Horns weighing from forty to sixty pounds, close, and large at the base; bending downwards, and verging out at the points, to the length of two feet and upwards. Hair of a reddish dun colour, fine, and long enough to reach the ground. Beneath the external coat of hair, the skin is covered with fawn-coloured wool, of such exquisite fineness, as to make stockings finer than silk. Tail three inches long, covered with long hair, of which the Esquimaux Indians make caps. These animals are very prolific and numerous, living in herds of several scores together. They delight in rocky and hilly countries, have considerable speed, and climb steep ascents, with much activity. Their flesh, which is brought down in sledges to the forts, during winter, is eaten, and esteemed good and wholesome food, notwithstanding its strong savour of musk.

Throughout the greater part of Africa, and the driest and least fruitful part of India, Persia, Great Tartary, and China, the zebu, or small bison, is kept; and is sometimes so small as not to exceed a yard in height, yet extremely useful for carrying burdens. These, however, are of little or no use, as milk-animals, generally losing their milk with their calves.

The *sarluc*, or grunting ox of Tartary and Thibet, where it is domesticated, from bearing the bunch, and generating regularly with the bison, evidently belongs to that species. Its chief distinction is the peculiarity of grunting like a hog, instead of lowing

like an ox; it has, however, other considerable variations from the common bison or zebu. The whole body is covered with very long hair, hanging down below the knees, and generally black, excepting the ridge of the back and the mane, which are white. The horns are short, upright, slender at the upper extremity, and very sharp like those of the zebu, the tail formed like that of a horse, but white and bushy. The animal strikes with its head, and is, in its wild state, extremely unruly and dangerous.

The tail of the sarluc, or, as it is called, whilst wild, the *bucha*, is sold at a very high price, both in Thibet and China. Being mounted in silver, it is used by the great, in India, for the purpose of driving away the flies; or fastened, by way of ornament, to the ear of the elephant; or died red, and formed into tufts, to adorn Tartar and Chinese bonnets.

In all parts of Europe and colonized America, and on the Asiatic borders, adjoining Europe, the species common in this country prevails, blended into a thousand adventitious varieties. The urus or wild bull, in colour black, with red and fiery eyes, short thick horns, hair bushy and curled upon the forehead, hide scenting strong of musk, and in size almost approaching the elephant, is found in the vast forests of Lithuania. The cow of this breed, although of great size, has the udder extremely small, compared with the tame cow; a general consequence perhaps with wild cattle, the milk of which is not forced.

The largest cows in Europe are said to be found in the fruitful pastures of the Ukraine; so lofty are these cattle, according to report, that it requires a man of the tallest stature to be able to reach the backs of their oxen. The fertile districts of Italy, Spain, and Portugal, feed a very excellent breed of cattle, not so remarkable for their large size as their good form. Of

the Portuguese bullocks, Lord Somerville writes with considerable approbation. In Lombardy, they have a handsome breed of white cattle. The pastures of Switzerland are famous for cows of large size, and high repute as milkers. That very heavy, coarse, and large-boned breed, usually fed in the marshes of Batavia, so distinguished for the quantity of their milk, comes originally from Holstein and Denmark. France has never been accustomed to feed large cattle; but the French breed, without being well-shaped, has always been highly esteemed for delicacy, producing fine beef and rich milk. The northern parts of Europe, particularly Iceland, and the Scottish isles and highlands, are celebrated for the smallest cattle, and the finest flavoured beef in the world.

In the scale of character, this genus of brute animals deservedly occupies the highest eminence in all respects. The bull equals the horse in strength and courage, and were the same pains taken with his education, would rival the horse also in docility, kindness, and attachment to man. The cow, when kindly treated, is a fond and caressing animal; the bison and zebu, probably, in a still higher degree than our common species. If it be wonderful to reflect, that the human heart can be gratified by the infliction of tortures upon the defenceless bodies of even insignificant animals, endowed by nature with the sense of feeling, our surprise and regret must be yet heightened at the indolence and apathy of, in other respects, even generous and enlightened men, who permit the most savage cruelties to be inflicted on the most useful, inoffensive, and mild of the brute creation. The practice of BAITING animals, as it is called, is here particularly alluded to. To stake down even the most noxious animal, with the view of deriving pleasure from worrying out its wretched life, with

prolonged tortures, is, at least, a temporary act of savage idiotism; to treat thus the gentle and docile bull, after a life of services indispensable to man, is a flagrant proof of treacherous, cowardly, and horrible ingratitude. The apology is as senseless, and void of all reason and truth, as the practice is abominable and inhuman.

I give place to the following anecdote, from a sense of duty, and by no means in a frame of mind, to treat the subject in a tender, still less in a ludicrous way. Far from thinking that the knowledge of flagrant acts of cruelty should be delicately hushed and suppressed, in my opinion, they cannot be proclaimed too loud, or disseminated too widely, for the purpose of raising a general abhorrence, exciting a due sense of shame, or imparting the needful information to those whom custom and prejudice hold in a contemptible and degrading state of ignorance. I dare trust myself with making few remarks; indeed the bitterest language of execration would fall far short of what is due to the enormities of the tale to be told; the senseless and beastly actors in which are, however, inferior in guilt to the cool, deliberate, and argumentative defenders of such infernal *games*. ‘November the 5th, last, at Bury, a bull, naturally gentle! which had in the morning, previous to baiting, been privately baited, and goaded with sharp instruments, in order to render him furious, though tied down with ropes, in his agony from being worried by dogs, and goaded by more inhuman dogs in human shape, burst his ropes, to the terror of his tormentors, and the no small danger of the peace of the inhabitants: after this, the poor beast was doomed to be the victim of the still greater barbarity of fresh tortures—he was entangled again with ropes, and, horrible to relate, his hoofs were cut off, and he again baited while he

had to defend himself on his mangled, bleeding stumps. The magistrates of Bury have repeatedly tried to prevent such infernal, demoniacal proceedings; but the demons are sanctioned, it seems, by AN ACT OF PARLIAMENT!!! Surely such an act is highly disgraceful to the age we live in, and to this country.' Extracted from a magazine; and sorry I am to observe, that no doubt need be made of its authenticity. Should this account chance to fall into the hands of actors in scenes like these, or into those of the still more guilty palliators of them (for hypocritical extenuation is infinitely the greater crime), I beg of them seriously to reflect on the possibility of those tortures, which they have thus wantonly inflicted, although upon a poor and friendless beast, intruding upon their minds, when their own bodies may be racked and tortured with disease, perhaps on their death bed, and in their last agonized moments. Will they *then* think, that the infliction of torments upon one animal ought to convey pleasing and mirthful sensations to the breast of another?

In point of utility and profit, no animal can stand in competition with the cow; a sentiment which has been universal from the primitive ages, and which, to this moment, has lost nothing of its force or truth. Her milk, so indispensable to civilized man, is her most precious product, and of which the value, in various forms, is so universally and feelingly understood. Of this real liquor of life, more valuable than the richest wines, the cow will give the amount of *many times her weight* in the course of a year, and every year, that she continues in a constant state of reproduction, unto the end of life, when her last gift to man is food of the most substantial kind, and so many articles of various use, that no part of her

carcase need be wasted or lost; the worth of these replaces, probably doubles, her original cost.

The flesh of the ox, whether for immediate use or preservation, has been too often celebrated to bear a new description. His tallow contributes to double the number of our days—his joints give us oil—his hide, leather of the strongest kind—his hair helps to cement the walls of our dwellings—of his horns, are made combs and toys—of his teeth, buttons—his bones are a cheap substitute for ivory, and their ashes serve to refine silver—his large, full eye is instrumental to the discoveries of the anatomist—his blood, gall, and urine, are of account in manufacture, medicine, and manuring the soil.

After all which has been enumerated, it remains yet to notice one of the most valuable qualifications of the ox, in latter times, most unwisely and unaccountably neglected. As a labouring animal, for agricultural purposes, he is, on the whole, far superior to the horse. This important position has been so repeatedly and irrefragably proved, that it ought, at this period, to be fully sufficient to make the assertion, to be no otherwise disproved than by a fair adduction of equivalent and contrary facts. If we can produce, in the ox, strength and weight enough for the heaviest, with speed sufficient for the lightest soils, and those joined with the highest degree of docility and resolution, what would the husbandman more? Let him under these circumstances make his calculation between the value of those benefits to be derived from the labour of the horse and the ox, taking into the account the less expensive keep of the latter, even when corn-fed, and that the profits of breeding and training for sale the labouring ox would probably equal the similar transactions with the horse.

The blundering absurdities published by theoretical advocates for ox-labour have served to mislead many, and to bring infinite prejudice to the cause. We have been gravely instructed, that the ox is fitted for the labours of tillage 'by the unwieldy magnitude of his body, the slowness of his paces, and the shortness of his legs!'—the very qualities which render him so totally unfit for the purpose, any otherwise than as a wretched substitute, and which afford the horse so manifest a superiority over him. Oxen of this description could only be advantageous for the labours of the field, in times anterior to the great improvement of horses; and the present character of the British labouring ox, is a direct reverse of the picture.

We may even go farther, and assert without the smallest impropriety, that we possess breeds of neat cattle in this country, well qualified, from their considerable powers of progression, for the ordinary purposes of quick draught, carrying of burdens, or even for the saddle. Such are the Devons, Glamorgans, and the lightest of the Sussex cattle. It is not improbable, that some of these are able to trot seven or eight miles within the hour. Three or four years since a Sussex ox ran four miles over Lewes course, for a hundred guineas, which he performed after the rate of fifteen miles per hour. Custom alone renders the use of bullocks for the saddle and the coach approved and unnoticed, or strange and ridiculous. Over great part of Asia, immemorial usage has established the propriety of employing oxen in both these capacities. They have, it is true, in those countries, the bison and the zebu, a species of oxen superior to ours in activity and facility of progression, but the comparison only proves these inferior, by no means useless, even for quick draught. Were it really an object with us

to make use of bullocks in this way, there can be no doubt of its success, if aided by an increased attention to their breed and training, and a due measure of that liberal treatment which they are accustomed to receive in India, where their travelling oxen are curried, clothed, and attended with as much solicitude, and much greater kindness, than we bestow on our best horses. The Indian cattle are extremely docile and quick of perception, patient and kind; like the horse, their chief travelling pace is the trot, and they are reported by those who have ridden them, often to perform journeys of sixty successive days, at the rate of thirty, to forty-five miles, per day. It ought not to be forgotten in favour of the ox that, like the generous horse, he is honest to the last, and never stops, or shows mulish or asinine restlessness and disobedience.

Much is said in favour of the mule and the ass, on account of the duration of their labour to so late a period, and a superiority thence challenged for the mule, even over the horse; but with the ox, age seems to form no question, he may, with the utmost truth, be said never to grow old, since his last value is superior to his first, and since the keeping of his successor is, in every view, a benefit to man, being an animal which exhausts not like the horse, but manures and improves the land on which he is fed.

The natural DURATION OF LIFE with the bull and cow may be stated at upwards of twenty years, to nearly the end of which the latter is useful with her milk, but the former usually loses his vigour, consequently his use, many years sooner.

The period of GESTATION with the cow, having a bull calf, is, according to the average of my own accounts, *two hundred and eighty-seven days*, or forty-

one weeks, with the variation of a few days, either way; a cow calf comes in about a week less time.

The cow, having TWINS of different sexes, the female is called a free-martin, and is said to be invariably incapable of procreation. I have ever entertained some suspicion of the correctness of this old notion, which seems to have little reason for its support, and conjecture that a female twin may possibly breed, although its associate be a male; as we know that cow-calves, singly born, occasionally prove barren. The free-martin, or barren heifer, to the best of my recollection, for I have not seen one for some years, has a bullish appearance about the head, horns, and neck, with a small udder. The different notions respecting the qualities of the free-martin show very plainly the dependence which may be placed upon them; by some their beef is represented as of superior excellence, by others as coarse-grained, flabby, and very bad.

The AGE of neat cattle is determined by the teeth and horns. They, as well as sheep, are destitute of teeth in the upper jaw; but the mark of age, as in the horse, is to be found in the corner incisory teeth of their lower jaw. The first front teeth, or calves teeth, remarkable for their whiteness, are shed at two years old, and replaced by others not so white. Every succeeding year two other calves teeth, next to the front, are also replaced, and at five years old, the incisory, or cutting teeth, being all renewed, are of good length, whitish and even, and the beast is full-mouthed. From this period, as the horse, the teeth are gradually filling up, until six years, when the mark is complete. The teeth afterwards become discoloured by age, and sometimes long and irregular. I know not what kind of calves, or of authority,

certain of our writers intend, when they talk of calves shedding teeth at ten months old. At three years of age, the horns are shed and replaced by others which continue. The indications of age from the horns are as follow : in the fourth year of the bullock's age, a kind of button, or ring, appears near the head as the bud or basis of the horn ; in the course of the year this ring moves, being pushed forward by another which succeeds it, a process which goes on to the end of the animal's life, its years being determinable by the number of these rings upon the horns, reckoning three years for the first ring. It is common with dealers to obliterate these rings, by shaving the horns, in order to conceal the age of the beast.

The HORNS of cattle are general designations of distinction and variety, and are supposed to denote particular qualities. Thus, English bullocks are distinguished as long, half long, short, and middle-horned, wide and broad-horned, polled or hornless. The grand distinctions, however, are the long and short-horned, which seem generally implicated with peculiar properties of milk and hide. Thus the long-horned cows produce a richer milk, in course, a greater proportional quantity of butter and cheese, and a thicker hide, than the short-horned, which last, however, afford larger quantities both of milk, beef, and tallow.

The flesh of the long horns is generally more compact and solid, and finer in the grain, than that of the short ; whilst in the last particular, fineness of grain, they are both far excelled by several middle-horned varieties. Mr. Culley, I apprehend, is mistaken in supposing the short horns the quickest feeders, an opinion totally incompatible with the fact of their being also more productive in tallow. Exceptions will however of course be found.

These distinctions are more apparent in the stock of Yorkshire and the Midland countries, yet their peculiar properties certainly influence, in however small and imperceptible degrees, the whole stock of neat cattle in this country and Ireland: whether they prevail with the same effect, in the cattle of other countries, I am unable to ascertain. But this rule, like all others, has its exceptions, and in the present case the Norman and Alderney cows present a very strong one; with short horns, they afford a very rich milk, it is averred equal, in that respect, to the best long-horned cows, with a larger proportional quantity. Large or long horns generally indicate thickness of hide, of which our Lancashire and Shropshire cattle are eminent examples. It is remarkable that the horns of the cow are usually more extensive than those of the bull, those of oxen still larger than either.

The COLOUR of cattle seems perfectly immaterial, in the view of utility, unless we allow the common exception of white and light colours, on the score of tenderness. The old prognostics drawn from colour were truly nonsensical. I have frequently seen black cows the largest milkers, and have at this time before my eyes an ancient one of Holderness, milking herself gradually to the dogs at the rate of nine gallons in a day.

The most usual APPELLATIVES, at this day, are—ox, bull, and cow. Bull and cow calves. A young castrated male, after the first year, is called a stot, stirk, or steer—at five years old an ox. A female, after the first year, is called an heifer, or quey; at four years old, a cow. And afterwards, a castrated female is called a spayed-heifer or cow. Certain of the Welsh and Scots cattle, of rather a coarse and sturdy kind, are denominated runts. Bullock is the

general term for any full-grown cattle, male or female, fat or lean.

Britain and Ireland, in the earliest periods of which we have any account, abounded in flocks and herds, and in horses, but particularly herds of cattle, in which the chief riches of the inhabitants consisted. Ireland is at this day, the greatest breeding country in Europe of neat cattle, and no where upon earth is there to be seen such an assemblage of them, as at the fair of Ballinasloe, where thirty thousand head of cattle have been exposed to sale in one day.

Of what particular species our British cattle may have been in very remote times, is now a matter of mere curiosity, to the developement of which we have, however, a tolerable clue in those breeds, which we know neither have, nor from circumstances could possibly have had, any considerable foreign mixture, and in course have remained nearly in their primitive form. These are the Highland Scots and Welsh, the North Devons, and the long horns of the north-west: these last, if not originally native of this island, must, in some remote period, have been imported from Ireland, since the native stock of that country are all long-horned, and since we know of no other country in which cattle of similar form and size of horn are produced,

Our original cattle then, it may be presumed, consisted, both upon the hills and in the lowlands, of long and middle-horned varieties, but probably of no short-horned cattle, a species which has been imported from the opposite continent. The pure and primitive races, of which there now exists no possibility of extending the number beyond those already noted, have not perhaps much varied from their original standard of form, but may have increased in size with the advancement of agriculture; and from the superiority of

modern care and feeding, the aggregate of our live stock is also doubtless much improved in bulk and substance, and blended into more numerous varieties from perpetual crossing. Polled cattle are said to have been originally introduced from Poland, which doubtless may have been the case with a considerable number; but as defect of horns is one of the primitive characters of the genus, it is not improbable that there existed originally upon this island, a mixture of hornless cattle, although they are now so blended with other varieties, with which they seem to hold affinity in form and qualities, that it is impossible to discover the real prototype. When it is asserted that this, or that, were the original race of the country, it can only mean in a restricted sense, since there can be no doubt but there existed a considerable number of breeds or varieties in the earliest times, of which the breed quoted may have been one.

On the FORM of cattle, I must beg permission to make the following extract from the New Farmer's Calendar.

“General symmetry and harmony of parts; that is to say, an equal and proportional union of length, depth, and substance;—the head not large, or long, but neatly shaped;—eyes full and clear;—neck not long, but inclining to thinness, decreasing, or tapering towards the head;—chest wide and full; legs by no means long, fore ones straight, the shanks clean and fine;—feet even and sound, the toes turned neither in nor out;—girth deep;—back and loins straight and broad;—belly capacious, without swagging;—quarters deep and capacious, the flesh reaching down to the hocks, from which, the legs forming an angle, the feet will stand sufficiently under the loins; distance as great, at least, between the hinder as fore feet.

“A very few comments on the above text will

suffice even those, who have but slightly considered the subject. Inequality of parts betokens weakness and imperfection, whereas just and equal proportion, is the truest indication of strength, and of ability in the animal, to produce, and stand under the greatest possible load of flesh. Should there be a deficiency of length and depth, we shall not only experience a deficiency of general weight, but of lean, by far the most valuable part of the animal's flesh. Short and round animals, although quick feeders, and of hardy constitution, fail in weight, and are apt to produce entire masses of fat: and the whole body being, as it were, crowded into the form of a tun, we in vain seek that depth and substance in some of the noblest parts, which are to be found only in a well-proportioned carcase. On the other hand, the carcase being too long, denotes delicacy, inaptitude to fatten, a demand of much food, and great length of time. The loins being narrow and thin, and the feet standing too close, are both signs of weakness, and very unsightly defects. When the fore legs approach too near, it may be presumed, from the consequent narrowness of the chest, there will not be sufficient room for the action of the lungs, during the period of fattening; and that the risk may be incurred of that common accident, their adhesion to the ribs. Sickly, or crooked hams, or the standing out too far off the hinder legs, that they appear to drag after the body, are very unfavourable indications, and of a most disgusting appearance in any animal. Thus, whatever be the height, or size of the beast, the three grand requisites of form, are the proportional union of length, depth, and substance, which assures the inherent and desirable qualities of each. The peculiar points of each species of stock, will ever be found in a

perfection, commensurate with the general good shape of the animal.

“ In the above detail we have been confined to the characteristics of strength and utility solely, leaving untouched the lines of beauty, which may be defined to consist chiefly in the oval form, or in the neat rounding of the parts. Thus in horses and neat cattle, particularly, instead of that excessive squareness and flatness of the shoulder, the side and the buttock, depth ought to be relieved by a gentle fullness and swell, which are the tokens both of beauty and substance; nor should there be any sharp, boney protuberances, either upon the shoulders, or hips, to offend the eye, by detracting from the plump and even proportion of the form.

“ Our object with cattle being simply that of fattening their carcasses, it may be observed, that any strong and healthy animal, however awkwardly proportioned, will answer the purpose; which is, indeed, true; but it is no less true, and has been confirmed by all experience, that attention to form is rewarded by quantity of product. The general indications of health, in the hairy animals, when in a lean or store state, are suppleness of the skin, and gloss upon the coat: in sheep, perhaps, brightness of the eyes, liveliness, and good plight, are the only signs to be depended upon.”

The signs of the true MILCH-cow, or the indications of copious milking, in whatever species, are a capacious and thin udder, large teats, with a large and distinct milk-vein; these are generally accompanied with a fineness of the head and chops; thinness of the neck, and somewhat gaunt and meagre appearance of body, promising no great tendency to fatten. In common, when great tackle is found, that is, a

large and fine udder, sufficient milking need not be doubted. The common minute descriptions, ancient or modern, of the milch-cow, have much more of the whimsical and irrelevant, than of the pointed and useful in them.

Such are my own ideas, generally, on the subject of form; here follows the opinion of one of our most distinguished judges, as to the true form of the male of that animal, in particular, of which we are now treating.

Mr. Culley's description of a BULL. ' The head of the bull should be rather long, and the muzzle fine; his eyes lively and prominent; his ears long and thin; his horns white; his neck rising with a gentle curve from the shoulders, and small and fine where it joins the head; his shoulders moderately broad at the top, joining full to his chine (or crops) and chest backwards, and to the neck vein forwards; his bosom open; breast broad, and projecting well before his legs; his arms or fore-thighs muscular, and tapering to his knee; his legs straight, clean, and very fine-boned; his chine and chest so full as to leave no hollows between the shoulders; the plates strong, to keep his belly from sinking below the level of his breast; his back or loin broad, straight, and flat; his ribs rising one above another, in such manner that the last rib shall be rather the highest, leaving only a small space to the hips or hooks, the whole forming a round or barrel-like carcase; his hips should be wide-placed, round, or globular, and a little higher than the back; the quarters from the hip to the rump long, and instead of being square, as recommended by some, they should taper gradually from the hips backwards, and the turls or pot-bones not in the least protuberant; rumps close to the tail; the tail

broad, well-haired, and set on so high as to be on the same horizontal line with his back.'

The following description seems to accord, as nearly as possible, with the ideas of the celebrated Bakewell. It delineates that barrel shape, which he supposed most advantageous for all kinds of animals, intended to be fed for slaughter, or even used for labour; and such probably was the original form of the Lancashire long-horned cattle. 'A round, tight, cylindrical carcase, wide in the hips, but very little prominence in the huckle bones, straight on the back, well filled behind the shoulders, a neck long and fine, without any superfluous skin underneath (or dew-lap, so much admired by the ancients,) the horns long, taper, and bending downwards, and of a deep yellowish colour, the head fine and smooth, long, and yet small, short legs, standing wide and firm, the tail fixed in a medium, not so high as to interfere with the straightness of the back, nor so low as to leave any want or vacancy in the line, the ribs forming a regular convexity, particularly that called by the graziers the first rib, but more properly speaking the last, it being the hindmost in the beast.' Animals thus formed are doubtless hardy, require a less proportional quantity of food than more loose, or indeed deeper and squarer shapes, and feed more quickly; but the barrel shape has yet its countervailing defects, and seems, since the days of Bakewell, to have lost ground.

That the reader may compare the above ideas on this subject, with those held by the ancients, I here present him with the sentiments of the celebrated Columella, on the nature, varieties, and true form of the cattle of Italy in his time. He begins the first chapter of his sixth book, by saying that 'it is not an easy matter to tell what things are to be observed,

and what to be avoided, in buying of oxen; seeing cattle derive both the habit of their body and the disposition of their mind, and the colour of their hair, from the condition of the country, and the constitution of the climate. The Asiatic have one form, the Gallican another, and those of Epirus a third; nor is there only a diversity in those of the provinces, but in Italy itself, also, they differ in its several parts. Campania, for the most part, breeds white and slender oxen; nevertheless they are not unfit for labour, and for cultivating their native soil. Umbria produces such as are huge, and of a white colour; the same produces also such as are red, and they are no less to be approved for their temper and disposition, than for their labour: the Apennine mountains, such as are exceeding hardy and sturdy, and which endure any kind of hardship, but are not comely, nor beautiful to look upon. Since in these there is so great a diversity and variety, the ploughman, in buying bullocks, ought to observe some common and certain precepts; and these, Mago, the Carthaginian, has transmitted to us, as we shall hereafter relate.'

'Such oxen are to be purchased as are young, square, with huge members, lofty horns, and somewhat blackish and robust, with a broad and curled forehead, hairy rough ears, black eyes and lips, wide nostrils, a camôys (turned up) nose, a long and brawny neck, large dewlaps, and almost hanging down to their knees, a great breast, vast shoulders, a capacious belly, and as it were great with young; extended sides, broad loins, a straight and even back, or somewhat subsiding, round buttocks, with compact, well-set, and straight legs, but rather shorter than longer, and not with big and ill-shaped knees; with great hoofs, and exceeding long bristly tails, and the

hair of their whole body thick and short, of a red or dark colour, and exceeding soft to the touch.'

The 'common and certain precepts' of Mago, the Carthaginian, respecting plough-cattle, on which so much dependance was placed by Columella, are totally unworthy of transcription. They consist of mere arbitrary marks, bearing no sort of relation to any principle of utility, in point of form, the grand defect in all the ancient descriptions of cattle. For example, what possible connection can subsist between 'lofty horns, broad foreheads, hairy ears, black eyes and lips, and turned-up noses,' and abilities for draught. And granting, that in any particular race, such marks were the usual concomitants of the desired qualities, it is a poor theory which depends on adventitious or local and transitory circumstances, instead of fundamental and permanent grounds. Doubtless, in these old descriptions, we find some principles of utility, but they are few, given in so vague and general a way, as to leave the inquirer quite at a loss in the view of useful application. The absurdity will immediately appear of introducing these ancient rules into modern treatises on cattle, which, however, prevailed until of late years. Nothing surely could be more necessary to improvement, or rather it was the very essence of it, to define with the utmost practical precision, that form in animals which is the most conducive to the furtherance of those purposes for which they are intended: a fanciful or presumed beauty, independent of true symmetrical proportion, forms no part of the modern British system, either of jockeyship, or cattle science.

The general form of animals here exhibited we have doubtless acquired by experience in Nature's best models. Animals, in fact, may be moulded by procreation into almost any form, or endowed with

any property, not alien to their genus: as a general rule, subject to exceptions, the young resemble their parents in form and properties, in the common phrase, *like produces like*. The ancients supposed, that in the communication of qualities most depended upon the dam, an idea which seems to be reversed by modern speculators; it is, according to my experience, a matter of much uncertainty.

By IMPROVEMENT of the breed of animals is meant the gradual change of form and property, in their progeny, until they shall arrive, as nearly as possible, to a certain standard of presumed perfection. This is to be effected on the principle of *like producing like* by a conjunction of male and female, of the desired species, form and properties, some steps or points being gained in every procreation. The male, of course, being able to multiply likeness to such an extent, must be the prime instrument in the business; it is therefore of the utmost consequence that he be thorough-bred or thorough-shaped, and the female ought to be selected with the strictest care, since, although her qualities cannot be considered of so great consequence as those of the male, her likeness being restricted to an individual or two, yet, it must not be forgotten, that perfection is not to be attained, but from perfection on both sides: in this particular, the common breeders are very liable to err, confining their attention usually to the male.

Nothing can be more groundless than the notion 'that all breed goes in at the mouth,' inferring that all excellence depends on keep. It would be equally rational to say, that size and form depend on food. No fact can be better established than the reality of specific properties, and the superiority of one breed over another, of which fact a more complete proof was never exhibited, than by the comparison of the

Glamorgan oxen with the Devons and Herefords, in Lord Somerville's cattle shew of 1803. The former of superior stature, in equal health, and under similar circumstances of food and treatment, did not probably reach the weight of the latter by twenty stones each, the defect too, not fortuitous, but obviously ascribable to inferior form. These, however, I think, appeared mongrel, or crossed Glamorgans; probably they ought rather to have been called Pembrokes.

The formation of an entire new breed, or the establishment of a permanent variety, it will immediately occur, is a matter requiring the most diligent attention, through a long course. For that reason, it is infinitely the shortest and safest course to part entirely with an inferior stock, or such as requires much amendment, and to replace with a species, the nearest to perfection, at whatever price. We thus account, rationally, for the high price of certain well-bred individuals, which may be strictly their due. A ram, which from his perfect shape and quality, will improve his progeny immediately, to the amount of one quarter additional value in each individual, taking into the account the extent of the compound, progressive improvement, may be far cheaper at fifty, than a common-bred one at a single guinea. The perfecting stock already well-bred is a pleasant, short, and easy task. A blind prejudice in favour of the peculiar breed of the district, or of those to which a man is attached from mere custom, is one of the greatest bars to improvement: breeders devoid of science or information are ever apt to over-rate the worth of their own animals, a folly which can only be cured by fair comparison.

Individual variety of size and shape prevails in all breeds, to the infinite use and convenience of man. Thus, in an established large breed of cattle, there

will still be gradations of size, suitable to various soils and purposes. There will be also in every species (a prime consideration) individuals which run naturally to length and depth of carcase; others which have a tendency to the contrary form, with much substance, wide loins, and short legs. Many intire species also may possess certain of these, as distinctive properties. The improving breeder, in joining the sexes, will take advantage of those varieties of shape, or peculiar properties; increasing length and depth of carcase when required, or moderating too great length with its opposite, with rotundity of form, and width of loin, and shortness of leg: ever having especial regard to preserving *substance* in the form of his stock, and to prevent the increasing length, and too near approach of the legs. It is very common for our best breeds to degenerate in this way, from neglect; in which case it will be necessary, to change the males for others of a still shorter and more substantial form, either from the same or a kindred variety, and to pay an increased attention to the selection of females.

Long experience has proved the old notion of the necessity of crossing, or interchanging the species of animals and seeds, in order to prevent degeneration, to be totally groundless. You may breed for ever, *in and in*, or from the nearest affinities of blood, with the utmost success, provided you select, with judgment, the best shaped individuals; and the finest animals of this country have been bred in this mode: in truth, since like produces like, the best shaped, however allied in blood, must be the most proper for conjunction; a cross for the improvement of forms, is a very different, and may be a very necessary measure: yet crossing is said, and probably with truth, to produce, in the *first instance*, larger size and improved temperament.

It is probably more advantageous to adhere to established species, or varieties, possessing innate and peculiar good properties, than to cross, with the view of the division of properties; at least, I conceive it to be generally so. Thus, probably, the long and short horned cattle are preferable in their separate state, to the variety which results from their mixture; amongst horses, those hackneys produced from their own species are superior to such as are engendered between cart and racing stock. Certainly, no incongruous and random crosses can be made with improvement, yet, as every rule admits of exception, such crosses are continually making, and ever must be, and very useful stock are so produced, however inferior to the regular breed, and to such as have been the objects of a careful selection.

The much-disputed question of the size of cattle, involves such a multiplicity of considerations, that the attempt to determine it would require a discussion of considerable length, grounded on an ample series of experimental facts. It may be, however, safely affirmed, that, in general, where food is in plenty, a large market accessible, and a demand expected, full-sized stock will render the largest profit. It is by no means an infallible rule, that the appetite and demand of food is in proportion to size and weight, the contrary frequently happens, and the superiority of *growth*, in the large breeds, seems an advantage too considerable to be compensated by the more speedy fattening of the small: nor is it always to be depended upon, that small cattle will make a higher price per pound than large in the London markets. I have lately seen bullocks of six score stone, rather a coarse commodity; and highland Scots, which would scarcely average at forty-five stone, sold in Smithfield at very nearly the same rate per stone.

All animals will fatten early, and quick, in proportion to the smallness of their bones, with the disadvantage, however, of running too much to fat, and falling short in the quantity of solid flesh, in course, of weight; hence the private advantage is not so great as generally supposed, and the public disadvantage sufficiently apparent. Large bone, and a well-shaped capacious frame, are necessary to the growth of flesh; and fat, in plenty, both externally and internally, will follow, granting sufficient time be allowed. Tallow, or internal fat, which denotes the ripeness of the animal, results from mature age, length of keep, and, probably, from size of bone and depth of carcass. I have yet seen South Down sheep well tallowed within, with a very moderate quantity of external fat.

Large round bones, vulgarly styled, 'gummy,' indicate a coarse and open-grained flesh; but the produce is generally plentiful. Such are the Lincolnshire cattle. Bone may, however, be fine, that is to say, flat and symmetrical, yet sufficiently large; and thus it is in our best bred stock. The intent of foreign, particularly southern crosses, has been to introduce this fineness of bone, and, with it, delicacy of flesh. It is difficult, however, to conceive in what respect the hard, black, and dry flesh of the cattle of hot climes can improve, by the cross, the flesh of the British cattle; recollecting further, that the milking property must be deteriorated, since all cows from hot climates are scanty milkers.

The original or established Species, or Breeds of Cattle, in Britain, with their permanent Varieties, as they are found in the Beginning of the Nineteenth Century.

The DEVONS. From these have derived the HEREFORD, old GLOUCESTER REDS, and SUSSEX.

The KENTISH HOMEBREDS.

The WELSH MOUNTAIN AND LOWLAND CATTLE.—Isle OF ANGLESEY.

The LANCASHIRE, OR NORTH WESTERN, AND MIDLAND COUNTY LONG HORNS.

The SHROPSHIRE WIDE HORNS.

The NORTHERN SHORT HORNS, OR TEESWATER, LINCOLN and HOLDERNESS, OR YORKSHIRE SHORT HORNS.

The NORTHERN HALF LONG HORNS. The POLLED.

The NORFOLK HOMEBREDS. SUFFOLK DUNS.

The SCOTTISH ILSAND, MOUNTAIN, AND LOWLAND CATTLE.

The WILD CATTLE OF ENGLAND.

The ALDERNEY AND IRISH CATTLE.

The celebrated RED CATTLE OF DEVONSHIRE are thus described in the Annals of Agriculture, No. 172, by Lord Somerville, an exquisite judge, and a native and resident of the country in which these cattle are bred. His lordship first observes, that “to describe the breed, not as they might be, in imaginary individuals, but as they really are found, it may in general be observed, speaking of this, as of all other breeds, that conclusions must not be drawn from the shape and size of the bulls, but from the general quality of their stock. Certain it is, that, individually, handsomer bulls are often to be found in other breeds; and it is as certain, that this race, of which the WHOLE PRODUCE is brought to view, stands the confessed favourite, or among the very first, at Smithfield, where prejudice cannot find the way. And in forming an estimate of merit or demerit, the annual produce is to be the object attended to; this in oxen, which for superiority of grain, activity in labour beyond all competition, and what in horses is termed blood, will be found a right criterion to judge of the bulls which got them.”

“Beginning with the SHAPE OF THE BULL, in any

very handsome individual, the horn is found neither drooping too low, nor rising too high, nor with points inverted, called here *stag-headed*; tapering at the points, and not too thick, or *goary*, at the root; the colour yellow, or waxy. The eye clear, bright, and prominent; looking well behind, and shewing much of the white:—a dead-eyed ox not often a good prover, or fine in skin:—an occasional variation of colour round it. Forehead flat, indented and small:—this found almost universally in this breed, and is a point that shews much blood. Cheek small, and muzzle fine:—if the forehead is fine, the muzzle is so too. The nose of a clear yellow, if possible like the horn, or mottled:—a black nose always to be avoided; for although occasionally a black-nosed ox may bear work, and die well, yet it is a point often demonstrative of a bad constitution, of such as turn scourers or *skinters* provincially, and particularly when the cast of the coat is of too pale a colour. The nostril high and open. In respect of throat, the bulls of this breed are sometimes reproached with being *throaty*, or with the skin too profuse and pendulous. The hair curled, giving an apparent coarseness to the head not to be found in the New Leicester bulls, when carefully trimmed with scissars. The neck perhaps thick, and *goary*, in the estimation of strangers, with which property the oxen of this breed are not to be reproached, or they would not labour as they do.

“ Generally speaking the bulls are, relatively to oxen, not of a large size: and it should be observed, respecting size in general, that nature operating in food and climate, is imperious, and will produce oxen proportioned to those two circumstances in due course of time, whatever may have been originally the size of the bulls and cows.

“ Here end the points wherein there is any essential difference between the bull and the ox ; the variation in others is small and unessential : a remark which is, however, subject to limitation ; for individual instances will occur, which, if too much attended to, would seem to establish a different rule.

“ The neatness of form, and energy and vigour in labour, greatly, if not wholly, in this breed, arose from breeding by heifers, and year old and two year old bulls. Although an old ewe may produce a finer lamb than a younger one, yet the quality of vigour is unnecessary and extraneous to sheep. — This is a prejudice deeply rooted in the minds of all practical men ; although much, in the estimation of some, may be given to climate.

“ Compared with the horse, the shoulder is low. It should correspond with the general thickness of the animal—on no account projecting. If a bullock is *in-kneed*, or bending inwards towards each other, the point of the toe must be *out* ; the point of his shoulder must be the same ; and he must be hollow behind the withers, (an incorrigible point in an ox for feeding,) and he must be, of necessity, a slow worker.

“ The bosom is not sharp, with a loose, pendulous dewlap ; but wide in form, and mellow in handling. In buying an ox great notice should be taken of the breadth of the bosom, and between the fore-legs, standing quite wide, the legs like straight pillars supporting a great burden. Much in buying is lost or gained by attention to this point : it is not for symmetry only, but implies strength and speed ; a proportionate breadth of breast giving wind : and here we find the application to a working ox.

“ The legs are straight ; and the more blood an ox shews, the smaller will they be. The circumstance of this breed shewing more blood than any other in

the kingdom, has been remarked by many persons ignorant of cattle, but deeply skilled in horses. The leg neither too long, nor too short: an undue length is to be avoided.

“ Very much of a bullock’s proof is admitted, on all hands, to depend on the size of the rib, rotundity of the barrel, and mellowness of the skin. These are the first points to handle, in a lean and in a fat ox. The two hind ribs should be bold, prominent, and widely independent of each other. The skin rising easily from the ribs, mellow, and *elastic*, affording room to lay fat on below it. A man buying a lean ox would do well to handle him on both sides; it often happens, that the frame or barrel is not equally round on both; one evidently to the eye and hand flatter than the other.

“ The hips, or pins, lie so high as to be on a level with the back, either in a fat or lean state; by no means dropping. The older the animal, the lower the upper flank drops, and, consequently, the higher the hips appear. In this point of the upper flank, a skilful judge will discover much of the inward properties of a fat bullock. The hind-quarters from the pin to the catch, or point of the rump, should be long and well filled up: handling the centre of this space is a leading feature in the estimation of choice judges, and ascertains more of the substantial quality of the flesh and fat of a beast, than the prominence of fat so much admired by bad judges on the catch of the rump.

“ The setting on of the tail is on a level with the back, something elevated, nothing depressed: size long, small, taper, and with a round bunch of hair at the bottom; the tail, as in a horse, denoting much of high blood.

“ The gaskins are not too much cut away, nor, as in the Holderness breed, heavy and loaded; bearing

always in mind, that these oxen are not bred for inactivity, but for wind, vigour, and strength: for although a breadth in the bosom, inasmuch as it is essential to wind, in a working animal, is beneficial; yet a load of flesh on this hind part tends nothing to activity; and, being of second-rate quality, is not desirable for profit.

“ In point of skin they are among the thinner classes, rather than the thicker. It is very rarely that an ox is found with a hard or wiry skin. Much depends on colour: the shades most admired are the mahogany; and the more glossy silkiness, if smooth, the better. Those with curled hair are deemed excellent provers, and a very glossy mahogany skin, paler or lighter, with curls like ripples of wind on a smooth mill-pond, is also in the highest estimation. It is hard to say which of these is the best; all turning out such numbers of good fat oxen. The paler shades, if the eye is clear and good, will bear hard work, and prove as well as any. This rule only is absolute, that a pale skin, hard under hand, with a dark and dead eye, too often denote a *skinter* in hard work, and rarely, under any indulgence, a good prover.

“ Respecting the lower flank, and the cod, they do not deserve that attention which many persons pay them, who consider these points of prime importance.

“ The graziers like this breed best at five years old. The worked-out steers of the vale sell for more, at five years, than at six: but six is the proper age. At eight, nine, and ten they are going back in all their points; and in their value after seven. No ox should be kept after seven, or, at most, after eight.”

I have already made a copious extract from this admirable memoir, written so much *con amore*, by the noble and patriotic west countryman. I yet leave it with regret, referring the curious reader to the

original. The following generals, however, must not be omitted.

“ They (the red cattle) are yoked at two or three years old, and lightly worked—labour increased at four, from that period to six, full worked.—Worked oxen attain a larger size than unworked, finish their growth generally at six years old, but the larger size grow the longest. According to Lord Somerville’s own practical experience, the pole and yoke form the true lever of an ox, and he can draw a greater weight, in yoke, than in collar and harness, particularly in a steep country.—The bullocks never come home in the middle of the day; a bundle of hay is carried into the field—all the calves of this breed reared.

“ These oxen are not parted with by the tillage farmers until the barley-sowing is over, and in many cases the turnip-ground once stirred, yet they are grazed fat, in six or eight months, to the average weight of forty-five score: those kept on after Christmas, fattened on hay alone, which in the grazing districts of the west is held equally nutritious with any sort of corn—oil-cake feeding not practised—these hay-fed oxen stand the drift to London, without waste. Instances of Marsh-feeding-heifers bought in April or May, quite poor, fit for the butcher by the middle of July; in August, uncommonly fine beef.

“ The station of this breed begins at Barnstaple, and is traced by pursuing the line of the river Taw, as high as Chumleigh, then to Tiverton on the Ex, Wellington, and nearly to Taunton. Then turning north, straight to the sea, over the eastern boundary of the Quantoc hills, to Stoke Courcy; from which place on the eastern extremity, to the mouth of the Barnstaple river on the western, includes the whole to the length of forty-five miles, and to the breadth, across from Tiverton to Minehead, of twenty-two. To the east

of this range, the breed gets into a mixture of Gloucester, Welsh, Upper Somerset, &c. being a varied dairy sample: and, more to the west, a Devon, verging on the principle of the Cornish stock. To the south, the variety of the south hams is found—coarse, with a good deal of white and brown, with black and white mixtures, of uncertain properties. Exmoor is the highest point of the district thus defined, the country shelving from it in every direction, the source of all the rivers, and the head-quarters of all the cattle. At Bampton and Wyveliscomb, they are found in great perfection.

“ FAIRS for the red cattle—Ashbrittle, (between the two counties; Devon and Somerset) Feb. 25, for oxen.—Bishops Lydiard, March 25, for ditto.—Barnstaple, Friday before April 21.—The great monthly markets of Taunton, Wyveliscomb, Tiverton, and Moulton, until the fairs of Crediton, May 11.—West Bagborough, the 12th.—Wyveliscomb, the 13th.—North Moulton, third Tuesday after May 11.—Bampton, Whit-Tuesday.—South Moulton, Wednesday before June 22.”

I have paid the greater attention to this race of cattle, in justice to their superior and well-grounded claims of antiquity, purity of blood, high form, and extensive utility. The red cattle of North Devon and Somerset are doubtless one of our original breeds, and one of those which has preserved most of its primitive form: the excellence of this form for labour is best proved, by the fact, that the fashionable substitution of horses has made no progress in the district of these cattle; by their high repute as feeders, and for the superior excellence of their beef, which has been acknowledged for ages. Robert Bakewell paid them the highest compliment they could possibly re-

ceive, by declaring to an enquirer, that the Devons could not be improved by any alien cross.

In my own opinion, the purest Devons frequently run to too great length of leg, crooked behind, or sickle-hammed, and of insufficient general substance. They are also, I think, more apt to be *in-kneed*, that is, crooked in the fore-legs; a defect analogous to that styled sickle-hammed in the hinder legs, or, as we say of the human animal, knock-kneed, than any other reputed race. A demonstration of inveterate negligence in respect of the form of the breeding animals, but which, by the old school, would have been attributed to a defect of crossing the breed. By a proper selection from their own stock, they might be bred somewhat more square and substantial, without at all detracting from their delicacy, shew of blood, or speed. Their labouring powers might be thus increased, and their quantity of beef, without either debasing its fine qualities, or rendering necessary a larger portion of keep. These cattle have generally, for a century past, commanded the best price at Smithfield; but of late years the buyers there have shrewdly remarked, that although blood and fine form are very pleasing to the eye of the gentleman breeder, yet substance and weight are, and ever must be, the grand objects at market.

The Devons are the speediest working oxen in England, and will trot well in harness; in point of strength, they stand in the fourth or fifth class. They have a greater resemblance to deer than any other breed of neat cattle. They are rather *wide*, than *middle-horned*, as they are sometimes called; some, however, have regular middle horns, that is, neither short nor long, turned upward and backward at the points. As milkers, they are so far inferior to both the long and short horns, namely, both in quantity

and quality of milk, that they are certainly no objects for the regular dairy, however pleasing and convenient they may be in the private family way. Yet they have been formerly used with success at Epping, in Essex, in one or two instances; as a balance to which, they are universally rejected by the dairies of their own and the neighbouring counties. It is, however, rather an anomaly, that they do not produce greater quantities of milk, considering their form, the thinness of their skin, and the meagre and milky appearance of many of their heifers: this is doubtless owing to their property of quick feeding. I must, however, take it for granted, that the South Devons, which, from known facts, as well as from appearance, have been so much crossed with Norman and Alderney stock, have considerable milking properties, of which I recommend the trial. Zealous as I have ever been for that which we call blood, both in the stable and in the ox-stall, it is now too late for me to regard the whims and vagaries of my boyish days. I have long since given up the idea of the general use of bred hackneys, and have learned, that the substantial is, at least, an equal requisite with the delicate, in an ox. Nothing surely could be more preposterous in speculation, than the idea of crossing Devon cattle, already sufficiently fine, with the Indian zebu; unless indeed with the view of raising a breed for carrying burdens, or for the saddle, in which case it is probable that the introduction of the bison would be a more effectual step. I have yet seen Devon heifers, apparently having Indian blood, squarer in form, and shorter legged, than the pure Devons, and equally well laden with flesh. Impartiality demands of me this avowal.

Mr. Young, in his last western tour, tells us of a breed of *natt*, or polled Devons, in the neighbourhood of Barnstaple. The opportunity did not occur to me

of viewing these cattle whilst I was in the west; but, on enquiry, they were described to me as coloured, middle sized, thick-set, and apt to make fat, but coarser than the true-bred Devons. If they have sufficient speed to be valuable for labour, there is certainly a convenience in the natural exemption from the incumbrance of horns.

The best bred North Devons, being a hill-cattle, are much more hardy, and better winterers, than could reasonably be predicated of their appearance. To indulge a curious conjecture, which I acknowledge is not of one farthing consequence, at present, true or false—after all, this famous race may be a permanent variety growing out of an original stock of black cattle of close affinity to the Welsh mountain, crossed, and rendered fine through a series of ages by Norman or Alderney bulls, or the descendants of such, easily communicating with the hill country from the Devonshire coast. The proud swelling crest is a characteristic of the Norman bull, and, perhaps, generally of southern stock.

The HEREFORDSHIRE cattle, obviously at this day a mixed breed, are, in general, supposed to have been originally of the Devonshire species. There are no documents existing, with which I am acquainted, respecting this presumed origin, or the succeeding crosses, or what length of time the present famous variety has been permanent; but its great size is doubtless derived from an intercopulation with the heaviest of the Welsh breeds, or with that of Shropshire, an adjoining county. A Welsh, chiefly a Pembroke cross, is now said to be much affected by the Herefordshire breeders. Are we to conjecture, that the Herefords owe their bald face to the smoky white faces of the red cattle of Montgomery, from which race, crossed with Devon bulls, originated the

celebrated one of which we now speak, their various colours arising from other Welsh crosses: or that the Montgomerys derive their smoky face, and substance, from an Hereford cross?

The following is the popular description of the Herefordshire breed, which, according to my observation, must be received with considerable reserve; however, there are certain peculiar prominent features of distinction invariably to be observed among them—the horns, the white face, a faintness or dullness in the colours, great substance, as well as depth of carcase, with (generally) a roundness of the bones.

“ The countenance pleasant, cheerful, open; the forehead broad; eye full and lively; horns bright, taper, and spreading; head small; chap lean; neck long and tapering; chest deep; bosom broad, and projecting forward; shoulder-bone thin, flat, no way protuberant in bone, but full and mellow in flesh; chest full; loin broad; hips standing wide, and level with the spine; quarters long and wide at the neck; rump even with the general level of the back, not drooping, nor standing high and sharp above the quarters; tail slender, and neatly haired; barrel round and roomy, the carcase throughout, deep and well spread; ribs broad, standing close and flat on the outer surface, forming a smooth even barrel, the hindmost large and of full length; round bone small, snug, not prominent; thigh clean, and regularly tapering; legs upright, and short; bone below the knee and hough, small; feet of middle size; cod and twist round and full; flank large; flesh every where mellow, soft, yielding pleasantly to the touch, especially on the chine, the shoulder, and the ribs; hide mellow, supple, of a middle thickness, and loose on the nache and huckle; coat neatly haired, bright

and silky, colour a middle red, with a *bald* face, characteristic of the true Herefordshire breed."

Such is the account Mr. Marshall obtained upon the spot, from the breeders and graziers, and it proves them truly enlightened on the subject. We have, however, seen, of late years, considerable coarseness of bone, even in the best Hereford cattle: that circumstance is of trifling, if of any, consequence, and they have proved themselves of such superior excellence, that no possible cross could be advantageous. The Herefordshire breeders would do well to reflect on the importance of preserving the old blood in a state of as great purity as possible, and to be ever mindful of Mr. Marshall's description. They possess, for some purposes, the most valuable breed of cattle in the world; they have been very judicious, or very fortunate, in nicely blending the elements of such a variety, but they ought not to forget, that, by further mingling and crossing with inferior stock, (and where will they find other?) they may, by degrees, recede from the great eminence they have attained. Should, however, a cross become really necessary, from too much coarseness or over-size, Devon or Norman bulls are undoubtedly the proper ones.

The distinguishing qualities of Hereford oxen are, the produce of beef, quick-feeding in proportion to their growth and size, and the union of strength and speed in labour. With respect to the most profitable return in quantity of beef, it may be presumed, no breed in England can stand in competition with this, and they have accordingly been most successful at the annual prize shews. They also command the first price alive or dead. The weight of Mr. Westcar's ox, which carried the prize at the Smithfield shew, in December, 1802, was as follows:

	Stones of 8lb.	lb.
Head, tongue, skirts, heart, and lights	13	2
Tripe, guts, feet, and liver	19	1
Hide	16	5
Blood	6	0
Fat	37	5
<hr/>		
Offals	92	5
<hr/>		
Fore quarter	72	1
Hinder ditto	65	2
<hr/>		
One side	137	3
Ditto	137	3
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Carcase	274	6
Offals	92	5
<hr/>		
Gross weight	367	3
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The northern short horns, generally called the Teeswater breed, are still of larger size than those of Herefordshire; but they are slower feeders, and it is said more expensive in keep. The Herefords are very conveniently various, as to size, but all require good keep. They are our most powerful draught oxen, yet speedy enough for any work, either at plough or cart, and will generally walk full as quick as their attendants find agreeable; as their meek and placid countenances indicate, they are docile and tractable, and, if trained with temper and kindness, will drive to an inch with reins. They are equally excellent upon the road, or at plough. As MILKERS they have nothing particular to boast.

The old GLOUCESTERSHIRE REDS AND BROWNS, if I

recollect aright, were middle horned, shewing blood, and resembling, in a considerable degree, the South Devons, but of a more square and substantial form. They were a mixed breed, shewed much Welsh blood, and were, it may be presumed, more apt to fatten than milk, since they have given way to the long-horned species in that dairy country. It would be difficult, at this time, to find any genuine specimens of this old variety; but every possible means will be used to procure specimens of their form for the National Cattle Plates about to be published by Messrs. Boydell.

The SUSSEX cattle are in very high estimation for beef and labour, and, in some degree, for milk; which latter respect they are superior to their kindred^d, the Devons and Herefords. Like the Herefords, they are a mixed breed, and much Welsh crossing is sufficiently obvious; but so great pains do not seem to have been taken in their improvement as with the Hereford. Enough, however, may be found in a state of original purity as to form. The Sussex are very flat and deep, generally red or brown in colour, and shew much blood; both wide and middle horned, the points turned upward and backwards, of various size, but the largest generally far too coarse in the bone, and of insufficient width or substance for their great depth of carcase. They yet need no alien cross, having all the materials of improvement within themselves, unless, indeed, to remedy the excessive flatness in some, a Hereford cross might be useful. Their speed appears to me remarkably great, and I doubt whether even the Devons are, in that respect, superior; they are, in the mean time, equal in powers to the cultivation of the heaviest clays, and to draught over the deepest roads; in temper somewhat quick like the Devons. Mr. Kingsnorth's bull, Old Noble,

and his two year old heifer, Pink, to be found in Scott's Sussex prize cattle plates for 1798, are the truest possible representation of Sussex cattle, in their best form. The above three noble breeds of cattle, probably not to be matched on the face of the earth for their peculiar excellencies, deserve the utmost care from our national improvers; and it is one of our first objects of national interest to spread them throughout the country as beasts of labour.

KENTISH HOMEBREDS. In Kent they rear a moderate number of heifers for the dairy, of a mixed breed, the Sussex generally forming the base, crossed with Welsh, long horns, Alderney, &c. A variety is thus raised of excellent butter-cows of a small size; and it is submitted to the breeders of Kent whether it may not be worth while to establish and render the breed permanent. In the Somerville cattle show of this year (1803) two bulls, said to be of this breed, were exhibited, of one of which, with the permission of Lord Somerville, I had the portrait taken for the National Cattle Plates. They were very remarkable for shortness of the leg, length of carcass, and vast substance; the bone somewhat coarse, and crooked in the hams. They were reported to be of a breed from Sussex bulls, introduced into Kent about forty years since.

Of the **WHITE CATTLE OF SURREY**, mentioned by old authors, I know nothing, nor do I believe Surrey was ever a breeding county. The notion may have arisen from some temporary introduction of Alderney, or other stock, of light colour. In fact, it is said, that some gentleman, about fifty years since, brought up from Lincolnshire, into Surrey, a lot of white cows, very large milkers, and that the same kind were at that time kept in Suffolk; they were probably of Dutch extraction.

The WELSH MOUNTAIN AND LOW-LAND CATTLE, or those of North and South Wales, and the Isle of Anglesea. There may have been originally two distinct breeds in Wales, the mountaineers having large wide horns, thick hides, and much bone, considering the smallness of their size; the cows producing little milk. The southern and low-land stock are of larger size and finer form, with middle horns, some good milkers; those of Glamorganshire of high repute for draught, on light or hilly lands. They bear some resemblance to the cattle of Normandy. The Welsh are generally deep and flat in form, some of them cloddy, and of great substance also. The Glamorgan, Pembroke, and Montgomeryshire, it is to be presumed, are the most valuable breeds of Wales. Yet the chief defect in the Welsh cattle, at present, is want of substance, and too great length of leg; to be remedied probably by a Hereford cross, where the object is beef or labour: but, it seems, much English crossing has been used at different periods, without effecting any very material change, the peculiar character of the country being sufficiently apparent in all Welsh stock. It may be worth while to be somewhat more particular with respect to the different breeds of Wales, so generally and decidedly a breeding province; and with Scotland, the other great resource for the graziers of England.

GLAMORGANSHIRE breeds plenty of neat cattle, sheep, and pigs. The cows rather small, of light bone, in colour black or brown, handsome, and shew much blood. They milk well, and feed quick. His majesty has honoured this breed with his royal approbation, as beasts of labour: they need no improvement from alien crosses, but there are inferior varieties of them, from being mixed with the stock of the borders. This breed, I suppose, prevails in Monmouth-

shire, and is to be found at the fairs and markets of Pontypool.

The PEMBROKESHIRE cattle, coal black, sometimes dark brown, finched, or with white towards the tail, some have white faces. They were originally finer than at present, probably the same race as the Glamorgans, which some of the Pembroke cows resemble at this time: but the breed has been crossed with the *old* Leicester, with the view of obtaining milk, in which the improvers did not succeed so well, as in rendering their stock coarse, bony, and unfit for labour. If butter was the object, they had better, probably, have retained the imported long horns unmixed. This cross accounts for the Pembrokes being finched, and having long and round carcasses. They generally labour on the roads, yoked with horses, and their journeys are performed with a speed unknown elsewhere. The Pembroke ox is too leggy, but he becomes early ripe, and will make fat at four years old. He attains the weight of 80 to 130 or 40 stone, London weight, and is said to stand his drift or journey better than any from Wales, whence he finds a preference, particularly in the counties adjoining the metropolis. Two year old Pembroke bulls are bought up at the fairs, at considerable prices, by the improvers of the neighbour counties.

CARMARTHENSHIRE. Their original breed black, coarse, ill-formed, short and thick, having wide horns of great substance at the base. The cattle, in course, small in the mountain districts, and of larger size in the vales, in good keep; but of no reputation as milkers. The improvers here have tried various crosses—Hereford, Shropshire, Leicester, Pembroke, Glamorgan, but they say without the desired success. The produce of a Pembroke heifer and Hereford bull, the fa-

yourite stock in this county, where, in truth, the prior object ought to be an improvement of keep.

BRECKNOCKSHIRE. The native breed much the same as the above, and those of Pembroke, but crossed with Hereford, and some with Devonshire bulls, labour seems to be the object, and with such crosses, and attention to good keep, a very excellent breed may be raised.

CARDIGANSHIRE. Smaller variety of the Pembroke and Carmarthen, hardy, and less milky than most breeds. Great numbers of cattle sent from hence to Kent and Essex.

RADNORSHIRE. In the extensive wastes of this county, cattle breeding the staple article. The breed dark red, and brinded, in consequence of the original black stock being crossed with the bulls of Hereford and Shropshire, adjoining counties. Although these crosses produce stock too large for the hills, they make excellent cattle in good keep, and of considerable size, namely, from 100 to 120 stone, London weight. It is remarked, that the produce of the Hereford cross has not the characteristic bald face.

MONTGOMERYSHIRE. The district for Welsh ponies, where they are almost innumerable. Half of this shire a level waste, provincially called mountain; chiefly depastured with sheep. Many good cattle are reared in the low-lands, improved by English crosses, which, it seems, have not in this county rendered the stock more tender than the native. Favourite colour, blood red, with smoky face. Dairy no object. Oxen from this county had been sold at Smithfield, as high as £30 a-head, previous to the late great advance of prices.

MERIONETHSHIRE. The native small and ill shaped breed, said to be worst in Wales; but Mr. Corbet,

the greatest general improver in the county, has crossed both the sheep and cattle with good English stock, to much advantage; as a proof, and a sufficient encouragement to such attempts, two cows of the same age, which had been reared and kept together, were of such different properties, that one was worth only five or six, the other twelve pounds.

CARNARVONSHIRE. The hardy natives have been formerly crossed and improved by English bulls and cows, some of them New Leicester and Warwick. The improvement succeeded in this county, and, with a small additional expense in rearing, the stock has been found sufficiently hardy, whether in the mountains or plains; and the improved cattle, at two and three years old, are worth more by two or three pounds each than the original breed. Heifers or queys sold at a year and half old. The drovers, it seems, were averse to the improvement, preferring the inferior breed and price. No dairying, or ox-labour; for although the farmers approve the latter, their masters, the ploughmen and carters, have an objection to it.

DENBIGHSHIRE, FLINTSHIRE, and North Wales, generally, are great breeding countries, the breeds crossed and mixed with those of England. Some good milch cows, in these parts, which will give six or seven gallons per day, three or four months after calving. The hills and commons so overstocked with cattle, horses, and asses, that many farmers decline the exercise of their common-right. This overstocking is of infinite prejudice to the country.

ANGLESEY. Vast numbers of cattle bred on this island, nine tenths of which are in grass. The small black breed, with wide and thick horns, prevails, and in far greater purity than in most parts of Wales. This hardy race is preferred on account of the con-

stant winter exposure, and defect of winter provision, and also because they are approved by the purchasers. A celebrated English cross was tried, without success; a necessary result, unless the keep were at the same time improved. The annual export of cattle from this small island was, some years since, estimated at ten thousand, from one to four years old, which swim over Bangor ferry. The remaining stock laid at forty thousand. Two drovers alone bought, in one year, 4786 head. The breeders decline keeping any cattle beyond the age of three years, not finding themselves reimbursed the charge of another year. Weight, when fat, at three or four years old, from sixty to one hundred and twenty stone, the fore quarters being the heaviest. No cross could possibly improve these islanders, unless bulls could be found of superior form, and equally hardy: such are, perhaps, to be sought for in the Isle of Sky.

In the quality of the Welsh cattle, generally, it may be said, there is no appearance of improvement of late years, notwithstanding the encouragement held out by prices, of which no former age can furnish a precedent. Indubitably the want of winter keep, and a good winter system, is the chief cause of this defect. In some parts of Wales they complain of want of sale for fat cattle, on account of distance of markets, the very circumstance which ought to confine them to store-feeding, as their proper system, and which will always be profitable in proportion to the good condition of their commodity. They have another complaint also, much more general, which I conceive can only subsist from want of due exertion; it is the heavy annual loss sustained by the insolvency of jobbers. On this subject a meeting has lately been held (Feb. 2, 1803,) at Pulbely, by the Gentlemen and Farmers of the districts of Plyn and Evionedd, Richard Ed-



wards, Esq. in the chair, and the following resolutions adopted :

“ That the best mode will be, to bring their cattle to public fairs, and not to sell them at their own homes prior to such fairs, as hitherto.

“ That advertisements of such resolve be inserted in all the provincial papers, in order to induce English drovers and graziers to attend the fairs to purchase cattle in the above districts,” &c.

As Welsh and Scots cattle are absolutely necessary, under the present grazing system of England, it appears to me no very difficult undertaking in the breeders, to make their concern, what it surely ought to be, a ready money one.

THE SHROPSHIRE WIDE HORNS. Large, square, deep, and bony, with thick hides, in colour brindled, red and brown, the horns branching, points turned upward and backward. They are used for labour, and said to be better milkers than their neighbours of Herefordshire, with which they are, doubtless, often blended. Of the origin of this variety no accounts are extant, or how long they have been a permanent or established breed. It has probably originated in a mixture of the old long horns, the Welsh and the red breed of the West.

THE LANCASHIRE, OR NORTH WESTERN, AND MIDLAND COUNTY LONG HORNS. This is an original species, probably of as high antiquity as any of this country, and is still to be found in considerable, if not entire, purity of form; because, although it has been used as a cross for almost all other breeds, the great improvers of long-horned cattle have generally, for various reasons, adhered to their own species. They were formerly called Lancashire long horns, that county, Westmoreland, and Cumberland, being the earliest and most considerable breeding districts; from

whence they spread southward, through the midland counties of Derby, Nottingham, Leicester, Stafford, Warwick, Northampton, Buckingham, all which are either breeding or dairy counties. The neck of land containing Lancashire and Cumberland on the western, and Yorkshire, Durham, and Northumberland on the eastern coast, has, by a curious singularity, been the parent country of both the long and short horned cattle; the latter extending from Northumberland, southward, to the county of Lincoln. Now as we know that, for ages past, it has been the practice to import short-horned cattle from the opposite continent to our eastern coast, it seems rational to suppose that the long horned, found on the western side, were also originally imported from the opposite coast of Ireland, the neat cattle of that country being all long horned.

The cylindrical, or barrel shape of the long-horned species, has been already described. Their characteristics are rotundity of carcase and bone, with considerable length of the former and coarseness of the latter; thickness of hide, and rich quality of milk, the quantity generally inferior to that of the short and middle horns. The horns of this species are either regularly and horizontally extended to the points, or fall adown the cheeks until their points meet, when the animal is sometimes styled *wheel-horned*. Occasionally, the long horns assume a fanciful direction upwards, bending irregularly at the extremities; sometimes one horn takes its course up, the other downwards. The original colours of the Lancashire cattle were red, pied, brinded, and finch backed, that is, having a list of white along the back; the last is the strongest characteristic of long-horned blood, as the bald face is that of Hereford; and the smoky face of Pembroke. The species, with a few

exceptions, is generally too slow and sluggish for labour; which circumstance, joined to certain absurd propositions of the ancients already noted, has led many to form very erroneous conclusions on the subject of ox labour.

From the peculiar rotundity of form, and in long-horned cattle, the richness of their milk may be augured a propensity to fatten, and Mr. Bakewell's system and practice have fully proved their superiority in that respect. They are probably also the smallest consumers of food in proportion, and their hides, on account of their substance, are of great value. As dairy stock, their superior character has been established, through a long course of years, and the breed, in consequence, has been dispersed in every part of the island. Within these few years, however, the short-horned species have found admittance into many large dairies, it may be presumed on account of the excessive price of beef and pork, and on the supposition that larger milkers and larger cows, if they make less butter, will balance the account profitably, by the production of a greater quantity of the former articles.

It was on this breed of neat cattle that the celebrated Mr. Bakewell exercised his great talents at improvement. Many years before, Sir Thomas Glasby had selected from Lancashire and Westmoreland a herd of the best shaped cows. Certain descendants of these were afterwards purchased on the banks of the Trent, and introduced into Warwickshire, by Mr. Webster, of Canley, in that county, whence originated the celebrated Canley breed. The breed of the county were already long horned, but far inferior to those introduced by Mr. Webster. Bakewell commenced his operations with Canley cows, and a bull from Westmoreland, called Twopenny. After

breeding in and in, with this stock, through a great number of descents, ever selecting individuals of the roundest form, and smallest bone, he attained the desired success in those respects, and raised that variety which has been since so celebrated for aptitude to acquire external fat. But in the attainment of this end he sacrificed the quality of great milking, and rendered the animals less certain in the faculty of procreation. Hence the Dishley or New Leicester variety of long horns are calculated solely for the purpose of the grazier, the old breed retaining its superiority in the dairy.

There seems to be no opinion formed of any specific difference of quality between the flesh of these and the short-horned cattle; but if we are to judge by analogy of the hides and milk, we may reasonably attribute a more nutritious and substantial quality to the flesh of the former. It is usual to deem any presumed specific difference in the quality of the flesh of those animals on which we feed, as a groundless refinement, and to attribute every effect to the victuals on which they are fattened. Such idea, however, seems to be but another refinement. No keep will equalize the milk and hides, probably not the flesh, of distinct breeds; but we possess an unerring standard to determine of the former, whilst taste alone determines concerning the latter.

The size of the improved long-horned stock of the midland counties is considerable, as appears by a four year old steer of Mr. Prinsep's breed, killed some years since, the weight of which was 248 stone, 14 pounds to the stone, exclusive of twenty-five stone of fat. The hide weighed 177lb. It must be remembered, also, there is a mellowness and ductility in the thick hides of well-bred stock, which much enhances their value at the leather market.

The reality of the Bakewellian improvement of neat cattle for the grazier's purpose, ought to be indubitable, from the vast prices given in the midland grazing districts, unprecedented in any other; this even after making considerable allowance for suspected jockeyship. Mr. Bakewell probably set the example of letting bulls and rams. His bull, Twopenny, before mentioned, covered at five guineas each cow, and he had many cows worth thirty guineas each. After a course of some years improvement, all his bulls were engaged for the season, from five to thirty guineas each, according to their form.

Mr. Fowler, of Rolwright, in Oxfordshire, was the earliest and most successful disciple of Bakewell. He commenced his breeding career with two Canley cows, for which he engaged the bull Twopenny: the produce, two cows, which he named Long-horned Beauty and Old Nell. He had also, in 1778, a bull of Mr. Bakewell, called D, which was the sire of Shakspeare. Thenceforth he bred entirely from his own stock, with what degree of success, will be seen in the prices obtained by auction at his well-known sale in 1791. These have appeared in various publications, but will take up little room here, and may be yet matter of curiosity, or the cause of emulation in some readers.

PRICES OF THE BULLS.

	£.
Garrick, five years old	250
Sultan, two years old	230
Washington, ditto	215
A, by Garrick, one year old	157
Young Sultan, ditto	210
E, by Garrick, ditto	152

PRICES OF THE COWS.

	£.	s.	d.
Brinded Beauty by Shakspeare	273	0	0
Sister to Garrick	120	0	0
Nell by ditto	136	0	0
Young Nell by Brother of ditto	126	0	0
Black Heifer	141	0	0
Dam of Washington	194	0	0
Fifty-three head of cattle produced	4289	4	6

Other improvers have had an ample share of fame and success. Mr. Princep, of Croxhall, engaged Shakspeare two seasons at one hundred and sixty guineas. In 1795, at Mr. Padget's sale, Shakspeare sold for 400 guineas, the cow-stock making from 50 to 80 guineas each.

In a comparison between long and short-horned cattle, Mr. Culley makes the following remarks, which are, I think, generally well grounded—‘ the long-horns excel in the thickness and firm texture of the hide, in the length and closeness of the hair, in their beef being finer grained and more mixed and marbled than that of the short-horns, in weighing more in proportion to their size, and in giving richer milk; but they are inferior to the short-horns in giving a less quantity of milk, in weighing less upon the whole, in affording less tallow when killed, in being generally slower feeders, and in being coarser made and more leathery or bullish in the under side of the neck. In few words, the long-horns excel in the hide, hair, and quality of the beef; the short-horns in the quantity of beef, tallow, and milk.’

The NORTHERN SHORT HORNS, including the TEES-

WATER, LINCOLN, and HOLDERNESS, or YORKSHIRE and TWEED-SIDE SHORT-HORNS. It has been observed, that the northern short-horned species is the largest breed in Britain, the Herefords standing in the second place in that respect. The short-horns are an original species, but whether those of our northern counties are so or not, cannot now be ascertained; that is to say, whether they are aboriginal, or were imported in very early times, as we know they have continually been during several centuries. This breed has long been in possession of the coast and districts of Northumberland, Durham, York, and Lincoln, meeting and intermixing with the Lancashire long-horns westward, but not extending so far towards the south. Opposite in almost every respect to the long-horns, this species has great depth of carcass; yet with ample substance, large bone, thin hide, and gives much milk, which is not distinguished for its richness. They are not of first rate character as labouring cattle, which nevertheless the Holderness variety seems to promise by their form. We look to the coarse, square, Dutch beefy breed, as the basis of this species. In many parts of the north they remain still coarse, and by no means equally disposed to large milking. The common Lincolnshire cattle are coarse in head and horn, large boned, high upon the leg, and to borrow a jockey phrase, ragged hipped. Equally coarse internally, but producing flesh in great quantity. The Lincoln neat cattle, in fact, plainly demand a *Bakewellian* improvement, such as their sheep have received. The idea is strongly impressed upon my mind, from looking over, at this instant, a lot of Lincoln wedders, the most boney, coarse and leggy, of the old breed. The analogy between these, and the bullocks, was most striking. Of the Teeswater breed (which is probably a mere temporary inter-

mixture, no such settled variety existing) some very beautiful individuals have appeared at different times from Holderness crosses. The most accurately marked and distinguishable permanent varieties of the northern short-horns appear to me to be the Holderness and Lincolnshire. Culley tells us, that amongst the old stock there were some with black flesh which would grow, but never fatten, provincially called *lyery*; these were to be known by the rotundity of their shape, approaching, in many respects, that of an ill formed cart horse.

The extreme coarseness and size of the northern short-horns led to the introduction of Norman or Alderney bulls, at some period of the eighteenth century, with the precise date of which we are unacquainted. This improvement commenced in Holderness, Yorkshire. Never was there a more fortunate cross. In no other country does exist so excellent a breed of cattle, as those of Holderness, including all the useful properties. In one, perhaps the most important respect, great milking, they are superior, and even without rivals. Their beef is finer than that of the old short-horned breed, and they fatten much earlier and quicker, carrying still a vast depth of natural flesh, and tallowing within, in the first degree. They have both speed and strength enough for labour, and their shoulders are well formed and well posited for draught. Being beautifully variegated in colour, spotted, striped, sometimes *sheeted* red and white, or black or brown and white, they make fine park stock, a noble example of which may be seen at the seat of the Earl of Coventry, in Worcestershire. From their superior quantity of milk, they rival the best long-horns in the cheese and butter dairies, and for suckling, are unrivalled. It may be presumed, they are at least equal to the Herefords,

in the stall, at all points; and there seems but one respect, in which they are, in any considerable degree, inferior to any breed which can be named, which is fineness of flesh; in that particular, it is obvious, they can never equal certain other breeds, without the entire overthrow of their Dutch basis, by a repetition of the Norman, or some similar cross, which would go to destroy the present superior breed. An occasional mixture, however, of Norman blood may keep the Holderness stock sufficiently fine, and prevent its degeneration on the other side: or a selection might be made of very elegantly shaped and fine boned Holderness cows, with the view of improvement. These are well known, as the stock generally kept by the London cow-keepers. They have small short horns, in the shape of a half ring, rather a long plain head, fine skin, the legs seldom too long, the carcass large, but compact, good back and loin, the general figure square. They are not the species of stock for short keep, however small their size; indeed they are said to be great consumers. A party of us have an adage in use—"the less cattle eat, the more they pay." To which I beg to tack the following counterpart—*it matters not how much cattle eat, provided they pay for it.*

This high character of the Holderness cattle, I desire should be received with considerable reserve. It relates to the cows chiefly, and to a selection of the oxen; to what they ought, and might be, rather than what they generally are. I am in the constant habit of viewing great droves of Holderness, and other northern short-horned bullocks, and I am sorry to say, they are too often the worst shaped cattle in England, and perhaps the least profitable. Long, gaunt, deep carcasses, without adequate substance, placed upon high stilts of the coarsest timber. Slow

feeders, never fat, and the flesh excessively coarse. The feeding such ill shaped stock must be immensely disadvantageous, and is particularly disgraceful, in districts which produce the best models. The first object is to shorten the legs of these true Pharaoh's kine, which surely might be effected by a conjunction of the best Teeswater and Holderness bulls, with selected short legged cows. It is a striking fact, obviously indicative of a rapidly increasing population, that notwithstanding unprecedented prices, encouragement and improvements, store cattle are at this instant, so scarce, that many graziers must come short of their needful quantity. I have been assured by a friend, on whose intelligence I can rely, that an eminent cow-keeper, in London, purchased last month (April 1803) fifty Holderness cows at the enormous price of £.1,200. Only one of these had a calf by her side, with which my friend was accommodated at the price of £.27. 10s. Such cows, before the war, were to be purchased, in lots, at something less than twelve pounds a head.

Mr. Culley's description of a short-horned bull has been already given, page 21; that excellent practical writer has also given us the weight of several short-horned, or Teeswater beasts. The following was five years old only, killed at Bernard Castle in 1789, and equal in point of size, probably, to any of that age, which the country has produced. The weight as below, 14 lb. to the stone.

	Stone.	lbs.	s.		£.	s.	d.
Two fore-quarters..	74	8½	at 4	per stone	14	18	5
— hind ditto.....	75	10	... 5	18	18	7
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Weight of carcase..	150	4½			£.33	17	0
— tallow...	16	0	at 4	3	4	0
— hide.....	10	11	... 4	2	3	0
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Total.....	177	1½	Value.....		£.39	4	0
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A cow of the same breed weighed 150 stone 3lbs. carrying nearly 16 stone of tallow. A six years old spayed heifer 132 stone 6lb., the carcase only. It may be observed, that the best and quickest feeders of this breed are not remarkable for milking. The **TWEED-SIDE** short horns are a valuable variety of the Teeswater.

THE NORTHERN HALF LONG HORNS. These are the immediate produce of a conjunction of the long and short horns, which must, of necessity, frequently happen upon, and in the vicinity of those mountains, which separate the native district of the two species, to wit, Lancashire and Yorkshire. The horns of this variety, I think, generally run out pretty strait and even, unlike those which are called middle, or wide horns. The half long horns are a large and long breed of cattle, partaking equally, as may be supposed, of the qualities of each species, and thence ought to be good dairy cattle, as uniting quality and quantity of milk, and size; in fact, I have been assured by an intelligent Essex dairy-man, that they have the best title to such character, and many years since, when cow-stock was at a low rate, he preferred going to the price of sixteen or seventeen guineas a piece, for this description. They are not so permanently established and generally known as their originals.

THE NORTHERN OR YORKSHIRE POLLED CATTLE. These have the same qualities as the short-horned cattle, carrying vast substance, and some I have seen lately are of great size, although in that particular, they are most conveniently various. In my opinion they are a most excellent breed, and well merit improvement, with the view of labour, by a selection of the finest boned and most active individuals. From the shape of these polled cattle, they hold a strict affinity in all respects with the short-horned, amongst which

they are found; and it seems that various breeds of horned cattle are attended with hornless, but perfectly congenial varieties. The above, for example, and the polled galloways of Scotland, of similar shape and quality with the long horns, also the Devon natts, or polled cattle on the coast.

NORFOLK HOMEBREDS, so styled since that county, from its great improvement in cultivation, has ceased to be much of a breeding one, having found it generally more advantageous to purchase. These homebreds, nevertheless, are found to graze earlier and quicker than either the Scots or Welsh, so much in use in Norfolk; and no cattle are said to make better proof, or to bear a higher character with the Smithfield salesmen, than Norfolk homebreds. They do not, as yet, form any permanent variety, but consist of Suffolks, Lincolns, Scots, Welch, or a medley of all these. Essex, Suffolk, Cambridgeshire, Rutland, also have their homebreds, or random crossed breeds, all great favourites with the salesmen and butchers.

SUFFOLK DUNS. This variety, most probably, originated in the polled Galloway breed of Scotland, with which Suffolk and Norfolk have been supplied, during more than a century past. They are of lighter colours, smaller, and finer in bone than the Scots Galloways. Long, with a large carcase, clean throat, snake headed, that is, the neck tapering to the head, thin tail, and rather short legs. These are very excellent dairy stock, giving the largest quantity of milk, in proportion to their size, of any breed whatever, but not rich in proportion with the long horns or Alderneys. A first-rate Suffolk cow will give six gallons of milk per day, when in full milking, and at the best season. This breed also feeds well, and the beef is fine: it is one of those breeds of such inherent excellence, as not to be improvable by any known cross. The

Suffolk cow is one of the most advantageous for a private family.

The SCOTTISH ISLAND, MOUNTAIN AND LOWLAND CATTLE. It is not improbable, that there were only two original species of neat cattle in Scotland, those common to the islands and the mountain country, called kyloes, in colour black, brinded, dun, brown, red; black being the favourite colour in Scotland: in form, flat and deep, like the short and middle horned stock; very small and hardy, with small, upright, short or middle length horns: and the polled breed, chiefly confined, in latter times, to the shire of Galloway, and known by that name. The former, the smallest, and most hardy breed, known in this island, and apparently the same with that of the more northern countries, may be seen, at this day, in its original purity, no motive existing for crossing a breed so perfectly adapted to severity of climate and scarcity of keep. The original polled cattle were of the same colours, but more varied, and considerably larger in size; in shape somewhat long, and resembling the long-horned species, with hides of considerable thickness: when these cattle are entirely hornless, they may be presumed of the genuine breed. In the lowlands, where the soil is abundant in provision, and where, in consequence, larger sized cattle are supposed most advantageous, much crossing, under the name of improvement, has taken place. Thus the Scots polled cattle have been perpetually crossed with English bulls, both short and long-horned, with Norman, and with their own mountain stock. Whence the varieties of Galloway, Ayrshire, Fifeshire, and of the runts, which we, at this day, find in Scotland. The Duke of Argyle ranks first, as the great herdmaster of the north, and the West Highland cattle

of his Grace give the fashion, and meet a preference at all markets.

It is probable, I have seen specimens of all the established breeds, both of Scotland and Wales, but having never visited Scotland, I make free to borrow the following extracts from Mr. Cully, respecting the Scotch cattle. “ These hardy animals (kyloes) are in possession of all that extensive and mountainous country, called the Highlands of Scotland, together with the western isles, bounded on all sides, by the sea, and the Grampian hills, the latter of which begin on the north-side of the Frith of Clyde, and run eastward into the sea near Aberdeen.

“ All the lowlands of Scotland, except Galloway, have a mixed breed of cattle; towards Cumberland, they are half long horns, half polls; on the borders of Northumberland, they are mixed with short horns, until you reach near Tiviotdale, where they become altogether a coarse kind of short horns, or what the Yorkshire jobbers call runts; except a few pretty good short-horned cattle bred in that pleasant fine country the Tweedside. This same kind of runtish coarse breed continues all the way to the Frith of Forth. Crossing this narrow sea into Fifeshire, you would at first imagine the Fife cattle a distinct breed, from their upright white horns, being exceedingly light ligered and thin thighed: but I am pretty clear it is only from their being more nearly allied to the kyloes, and consequently less of the coarse kind of short horns in them. I have lately been told, that the Fifeshire cattle are in very great repute in the south of England, as good graziers, and bid fair to rival the Galloway cattle in Smithfield-market. May not this be owing to the Galloway cattle being injured by crossing with a coarse kind of long horns, bred on

the English borders; and probably the Fifeshire breeders of late paying more attention.

“The cattle, all along this coast, continue to change more and more, growing still less, until upon the edges of the mountains, they become quite of the kyloe kind; but still much inferior to that pure, unmixed, valuable breed of kyloes, which we meet with in the more northern and western highlands, and all the islands, particularly the Isle of Skye, and that tract of country called Kintail. It is in these two districts, that you meet with the native breed of kyloes; a hardy, industrious, and excellent breed of cattle, calculated in every respect, to thrive in a cold, exposed, mountainous country, and better adapted to the cold regions, where they are bred, than any other kind we are acquainted with.

“These cattle are driven to the southward in great numbers every autumn; many into the western districts of Yorkshire; but the greatest part are sent into Norfolk, Suffolk, Essex, and other parts of the south of England, where they are fatted, and either slaughtered at their home markets, or sent to Smithfield.

“The demand for kyloes into England is of vast importance to those nobility and gentry, who have estates in the north of Scotland; as the most of their rents are paid in live cattle.

“Admiral Sir John Lockhart Ross, and some other spirited gentlemen, have tried some crosses, &c. between long-horned bulls and the Isle of Skye cows. Whether this will answer the end or not time will shew; but whatever the result may be, there is certainly great merit in the attempt.”

To enter into a few additional particulars respecting the Scottish cattle, we will begin with the famous

kyloes, or dwarf bullocks, according to national partiality, "worth more in beef, by a penny per lb. than any other breed upon the island." This may be frequently true, on the simple account of smallness of size; however, the beef, to evince its superior excellence, need but be seen and tasted. But my experience of this famous breed will not warrant me, in carrying the superiority forward to quantity also, since I have been often convinced that the kyloes will not equal our larger breeds in quantity of beef per acre, whence, if kyloe beef must be allowed the best, it must also be acknowledged the most expensive meat. We may go farther, and challenge for high quality, with our Devon beef against the smallest from the Highlands, or isles of Scotland. Some connoisseurs, on the other hand, assert, that both the Devon and kyloe beef is frequently hard and dry, and that for substance, mellowness of flesh, and richness of the juices, our Hereford and midland county cattle are, in reality, superior. It is probable, that the flesh of all hill cattle, and that which is fine-grained, becomes dry and hard, almost immediately after the middle age; and I agree with Mr. Middleton, that labour has the effect of rendering the sinews tough.

The Highland cattle, in their natural, unimproved state, are frequently well formed. Their fine eyes, acute face, and lively countenance, give them an air of briskness, or rather fierceness, heightened by white, tapering, black-tipped, and sharp horns, pointing upwards, forwards or backwards, which are really dangerous. Their most common weight in Smithfield is from thirty-five to forty-five stone, but they may be made much heavier. The weight of a kyloe, given by Mr. Culley, is so considerable, that I conclude, it was the result of a cross by some larger breed. It was bred, he says, in Cantire, and fed by Mr. Speer-

man, of Rothely Park, Northumberland, and killed in July 1790, weight as under.

	Stone.	lb.
Two fore-quarters	43	12
— hind ditto . .	37	$8\frac{1}{2}$
	<hr/>	
	81	$6\frac{1}{2}$
Tallow	13	0
Hide	6	4
	<hr/>	

Total . . 100 $10\frac{1}{2}$, or upwards of 176
stone, Lond. weight.

The Isle of Sky bulls are of the highest repute, and some years since, the improvers of Argyleshire would go to the price of twenty, or thirty guineas, for a well bred bull, the chief characteristics being, fine eyes and horns, and a thick pile. This breed (another exception) although by no means long-horned, nor remarkably thick hided, exceed in the quality, rather than the quantity of milk; and in that view, must be crossed with Norman, or some other milky breed. A Fife cross increases the milk. I lately saw a thorough bred kyloe cow at the house of James Ward, the celebrated cattle painter, which gave about a gallon of milk per day, on hay, consuming about a truss in three days.

The best Highland cattle, it is said, are bred in *Lochaber*, *Sunart*, *Morvin*, *N. Argyleshire*, and *Cowall*, or *Rannock*, in the central Highlands. They are sound and hardy stock, little liable to diseases of any kind. They are suffered to suck their dams in rearing; but under the usual stupid pretence of hardiness, these excellent cattle, young and old, are exposed to all the horrors of winter in their inhospitable

climate. And as if common sense was not the growth of the soil, in those parts, where, by custom, the breeders house their cattle at night, in their own hovels heated by smoke and animal effluvia, they are turned out in the morning reeking, to wander, without shelter or food, in rain, snow, sleet, or storm. It need not excite surprise, that an average of one fifth are lost by mortality, or that the same breed of cattle are of superior worth in better situations, and under more favourable treatment. Ten or a dozen years since, the expence of rearing a Highland bullock to four years old, allowing seven shillings for risk, was calculated at £ 2. 3s. 8d. the market worth of which was only from £.2. 2s. to £.3. No wonder that the farmers at length became weary of such a system, and eager to make trial of sheep in substitution; with which, by the bye, it is easy to make similar errors in management.

The ORKNEY Isles are said to produce a small, ill-shaped breed of cattle, which are both good milkers and excellent beef. The cattle of BAME are amongst the largest and best of the north.

The FIFESHIRE stock are of considerable size; black, lively, up-horned, and of good repute in the south: they feed quick, and are fit for labour. For the dairy, their cows have the character of giving rich milk, rather than any great abundance; their produce in butter about seven pounds per week, and they are steady in the continuance of their milk. Upper Fife cows, and a Highland bull, supposed very eligible for a northern dairy: one would judge an Orkney bull preferable, from the reputed milkiness of that breed.

The famous GALLOWAY breed is found in various parts of Scotland, beside the shire of that name, but they exist perhaps no where in original purity, except in the moors of *Monigaff* and *Glenlove*, and these

cattle are generally thinner in the hinder quarters, than such as have been crossed by other breeds. They prevail also in Dumfries, particularly on the Nithsdale side. It is remarked, that although this breed is the most celebrated and favoured in Scotland, where every breeder will boast his *true* Galloways, yet these have been perpetually crossed, as it should seem, to render them still more true. The original colour black, a few brinded, all perfectly hornless. Amongst the common run of Galloway cattle, we sometimes find them white faced and pyed, with small grizly horns, undoubtedly from a mixture with Dutch or English short-horned bulls; but this cross is said to detract twenty per cent. from the worth of a beast. As to form, they are broad and square in the shoulders, long and round bodied, yet deep, straight and broad on the back, with a thick, shaggy coat, the legs of middling length, with large feet. The *pelvis*, or hinder part beneath the tail, and between the two bones, is frequently too narrow, in Galloway cows, whence they want assistance, and sometimes fail in calving. Their character is good as milkers, chiefly for quality. The oxen and spayed heifers make middle sized beef, of an excellent quality, and the breed is with justice esteemed one of the best in Britain. All the calves of this breed, I believe, are reared in Scotland, and more of the females spayed, than of any other breed; the operation is performed in May upon yearlings. The Galloway cattle are sold at two years and a half old, and probably, the English graziers take off annually, near thirty thousand head. There is considerable care and diligence used in Galloway, in their business of rearing cattle, more especially in the provision of hay for winter use; but they want good home-stalls, and ample cattle-sheds, for the protection of their stock in that moist climate; and in

addition to their hay, they would find great benefit in the use of rutabaga, or common turnips, and cabbage.

In RENFREW AND AYRSHIRE, are said to be the best milch cows, considering their size, which are to be found in Britain; and that both in point of quantity and quality of milk, producing from three and a half, to seven gallons per day. They are usually called DUNLOP, and have the character of being the best possible "poor man's cows," from their ability to shift on very scanty keep. In appearance, they are small, and ill-looking, with the shape and pile of Highlanders, yet bearing more resemblance to the Dutch, than to any native Scots breed. Their horns are short and small, standing remarkably irregular and aukward; colour generally pied, or of a sandy red. They appear unthrifty and thin, like the Alderney, even in the best pasture, and the few which are bred up to oxen make but a poor figure in grazing, scarcely reaching the common weight of kyloes. I apprehend this milky race to be the result of crossing the cows of the country with Alderney bulls, the cows, perhaps, having previously a portion of Dutch blood. The red cattle of Devonshire were some years since introduced into the shire of Ayr.

Many of the Dutch and Holstein breed have been kept immemorially in the southern parts of Scotland, and a large drove of the former lately passed through London, on their way to North Britain. The BERWICKSHIRE cattle have been improved by Teeswater bulls from Northumberland. They will make, at three years old, sixty to nearly fourscore stones of fourteen pounds, and at five and six, from eighty to one hundred and twenty stones. Their best cows will milk as high as six gallons per day. The Berwickshire ox is thus described. "Long face, open countenance, clean and small, turned up curving and

spreading horns, straight shanks, straight and round along the back, full and deep in the ribs, short legs, thighs turned out, open boned." The ox said to be bred in Berwickshire, and shewn in Pall-mall, London, in the spring 1803, appears to me to be a true Northumbrian. He is probably the largest ever exhibited, and in all the essentials of form unexceptionable. Vast length, depth, and substance. Vast and capacious loins, but heaviest in the shoulders, which are of remarkable height. Long and full thigh and forearm, yet not overloaded. The shortest possible legs and neck, and the bone fine. The head long, plain, and set on abruptly. The countenance placid. Colour a rich, deep red, with a few white spots on the face, clean chops, small dewlap, small tail reaching the hocks.

The case may be altered, since the introduction, or greater extension of the sheep husbandry, in the north of Scotland, but previously, beyond a doubt, the breeders of black cattle indulged themselves in the increase of numbers beyond their powers of provision, the natural consequence of which was a great mortality, during every winter season, and a general deterioration of quality in the stock. As we try every thing in South Britain, it has often surprised me, that no English improver has ever bred Scotch or Welsh cattle, although we are perpetually dabbling and crossing with them. Similar ideas, I find, have also occurred to Mr. Culley, who is inclined to think that the Galloway and Kyles cattle might be bred with advantage, in many situations, so as to be more profitable, than either the short horns or the long. Yet there is no doubt, that from a scarcity of store-stock in the south, from the force of long-established usage, and from the temptation of inferior price, much rubbish, both from Wales and Scotland, is annually

purchased by our graziers; and I am constantly in the habit of seeing such upon marshes, and other feeding grounds, which would carry nearly equal numbers of the second in size of our best cattle, and these probably be little or nothing behind the former in point of time. One powerful argument, however, in favour of the Welch and Scotch cattle ought not, in justice, to be overlooked: we find them used, in great numbers, in our most eminent breeding and grazing districts. At the trist, or fair of Falkirk, in Scotland, upwards of fifty thousand head of neat cattle have been exposed to sale in one week.

THE WILD CATTLE OF ENGLAND. This breed is at present to be met with but in a few gentlemen's parks: particularly at Chillingham Castle, Northumberland, a seat of the Earl of Tankerville, and at the seat of a nobleman, in one of the midland counties. At Lord Tankerville's they seem to remain in their original wild state. As I have never seen these, I quote Mr. Bailey, an eye witness.

"The wild breed being untameable, can only be kept within walls or good fences; consequently very few of them are now to be met with, except in the parks of some gentlemen, who keep them for ornament and as a curiosity; those I have seen are at Chillingham Castle. Their colour is invariably of a creamy white; muzzle black; the whole of the inside of the ear, and about one third of the outside, from the tips downward, red; horns white, with black tips, very fine, and bent upward; some of the bulls have a thin, upright mane, about an inch and a half, or two inches long. The weight of the oxen is from 35 to 45 stone, and the cows from 25 to 35 stone, the four quarters, 14lb. to the stone. The beef is finely marbled, and of excellent flavour.

"From the nature of their pasture, and the frequent

agitation they are put into by the curiosity of strangers, it is scarce to be expected they should get very fat; yet the six year old oxen are generally very good beef, from whence it may be fairly supposed, that in proper situations they would feed well.

“ At the first appearance of any person they set off in full gallop, and, at the distance of about two hundred yards, make a wheel round and come boldly up again, tossing their heads in a menacing manner; on a sudden they make a full stop at the distance of forty or fifty yards, looking wildly at the object of their surprise; but upon the least motion being made, they all again turn round, and fly off with equal speed, but not to the same distance, forming a shorter circle, and again returning with a bolder and more threatening aspect than before; they approach much nearer, probably within thirty yards, when they again make another stand, and again fly off: this they do several times, shortening their distance, and advancing nearer and nearer, till they come within such a short distance, that people think it most prudent to leave them, not choosing to provoke them further.

“ The mode of killing them was perhaps the only modern remains of the grandeur of ancient hunting. On notice being given, that a wild bull would be killed on a certain day, the inhabitants of the neighbourhood came mounted, and armed with guns, &c. sometimes to the amount of an hundred horse, and four or five hundred foot, who stood upon walls, or got into trees, while the horsemen rode off the bull from the rest of the herd until he stood at bay, when a marksman dismounted and shot. At some of these huntings twenty or thirty shots have been fired before he was subdued. On such occasions the bleeding victim grew desperately furious, from the smarting of his wounds, and the shouts of savage joy that were echo-

ing from every side. But from the number of accidents that happened, this dangerous mode has been little practised of late years, the park-keeper alone generally shooting them with a rifle gun at one shot.

“ When the cows calve, they hide their calves for a week or ten days, in some sequestered situation, and go and suckle them two or three times a day. If any person come near the calves, they clap their heads close to the ground, and lie like a hare in form, to hide themselves; this is a proof of their native wildness, and is corroborated by the following circumstance that happened to the writer of this narrative (Mr. Bailey of Chillingham) who found an hidden calf two days old, very lean and very weak: on stroking its head it got up, pawed two or three times like an old bull, bellowed very loud, stepped back a few steps, and bolted at his legs with all its force; it then began to paw again, bellowed, stepped back, and bolted as before; but knowing its intention, and stepping aside, it missed him, fell, and was so very weak, that it could not rise, though it made several efforts; but it had done enough, the whole herd were alarmed, and, coming to its rescue, obliged him to retire; for the dams will allow no person to touch their calves, without attacking them with impetuous ferocity.

“ When a calf is intended to be castrated, the park-keeper marks the place where it is hid, and, when the herd are at a distance, takes an assistant with him on horseback; they tie an handkerchief round the calf's mouth to prevent its bellowing, and then perform the operation in the usual way, with as much expedition as possible. When any one happens to be wounded, or is grown weak or feeble through age or sickness, the rest of the herd set upon it and gore it to death.”

The above is fancied by some, to have been the original breed of this island, which may be true in

the restricted sense, that there was, *ab origine*, such a variety; and if I recollect aright, such colours and marks of cattle in this country are mentioned by ancient writers. The breed hath been thus far preserved, from motives of curiosity, which distinction it deserves equally from those of real use, since the size is good and the beef excellent. Chillingham bulls would form a most eligible cross for large and coarse breeds, and would impart beautiful and pleasing colours.

The ALDERNEY AND NORMAN CATTLE. The cattle of the islands on the French coast are, I believe, collectively known by the name of Alderney. These are a variety of, and smaller than the Norman; light red, yellow, dun and fawn-coloured; short, wild-horned, deer necked, with a general resemblance to that animal; thin, hard and small boned; irregularly, often very awkwardly shaped. This description refers chiefly to the cows. They are amongst the best milkers in the world, as to quality, and in that respect, are either before or immediately next to the long horns; but weight of butter for inches, they are far superior to all. I have been assured by a respectable friend, that an Alderney strayed cow, during the three weeks she was kept by the finder, made nineteen pounds of butter each week, and the fact was held so extraordinary, as to be thought worth a memorandum in the parish books. The Norman and island cattle make fat very quick, and for their bulk, arrive at considerable weight. The beef is of the first class, very fine grained, in colour yellow, or of that high colour, with a bluish cast, and elastic feel, which denotes the closest grained, most savoury and finest meat. I recollect some years since, a heifer, bred between Alderney and Kentish home-bred stock, and fattened on cabbages and carrots, which made one hundred and fifty stone, dying uncommonly fat. This species is, in

course, a proper cross for the large and coarse boned ; but in that view, I should prefer the real Normans from the continent, as generally better shaped than the islanders. Many persons near the metropolis, and along the south and western coast, make a trade of importing this cattle, which are extremely convenient for private families, and make a good figure in parks and lawns. As under, is the weight of his grace the Duke of Bedford's French ox, exhibited at the Smithfield cattle shew, Dec. 1802.

	Stone.	lb.		lb.
Weight of the carcase...	96	3,	Lond. wt. 8 to the stone.	
— of the fat.....	17	3		

This small beast, when alive, did not appear to me to weigh nearly so much, but he was very ripe, and had considerable length.

The IRISH are originally long horned cattle, smaller than those of England, somewhat coarser, and higher on the leg ; their produce in hide and tallow, considerable. The mountain cattle in Ireland are smaller and coarser than those of the low country, giving a very small quantity of milk. The breed, however, has been improving for some years, from English long horned stock, and indeed, at this time, the improvement of all the domestic animals is carried on, much to the honour of the gentlemen and cultivators of that fertile country, with a spirit unknown even in England. Probably, no country in the world produces so many cattle in proportion as Ireland, and it has also, in former ages, been renowned for its fine woolled sheep. Mr. Culley saw at one fair at Ballinasloe, in Roscommon, thirty-five thousand head of cattle shewn, and half of them fat, all which were bought up for slaughter at Cork.

On the subject of improvement in Ireland, I am en-

abled to speak from high and unquestionable authority. The following quotation is from a tract of Lord Somerville, just published (being his lordship's second work on rural and economical subjects) intituled, "Facts and Observations relative to Sheep, Wool, Ploughs, and Oxen:" a book which every farmer ought to peruse with attention, and in which, many will find various sources of profit pointed out, unknown to them before. "Whatever our exertions may be, to improve our soil, and to promote the national husbandry to the utmost, they will be far outdone by that unexampled spirit which pervades every rank of landed proprietors of Ireland: there are not less than ten thousand members, and thirty societies, in different parts of the kingdom, all connected with, and assisted by the friends of the great farming society of Ireland, from whence premiums are offered annually to the amount of twelve hundred pounds, for the improvement of stock and implements, and for other purposes of active and immediate utility: the value of land, and its daily rise, will best bespeak the sense that country has of these operations. Had such an advance in the price of land taken effect some years since, people might have argued that it arose from an increase of capital vested in trade circulating itself, as the capitals of Glasgow have done over the western counties of Scotland, producing a like improvement; but no increase of trade can have had time to operate on the landed interest of Ireland, and the advance in value of its land has depended on itself alone.

"Similar provincial societies, in like manner connected with one central establishment, under the sanction of government, we proposed some years ago. Obvious as their advantages must have been, many wise heads decided, that the measure was fraught with danger to the state: to convene twenty or thirty per-

sons in different districts of the country, twice or thrice a year, unarmed, to discuss and decide on subjects of notorious utility, was deemed perilous; when the very same men, who must of necessity, together with a few of our gentry and clergy, compose these meetings, are embodied as volunteers, are intrusted with arms, and after a probation of eight years, have been hailed with one voice, the support and ornament of our constitution: whilst in Ireland, where the sword of rebellion is scarcely sheathed, such an establishment, instituted by its most distinguished statesmen, and supported by the most loyal subjects it possesses, is daily proving itself a blessing to that country, inasmuch as it must and does promote industry, which is the parent of peace." P. 134.

ON BREEDING AND REARING NEAT CATTLE.

THESE animals, as has already been observed, are fit for procreation, in, or indeed before their second year; but they who aim at breeding good stock, whatever they may do with their cows, should, at least, not make use of a bull until three years old. Neat cattle live to the age of twenty years, and upwards, but their unfitness for grazing at an advanced age, usually occasions a period to be put to their lives, before they reach their ninth year. This consideration, however, is far inferior in magnitude to that of breeding good stock, and I should be inclined to preserve a thorough shaped animal of either sex, as long as the power of procreation remained. Such are never in immoderate plenty, and to the defect of precautions of this kind, probably, we may attribute the too common degeneration of races.

Where cows are kept merely for dairy purposes, and

without any intention of rearing the calves, or upon the cheap plan of rearing without regard to breed or quality, the bull is a very inferior object of consideration, it being required simply that the cows are served in due time. The bull thus generally goes with the cows, and a single bull will suffice a very considerable number: he is perhaps *segged*, or castrated for fattening in his third year. But an improving breeder should keep the bull, as the stallion, by himself, with the view of making the most of his vigour, introducing each female to him, singly, in her proper season. It must, however, be acknowledged, that cows sometimes continue very unquiet without the company of a bull, leaping each other, and straining those which are in calf. In this case, great watchfulness is necessary, when it is an object to keep the bull apart, and on the first symptoms, each cow should be presented to him. There is a certain capriciousness amongst these females; they will frequently shew strong symptoms of heat, and yet will not admit the bull. When this happens, it is perhaps the best method, to confine the cow as is practised with the mare, and if she be really in condition, the bull will do his duty. I apprehend the chief reason why a bull will not act, unless the cow be in heat, is that he is usually satiated and exhausted. *Bullocks* should not be left in the company of cows, being apt to leap those which are bulling, injuring both the cows and themselves. To present the cow to the bull, with her full udder, is a maxim, the utility of which is confirmed by experience. Not only the bull, but the cows also, must be thorough-shaped, to produce the desired result; and thorough-bred of their kind, unless some improving cross be meditated, an uncertain business, and requiring much experience.

The bull will, in course, be kept in high condition,

but moderate labour will, by no means, injure his generative faculties. Cows in calf, without being made fat, should always have a sufficiency of nutritious food, throughout both summer and winter, and in the latter season, should be sheltered from the inclemencies of the weather, in good fold yards or sheds. Straw alone is of insufficient nourishment, and should be aided by hay, turnips, cabbage, or some species of winter provender. This additional expence is repaid by the superior condition of the cows, by the greater quantity and richness of their milk, and by the superior size and form of the young stock. However well shaped the original stock, the produce will ever degenerate from the meagre and insufficient keep of their parents, nor can it be fed so early or so quickly. The standard size will diminish, the legs increase in length, the form become irregular, and the muscles lose their plumpness. From the various abortive attempts we witness, it is necessary to give a caution respecting half measures, whether of the stock itself, or of their provision or management; such may possibly make proportional approaches towards perfection, or first-rate quality, but it ought to be obvious, can never reach them.

The cow, like the mare, experiences her periodical desire for the male, indifferently at any season of the year, but in breeding calves for rearing, it is doubtless preferable to adopt the system of the stud, and so manage, as to have them dropped in the beginning of the warm season, and during the growth of the spring grass. Winter rearing is expensive, and all young animals are tender, and injured by cold. In cow-keeping, purely for the sake of the milk, the case is different, and no opportunity should be passed of the cow receiving the bull, since the object is to renew the milk, as often as possible, and since fresh milkers

are equally desirable, in winter, as in summer. The cow, well kept, will seldom miss her periodical heat, the first access of which is usually soon after her calf has left her. The cow which is desired to remain in perfection, either for milking or breeding, should not be exhausted by drawing her milk too long after she becomes heavy with calf, it is to pay too dear for a present supply of milk. She should be suffered to go dry, at least, two months before calving.

We are discoursing at present of breeding for the purpose of rearing the calves, but since our best stock afford such considerable quantities of milk above the demand of their calves, and since milk is so valuable a product, it is generally and necessarily a mixed affair. In some butter and cheese dairies, they rear a part of their stock. Where they rear all, there is yet a surplus of milk to be converted to some purpose of profit, and this surplus may be used in the rearing of purchased calves, by which means, a breeder may rear annually double the number. It is true, in some poor and mountainous districts, the native breed may afford so little milk, that the cow's produce is barely sufficient for the maintenance of her calf, in which case, the calves ought to suck their dams, constantly accompanying them, until they can be sustained by grazing, when no time should be lost in their separation, that the cow may be ready to receive the bull. Some very excellent small beef is the result of this system of management, obviously that of times anterior to any attempts at improvement, which usually introduce the cultivation of cattle crops, and a larger and more milky breed.

It is absolutely necessary, for the prevention of accidents, and in order to the best management, that memorandums be made of the day on which the cow received the male; the day also, of her bringing forth,

should be regularly noted, as a future guide, and for other useful purposes. Where much breeding stock is kept, a stud book is indispensable, and it may serve for every species, neat cattle, horses, sheep, and swine, not only for the entry of breeding dates, but of various other useful memorandums.

The progress of the cow in her gestation being duly watched, every needful assistance may be administered to her, immediately before, and at the critical moment of parturition. It is the custom in some parts, to decrease the quantity or quality of keep, a few weeks previously to the cow's calving, with the view of lowering her condition, least her being too full of flesh may be an impediment to her delivery, by narrowing the circumference of the passage. I am led both by theory and observation, to disapprove this practice. It appears to me, that by reducing the keep, we also reduce the muscular powers of the animal, and thence the energy of her throes, so necessary to the ejection of her burden; and the greater number of difficult births which I have noticed, seem to have proceeded rather from weakness, mal-conformation, or over-driving, by which the calf may have been disturbed, than from fulness of flesh. Nothing, however, can be more improper, on various other accounts also, than over-fatness in the female, and it is a strong objection to those breeds, which have so great an aptitude to fatten, that they are uncertain in procreation, and fall short in quantity of milk, one of the most precious of nature's productions. A judicious breeder will preserve a proper medium in this affair, by observing with the females of whatever kind, such a regimen, in respect to keep, as will impart to them sufficient nutriment, without overloading them with fat: as to the too contracted form of the pelvis, in certain breeds or individuals, it admits of remedy by

improving the form of the breed, and by imparting a greater capacity to the hinder parts.

The immediate objects of care with the parturient COW, are CONVENIENT PLACE—HER STATE OF BODY, PARTICULARLY OF HER UDDER, WHICH IS SOMETIMES SUBJECT TO INFLAMMATION, FROM SUDDEN DISTENTION WITH MILK—WHETHER SHE REQUIRE ANY MANUAL ASSISTANCE TOWARDS HER DELIVERY; ANY MEDICAL HELP AFTERWARDS; AND WHETHER, OR NOT, IT BE NECESSARY, TO REMOVE HER TO THE HOUSE OR FOLD YARD.

There is nothing, of which long and repeated experience has rendered me more certain, than the gross folly, as well as inhumanity, of suffering our domestic animals to bring forth in exposed situations, and subject to the injuries of wet and cold. It is in the warm season only, that they can remain, with safety, unsheltered. In winter, spring, and autumn, out-houses, sheds, or well-sheltered fold-yards, are the only safe and proper places, and in case of cold rains, or piercing winds, even in any season, a covered place is preferable. As may be rationally expected, from so great a change, all new-born animals are extremely susceptible of the impressions of cold, as are also the dams, from the indirect or temporary debility induced by the act of bringing forth. Now although numbers escape, by virtue of the common chance, through which other perils are avoided, yet many of the young animals fall an immediate sacrifice, and more are, in consequence, afflicted with latent disorders, which militate greatly against their future improvement: and although the dams are not so often fatally affected, they very frequently sustain injuries from which they are never afterwards thoroughly recovered. *Milk fever, retention of the after-burden, or cleaning, peripneumony, chronic cough, and a species of consumption attended with the symptom called hide-bound,*

staring of the coat, and falling away of the milk, are the maladies which I have, too often had occasion to attribute to the above origin. It is a fallacy, natural enough, I acknowledge, that exposure to all the risks of climate, contributes to the hardiness of live stock. But whoever will take the trouble of the experiment, will be convinced that gradual exposure is not only more safe, but far more contributory to the desired end than the abrupt and sudden change. The analogy of wild animals is not fairly stated, an important member of the proposition is overlooked; the numbers which perish from the inclemency of the seasons are not noticed, which by domestic care might be preserved, and yet afterwards gradually inured to cold, and rendered fully equal in hardiness to those which have survived the risks of being reared in the natural state. It further deserves consideration, that there are ever individuals of such as are esteemed the most hardy breeds, which no possible means will render equal in that particular, to their fellows, and which yet, with proper care, may be rendered equal to them in profit. This is a point for the exercise of judgment in the breeder.

I have somewhere heard the following anecdote of the late Mr. Howard, the celebrated philanthropist. One of his cows had recently calved, and a servant, having secured the beast in a stable, was in the act of carrying her a pail of warm water, when he was met by his master, who ordered him to take the warm water away, and exchange it for cold, and if I remember aright, to return the cow and calf to the field; correcting his more practical hind, with some theoretical observations on the preference which must necessarily be due to the natural state and habits of animals. I have not acquired the right to judge of Mr. Howard generally, but in this case, he seems

like many other great men, to have systematized on partial principles; a practice which we every day witness to be productive of cruelty in some form or other, even in minds naturally disposed to tenderness.

The following extract I have made from a letter, in the *Scotish Farmer's Magazine*. It is evidently penned by an old practical farmer, of much experience in the breeding line, and does singular credit to our northern veterinary œconomy. It is farther particularly entitled to attention, on one or two counts, touching which I shall afterwards briefly remark. "My cows, when bulled, are regularly noted down in a book; and when they are near the calving, they are watched frequently night and day. How soon the calf is dropped, it is received into a large basket, or skull, made of willows, with a handle at each end, and plenty of clean straw in it. It is then carried by two persons to the stall in the calf-house, where it is gently rubbed and dried with straw. My calf-house is next to the cow-byre, and is fitted with stalls like a stable, about three feet wide, and about five feet long. Every stall shuts in by itself, with a door and hinges, for fear of the calf lying back too far, to choke itself in its binding. How soon the mother gets a little rest after calving, she is milked, and a little of the milk given to the calf, as early as possible. If the weather is cold, and the mother long in giving milk, it is taken to the fire and warmed in a pan, until it is blood warm, and then given to the calf, about six or eight gills, according to the size of the calf, and repeated four times in twenty-four hours. As the calf gathers strength, the quantity may be increased; but too much of milk at one time is as bad as too little, until it is a month or six weeks old. When the calf is able to stand, I tie it to a stake, as it is more in the power of the servants to give it milk:

in that situation, than when going about loose. If a calf gets cold milk, it is sure to bring on a trembling, and the cords, or some other malady, follow, which I have often seen exemplified amongst the young stock of my neighbours. The above has been my scheme of treating calves; and I have never had one die of the cords, if fed in this way, and kept dry."

My intended remarks are on the cords, and wiping dry the newly-fallen calf. The disease called in the North the cords, appears to me to be convulsive and spasmodic contractions, the simple effects of cold caught. As to cleaning and drying the calf, I have ever thought that, when practicable, it must be far better for the dam, than to suffer her to lick it, a necessity imposed by nature upon brutes, which must be, in a certain degree, injurious to their stomachs.

Cows which bring forth abroad, in course, drink cold water, but if they chance to get cold, and are feverish, they are very apt to increase their malady by large draughts of water. Whenever it shall be found necessary to bring them home to calve, or immediately after, it will prove the safest practice, and should be a general rule, to allow warm water, or rather that which is called white water, having oatmeal or pollard in it. The warm regimen will be found very friendly to the constitution, and promotive of the secretions, which may have been suppressed; and the cow will much easier afterwards regain her pristine hardiness, than if she had continued exposed to the weather, whilst in a state of debility. I have enlarged considerably on this subject, of such real consequence in our fickle climate, in the Treatise on Horses, to which I refer the reader, particularly to the case of a foal, which I recovered by artificial warmth, and afterwards lost by a premature exposure in the field. Mashies and warming cordial drinks will

sometimes be necessary, to counteract the ill effects of cold, and to quicken the flow of milk. Perhaps my concluding argument in favour of preventive care will have more force than all the preceding; a cow suffered to take cold in calving will often lose, in three or four days, as many pounds of her value; to which may be added, the probable chance of a cow leech's bill, and the not improbable risk of a thorough recovery.

From an early conviction of the vast importance of this branch of veterinary care, towards every species and description of live stock, without exception, I have not failed to inculcate its practice, on all occasions, and will therefore embrace the present, to conclude on the subject of general exhortation. With this view, I beg leave to refer the reader generally to the *New Farmer's Calendar*; and as I cannot more fully express my sentiments, than I have already in the *Modern Land Steward*, and as I wish strongly to inculcate the use of *PLANTATION SHELTER*, in all exposed situations, I submit the following quotation to the judgment of the landholder and breeder. "I have great pleasure in recommending the circular belts of planting, proposed by Mr. Brodie, a Scottish farmer, and also in acknowledging the genius and light of our northern countrymen. As a concise term may probably have its use, in promoting this very excellent plan of winter-safety and comfort, in exposed situations, I beg leave to propose that of the *TREE-FOLD*. The tree-fold then is a circular inclosure of thickly-planted trees, suppose of eight acres extent, the central acre remaining unplanted, as a sheltered fold for cattle, with sheds or outhouses; the access to be made by a serpentine, or what would be perhaps preferable, a road broken into two deviations, for the purpose of preventing a current of wind upon the

fold. The road taking a straight course for a certain number of rods, might be diverted, in an acute angle, to the right hand, a like distance, and being again turned to the left, might be continued to the fold in a direct line.

“ The beech is very properly recommended for this species of plantation, as retaining its foliage throughout the winter, and being adapted to the worst, or indeed almost any soils; the more internal parts, however, might be planted with any kind of timber, and the defence remain yet complete, from the shelter afforded externally by the beeches; a growth of underwood also might be encouraged, rendering the whole plantation the most profitable possible employment of the ground in any exposed part of the country. Proprietors will see the necessity of instantly setting about a work of this kind, granting they are ambitious of enjoying its conveniences, on account of the length of time required to its perfection; which reasoning, indeed, applies, more or less, to every species of rural projection.

“ So long as the use of planting for its shelter has been known and recommended in this country, a considerate man endowed with sensibility, is almost at a loss to determine whether he ought to laugh or cry, at its gross neglect, upon our hills, sea-coasts, marshes, and other bleak situations. The loss and misery consequent upon this barbarous neglect has continued through a long series of ages; it is surely time, independent of the idea of present scarcity, to profit by measures, which, without risk, or possibility of failure, must be so eminently productive in the precious articles of flesh provision, wool, timber, fuel, manure, and above all, of blessed humanity towards those poor animals, whose lives it is surely sufficient

to take, without the enormity of starving and torturing them to death by inches.

“As many tree-folds ought to be planted upon a highland, or otherwise exposed estate, as are necessary for its full security; and this work may be completed, I should suppose, at an expense from ten to twelve pounds per acre at most, good substantial fencing included, in any part of the island; in some, for much less. The area may be made to approach the farm-yard in conveniencies, in any requisite degree; in the lowest, it may be foddered with heath, and replenished with stacks of the same, and of furze, good hearty winter-food; warm cots may be also run up, for shepherds and hinds, too many of which useful and indispensable inhabitants of the country have, at various periods, perished in the howling storm, to the foul disgrace of our ancient system.” P. 182.

I have been lately informed, in an exposed and hilly part of the county of Surry, that a gentleman boasted of the hardiness of his flock, the ewes of which were accustomed to lamb indifferently, on any, even the highest quarter of his farm, and that he was never solicitous to afford them shelter. He has since lost full three fourths of his lambs, by the severity of the weather. Great numbers of lambs have been also lost, this spring, from a defect of nourishing provision for the ewes, even in counties, the soil and situation of which are capable of producing every thing needful in profusion. It is even asserted, that from the alleged defect, the lambs reared this year will fall short of the number of the preceding, by full one fifth. A reference to the Board Surveys of Scotland and Wales, and the border counties of the former, or to Mr. Marshall's account of the sheep husbandry of Romney Marsh, even in the southern county of Kent,

or to the Lincolnshire reports, in which we are told of cattle starving in the fens during winter, to the extremity of devouring the dung, and even hair from each other's bodies: I say, such reference cannot fail, with rational minds, strongly to inculcate the necessity of a thorough change of winter system, in most of our breeding counties. Nor can I agree with the Lincolnshire graziers, who reject shelter for their fat sheep, on pretence that it renders them too indolent to rise in the cold, in order to take their food. Granting the fact, it would only prove the want of a more beneficial method of winter feeding, which doubtless might be pointed out. The constant tenor of my observation goes to prove, that all fattening animals are retarded, in their progress, by extreme cold, and indeed, under its rigour, are scarcely to be kept up to their pitch, by the most nourishing food.

The Rev. Charles Findlater's Survey of the county of Peebles lying opportunely before me, I am enabled to strengthen my argument, by a quotation of practical remarks from thence. This industrious and intelligent reporter observes, that—"prejudices continued long, in Tweeddale, against artificial shelters and winter feeding, for sheep, upon supposition, that they rendered them too lazy to dig the snow with their feet, in order to come at their natural food: both these prejudices have nearly vanished, being expelled by *experience*. Trees are in various instances planted for shelters. It would be for the interest of every proprietor of sheep-farms, to encourage the farmer to rear shelter of trees, by allowing him the weedings of the plantation, and becoming bound to pay the farmer, at the rate of perhaps eight pence, or ten pence a piece, for every tree left standing at specified distances, at the expiry of his lease: such an interest communicated to the farmer, would give the most effectual

security for the protection of the trees. Shelters are also procured by buildings, inclosing a square open area, in the middle, furnished with shades on every side. *Stells* (that is circular spaces of area, proportioned to the size of the flock, inclosed by a five or six feet wall of stone or sod, without any roof,) were the primeval shelters invented by our fore-fathers: the circular figure of the building causes the drifting wind, in snow storms, to wheel round it, without rising over it, and depositing the snow in the calm region within. The sheep are fed, in winter storms, with such provision as can be procured, under the trees, within the shades, and within the circles: even where no feeding is administered, much advantage results to the animals from mere defence against the weather; and they are *much the more alert*, in searching for their natural food, so soon as the storm ceases. The mode of acting of the sheep, gives a pretty certain indication of the weather to be expected: upon the near approach of a snow-storm, those accustomed to shelter, are observed to make for their shelter: upon the near approach of thaw, their pre-sentiment leads them to be less industrious, in digging the snow for food, as if conscious that such labour was no longer necessary." P. 194.

But the most formidable objection to the attempt of rearing plantations, is the opinion, that on certain marshes and exposures, trees will not grow, or rather perhaps, that it would be a criminal breach of custom in them, so to do. Nothing however can be more evident, than that they will not grow spontaneously, and without being planted. In the mean time, it will be allowed, there are, from one cause or other, such barren spots; but previously to giving my assent to mere customary and *practical* opinions (styled practical, it may be presumed, because the holders of them never change their practice,) I demand a fair

trial, and with plants adapted to the nature of the soil. They who desire to improve, ought to be equally suspicious of the nods and winks, and shakes of the head, and wise looks, and horse laughs, and other formidable arguments, of the proprietors of established and hereditary opinions, as of the magnificent reveries of the projector, whose head was intended by nature a mere machine for the elaboration of air. Some years since, I recommended oxen for labour instead of horses—"Absurd, impossible! it might do elsewhere, but never on the farm or in the district in question." Yet for the past three years, *inferior* oxen have been used, in preference to horses, on the very farm. How often have I ridden over a piece of land, and recommended the drill. "O! no! I defy all the world to drill upon land like this." In travelling half a score miles, or less, I have seen the same kind of soil, under the most level and regular drill culture. The instances are numerous, of its having been said—"Work that land without regular fallows, why you would be ruined, you would get no corn at all." Yet fallows have been abolished on that land, the hoe has been set to work, cattle crops raised, manure produced, and far more corn grown than under the old system.

In the preface, to the fourth edition, of the Farmer's Calendar, I have stated, that from inexperience in mountainous and exposed districts, I was unable to determine, how far a good winter provision of food and shelter for their flocks and herds, was practicable; and whether the great defects we constantly hear of in those essential points, were to be attributed to real, irremediable misfortune, or to the indolence, prejudices, or poverty of the inhabitants. A reference to the transactions of the respectable Highland Society of Scotland, has enabled me, at least, to make up my own mind, if yet unfortunately, I shall be unable to

impress my readers with congenial sentiments. It appears to me, then, most clearly, that nature must stand exculpated, and that, in the breeding districts of the northern highlands, there are no physical bars to the attainment of the most ample provision, of every requisite species, for their live stock throughout all seasons of the year. The richest of their vallies are fully equal to the production of our best cattle crops, and upon the poorest of their soils, the farmers have it in their power to secure an ample quantity of fodder hay for winter use, which, however coarse, is thoroughly acceptable, and adequate to the preservation of their store stock, in health and heart, during the cold season. These facts will be fully apparent, in the following quotations, from the above cited indisputable authority.

P. 164, Vol. II. "The arable land in the highlands, is in general of an excellent quality, and in many districts, not inferior to that of the south country—hazle mould, dry, easily cultivated, and of a forward nature.—When this land is suffered to remain ley, it produces the finest grasses. These yield excellent feeding for cattle in summer, but they are soon affected by the weather in autumn, and scarcely afford any pasture in winter."—(P. 166.) "The arable grounds, in the highlands are, with respect to soil, sufficiently adapted for the production of any field crop that is raised in Britain.

"All the hay, as yet, that is made, is still inconsiderable and only in some places, sufficient to fodder their stirks, or young cattle, in winter. It is every where made too, only of the finest grass; yet, in general, in the highlands, great quantity of hay might be made, which though coarse in its quality, would afford a sufficient sustenance, and tend to prevent that great mortality in spring, which frequently happens

from diseases occasioned by want of food. The plants from which this hay might be made are chiefly the following—

<i>Scirpus cespitosus</i>	Deers hair
<i>Nardus stricta</i>	Bent
<i>Aera cærulea</i>	Fly bent
<i>Juncus articulatus</i>	Spret
<i>Juncus squarrosus</i>	Wire bent

And many species of *carex*, which pass commonly by the name of ‘one pointed grass.’

“These plants are fed upon by the cattle in the beginning of spring, but they are neglected by them, as it advances, and affords finer and more palatable sorts of grass. In summer they are neglected by the cattle, and are not attended to by the inhabitants, though capable of being made into hay. But these plants, like many others, though avoided by cattle when green, are very acceptable to them when dry. In July, upon almost every highland farm, extensive tracts are covered with them, and afford a thick sward, fit for the scythe. At this season, they are untouched by cattle; in the beginning of winter, they decay and fall into straw upon the ground. In such places, from these plants, there might undoubtedly be reaped such a quantity of coarse hay, as might obviate the calamity to which the highlands are subjected, by the disease and death of cattle.

“It is true, that this hay would be of the coarsest quality, but wholesome, and such as the cattle would not refuse, when urged by want; it would be insufficient either to fatten them, or to enable them to yield milk; but these are not the objects of a breeding country. The plants of which this hay would be formed are of a hard substance, and hardy nature. They therefore withstand the winter better than any

other kind of grass. Even when decayed, blasted by the weather, and in the most sapless state, they are fed upon by the highland cattle. It cannot therefore be doubted, were they to be made into hay, during July and August, when fresh and succulent, that they would afford a supply of most useful provender in winter.

“ This hay should be preserved for use, till the middle of winter is past. The highland cattle never suffer much for want of food, till after the 1st of February; from that time, till the end of April, they are often in great distress, when this hay would afford a most seasonable and effectual relief.

“ *Clover and rye-grass* have of late been introduced into several parts of the highlands. In the Hebrides, they were first sown in the island of Ila, only in the year 1761. The tillage soil of the highlands, in general, is well adapted for them; they are as yet, however, cultivated in few places, and but sparingly. And though the rains in summer are very unfriendly to the making of clover hay, yet these grasses ought undoubtedly to be every where raised, in as large a quantity as possible. The method of their cultivation is now so well known, over all Scotland, that it is unnecessary to take notice of it here.”

Various of the bulky grasses are recommended for hay, and they would improve under the scythe. The *timothy* grass “ grows in great perfection, in some of the high and wet grounds of Scotland, and may reasonably be presumed would prove a valuable sown grass, in such parts of the country. *Holcus lanatus*. Soft grass grows dispersed in most parts of Scotland. Some years ago, its seeds were collected in large quantity, by the late Mr. Arthur Martin, in Fife, where after being sown, it afforded beneficial hay crops—It grows vigorously, in the highest and coldest

parts of Scotland, that are arable. Makes a great figure upon wet mossy soils, that have an admixture of clay. It vegetates in a greater degree of cold, and remains longer green, during winter, than any other of our native grasses. It therefore, very much deserves cultivation, not only on the highlands, but on all the higher districts in the south of Scotland.

“ *Avena elatior*. Tall oat-grass is capable of affording a greater hay-crop, upon poor dry land, than any other plant we have in Scotland, growing from three to five feet in height. It inhabits the driest and poorest oat-fields, where single plants and patches of it may be observed, which far overtop the stalks of corn. It is capable however, of filling the soil completely, as it does in some particular places.—Its seeds may be collected very clean and in sufficient quantity, upon the island of Inchcolm, in the Forth, where it yields a pretty large crop of hay, on a very poor soil. It affords a coarse, but very wholesome provender. It is of a firm substance, easily dried, and less liable to be hurt by wet weather, than most other grasses.

“ The mountainous tracks of Scotland which must always be pasture countries, are but too well known, to be insufficiently provided in hay, both for their black cattle and sheep. The grasses either of the southern parts of Europe, or of the low fertile lands in England and Scotland—sainfoin, lucerne, burnet, plantain, rye-grass, red, white, and yellow clovers, all requiring a dale country, and rich soil, cannot here be raised; but the want may undoubtedly, in a great measure, be supplied by some other hay-plant better suited to the soil and climate. And the most likely place for the discovery of such a plant, is certainly among the indigenous plants of these alpine countries.’

‘ Of all the mountain plants in Scotland, the *aira*

cærulea seems the best adapted for this purpose, known among the Highland shepherds by the name of the *fly*, or flying bent. It bears long, broad, and grassy leaves. Its stem rises between two and three feet high, and its foliage is remarkably thick. It grows in a soil of pure peat earth, and in the most exposed situation, on some of our highest mountains, where no other grass of any value is to be found. It appears usually in a straggling and dispersed manner: but in some places, it forms of itself, whole acres, with scarcely any other plant intermixed.'

'From the middle of May, to near the end of June, it affords the best summer feeding that black cattle and sheep have in the high countries. But when it grows long, they shun it, as they do all grass of a great height. It flowers, is in its strength, and is fit to be reaped, between the 20th of July and the 1st of August. It is a grass when green, eagerly sought after by all kinds of cattle; affords a heavy crop of hay; its seeds are very numerous, ripen well, and may be easily collected.'

GREEN CROPS. *Turnips*. 'Most part of the Highlands, and all the islands, afford the most favourable situations for the culture of turnips. The land to be chosen for the purpose, should be that which has been immemorially in tillage; that which is light, dry and very free from weeds. A piece of land of this sort, is to be found upon almost every Highland farm, the winter weather also, which is generally open, moist, and free from intense frost, is exceedingly favourable for the production of this crop.'

Rutabaga and *Mangel Wurzel* are recommended, and particularly the Dutch red cabbage, the hardiest of all that tribe, but I believe possessing the least nutriment. The brown German borecole, it seems, deserves the preference, not only as it affords a

weightier crop, but as more hardy. The next in goodness, of the *kails*, is the red, curled colewort of Ayrshire, known in the west, by the name of *Kilmaur's kail*. *Whins and broom* are recommended for unimproved districts. Tares are not mentioned, although by the description of the soil and climate, there can be no doubt of their success, in a very eminent degree, both as green food and hay.

Ought we not to receive, with astonishment, the following detail of customary annual mortality and loss, in a country abounding in such ample means of plenty, convenience and comfort?

(P. 168.) 'Almost the whole of the black cattle and horses run abroad all winter, without receiving a mouthful of dry forage; therefore a climate cannot be accounted intolerably severe, where this is the case; for there are but few tracts in Europe, where a horse can live, the whole year round, upon what the fields spontaneously produce. And wherever he can subsist, in winter, on the wild herbage, the green cultivated crops of that season may undoubtedly be raised to advantage.

'Cattle have always been, and must be, the staple produce of the Highland countries. Yet the great losses that are sustained by the death of cattle, in the spring season, from want of food, and the train of diseases that follow that calamity, are but too well known. They are indeed sufficiently fed in summer, but they are starved in winter; they are kept abroad the whole year round; during winter and spring, they receive no dry provender, nor any of the substitutes introduced by modern husbandry; and have nothing to support them but the decayed gleanings of the herbage of the former summer. The pasture fields are not sufficiently stocked in summer, that some remains of the grass may be left on the ground, for

the subsistence of the cattle, in winter. In this way, a great part of the produce of the summer is let run to decay, and is lost, without affording a sufficient supply for the pressing exigencies of winter.'

'To procure sufficient subsistence for the cattle in that season, may therefore be considered as the great postulatum in the agriculture of the Highlands.'

'The Highland cattle are not, and cannot, from their immense number, be housed; the same is the case with the extensive herds of cattle in Galloway. The practice there ought to be the practice in the Highlands. For though the cattle are kept abroad, all winter, they are there regularly supplied with dry forage. They are brought down every evening to a sheltered grass field, where the farmer and his servants carry out trusses of straw, or hay, which they spread about among them. The cattle feed upon this all night, and manure the soil, almost as well as if in a fold. They are at first driven to the place; but after a few days, they of their own accord, repair regularly in the evening, and sometimes from a great distance to the spot where they are to be foddered.'

'It is by the loss of cattle, that the Highland farmers generally suffer materially, or are often ruined in their circumstances, and the revenue of the proprietors is thereby impaired: a calamity which must frequently happen in the present situation of the country, the cattle having no provender, but what they can find in the fields, are reduced to an impoverished state. They can subsist for the most part till about Candlemas, upon the decayed herbage of the former summer. But from thence until the return of the grass, they are always, even in the best seasons in great want. If the winter is severe, and the spring backward and inclement, it is deplorable to think,

that a third, an half, and sometimes a larger proportion of the cattle upon a farm perishes for want of food.'

(P. 137, Vol. I.) ' In the hard years, 1782 and 1783, many of the people would have actually perished, had it not been for their milk. They had in several places recourse to the expedient of bleeding their cattle, every week or two, in rotation; and of the blood, boiled up with a little meal, they formed a substitute for bread, that kept them alive, till their potatoes were ready.'

P. 189, Vol. II. ' If upon any Highland farm, ten weeks either of dry or green forage, can be secured for the cattle, to be given them between the 1st of February and middle of April, which, by one or other, of the above methods, may unquestionably be done, *they would be then as safe from the spring mortality, as any cattle that are kept abroad all the year, in the south.* The breed of cattle would be improved, and the annual produce from every farm increased.'

In so plain a case as this, it is really admirable, that the conduct of rational men, through a series of ages, should be so little influenced by the sentiments, either of common humanity or dear and obvious interest. Surely those men's hearts must be hard, and their minds totally unversed in the most common rules of calculation, who can endure to behold animals, which have been reared at great care and cost, dropping down dead by scores, from absolute famine, or incurring diseases, and pining away their value, so difficult to be regained, from the want of nourishment for the mere support of life. Is it to be conceived that it should be necessary, to address mementos like these, to our great and enlightened landholders, who, as well as the public, must perceive so considerable a defalcation of profits, from a system equally absurd

and ruinous? In fine, I apprehend the following propositions stand sufficiently clear—First, that all countries which will maintain a stock of cattle during the summer season, will also afford a sufficiency of some kind of food, for their winter sustenance: Secondly, that it is the interest of the feeder to provide such winter sustenance: and lastly, that on the question of going to the utmost extent of number; the balance of profit would rest with superior quality, and the smaller number of animals sufficiently winter fed. If we reckon the possible improvement to be made, in the size and quality of the cattle, the almost absolute exemption from loss by mortality, and the power acquired of superior amendment to the lands thereby, we shall find the culture of winter cattle-crops an object of the highest importance to the country of which we are speaking, to the breeding districts of Wales, and to every other country, where breeding of cattle is the chief dependence.

I can, at no rate, accede to the opinion, given as above, that—“the Highland cattle *cannot*, from their immense number, be housed.” Doubtless they can, and at an expence diminished in proportion to the magnitude of their number, according to the well-known advantage which gradationally attends the large scale of business. It is farther, a legitimate presumption, that in proportion to the number of a man’s flocks and herds, is his ability to provide for them. The great affair is, how does the provision, of which we are speaking, agree with the pounds, shillings and pence?—Would it pay, to house, occasionally, in the winter, half a dozen head of cattle? Prove that to be the case, and it must pay still better, to house as many thousands.

In changeable weather, frost and thaw, in continued rains, in stormy, piercing winds, in deep and continued

snows, all animals exposed to the elements, must suffer heavily; and their meat, however nutritious, can afford no more than the mere support of life. With the young, the old, and the delicate, the utmost risk must be incurred. Disease and injury to the constitution cannot be avoided: but is there nothing, in the avoidance of all, or great part of this, to repay the charge of the means; or would the charge, to look forward to the duration of a lease, exceed the probable advantage? After all, I am only contending for common unexpensive sheds, yet such as would afford perfect shelter for the cattle, by night, or day, whenever they sought it. These must be adapted to local convenience, a regular distribution made of the herds, and a sufficient number of careful hinds provided. I mean, however, to speak in the positive degree, with regard to the provision of *winter food* only. I have done with the subject.

REARING CALVES is practised in various modes, and in respect of the quality of the stock, generally with success apportioned to the goodness of the food, and the accommodations. The extremes are rearing with new milk, and weaning on the best provender; or with any slops which will keep the scouring and emaciated animals alive, and wintering often, on straw alone, and summering on the common. The medium consists in giving skimmed milk, with meal, on which good middling cattle may be reared, as I have often experienced, even with the largest breeds; but I still prefer the allowance of new milk, obliging a cow to suckle two calves, which may run with her if the season admit, otherwise, may be confined in the house, and the cow introduced to them as often as possible. The breeding cows being valuable, as milkers for the dairy, it will turn to best account, to purchase nurses of inferior value, which may be either

retained in the same service, or fattened after weaning the calves. A cow has sometimes reared three calves, perhaps with some small help from linseed and hay tea, and by such method a numerous annual return may be made. Old milk may at first gripe, and disagree with the calves, but the inconvenience will gradually wear off with, often without, the usual assistance of drenches. I could easily adduce comparative estimates of the expence and return of those, and indeed all the various modes of rearing in use, having, scores of times, amused myself in forming such; but the breeder will do it for himself, to much better purpose, with his own proper materials for calculation before him. This risk is infinitely less with good, or the best keeping, and in times of quick sale, profit ever in proportion to merit. Animals which have been high fed, in the belly of the dam, and reared afterwards, upon her milk, will ever feed earliest, and make the greatest proof. I must yet acknowledge, that in former and cheap times, there existed a strong temptation to breed at as low an expence as possible, and so endeavour to substitute number for qualification.

To proceed to the various substitutes for milk, in rearing calves.—HAY-TEA is usually made as follows. Fill an earthen vessel lightly with the finest hay, for goodness and flavour, well shaken and cleansed from all impurity; pour upon the hay as much boiling water as can be contained, and stop close for two hours, when it may be cooled for immediate use; and no more ought to be made than will be used within the day, as it will become sour or putrid. This infusion is doubtless impregnated with the qualities of the proper and congenial food of the animal, but still it must be recollected, of the animal in a more mature state, and I must own, that from a few trials, I

cannot much recommend its use. It scoured my calves, and made their bones very prominent; on which account, I tried it no more. The allowance was about one third hay-tea, to two of skim-milk, thickened with meal.

Linseed-jelly. Mr. Crook of Titherton, Wilts, a breeder and grazier of great note, has reared many calves upon this article. One quart of seed to six of water, which, by boiling ten minutes, becomes a good jelly; this, mixed with a small quantity of hay-tea, is fit for use. Three sacks of linseed at 4s. 6d. per bushel cost £2. 5s. and weaned 55 calves. The boy who attended the calves had sixpence a day. Mr. Crook's calves did well on this treatment, better than those of his neighbours who allowed milk. He was presented with a piece of plate, by the Bath Society, for this information.

The late Duke of Northumberland's receipt. To one gallon of skim-milk, add half an ounce of common treacle, and one ounce of linseed oil cake, finely powdered. Mix as follows. Stir the treacle in about a pint of the milk, until they are thoroughly mixed; with which also, incorporate well the powder, by stirring it, whilst dropped gradually with the hand. The mixture then to be put into the whole of the milk, again well stirred, and given milk-warm. I have stated my preference of this composition in the Farmer's Calendar, and will venture here, to suggest the trifling alteration of coarse sugar, in lieu of treacle, as the former will sweeten better, and is probably more nutritious. Where linseed itself is more easily procurable than the cake, it will equally suffice, and in case of scouring, in the animal, rice gruel, or that of oat-meal, will be found a valuable addition.

The use of meal and skim-milk, in rearing, may

be seen by a reference to the New Farmer's Calendar, P. 489, fourth edition. The last calves I reared, I made use of skimmed milk and second flour, sometimes oat-meal. Began the first week in March. The calves were of the large short-horned breed, and consumed daily, at three meals, three quarters of a pound of flour each, boiled up in skimmed milk; it required the milk of more than two ordinary cows, to supply two calves. In a few weeks, they began to eat fine rowen, to which they were first tempted by its being made up into twists or bands. Flour omitted May 14: milk, in part, June 1; totally, June 8, when they were turned into good grass. They were kept in part of a spare barn, at first, afterwards running out and in; but warmth and good bedding appeared of the first consequence to them, being affected by cold and change of weather; one particularly, scoured a great deal, and always seemed affected by crudities on the stomach: the remedy, occasionally administered, and always successfully, for the time, was two small teaspoons full of rhubarb, in a pint of gruel or hay-tea. The animal could not absolutely have existed, without this aid, during its milk course, and died afterwards, rotten at grass. One of the small breed, which would not make fat for the butcher, with the best milk and attendance, but heaved, losing flesh daily, and in fact laid dying in the pen, I ordered to be put among the weaners; upon the diet of which it recovered, from the instant, and made a small, but strong and hardy cow. This calf was spoiled by the mother of her, a good large beast, being half starved when pregnant, upon a common. The above will be acknowledged substantial feeding, but I am still inclined to believe that had the best of these calves been allowed to suck, she would at three years old (the time she was sold) have produced

more by two pounds than she actually did, and I believe it is so in general; a consideration for those whose business it is to rear cattle.

In the North, when eggs are plentiful, they are given to weanlings in skimmed milk. In Leicestershire, they wean both by hand, and sucking; in the latter mode, allowing a cow to two calves: when weaned, turnips and hay, until grass time. Their cows calve from beginning of February to beginning of April; the heifers generally somewhat later.

Mr. Ellman's account of the Sussex mode of rearing, according to the Annals of Agriculture for 1789. —“The cow calves that are reared bring a calf at two years old, which runs with the dam all the summer, for seven or eight months: such a calf they call a *burter*; and this method they reckon by much the best.” No man can dispute with any chance of success, either the superiority of this method, or the excellence of the Sussex cattle, and indeed stock of all kinds, live or dead. Here we come to the point, will any presumed economical or artificial modes of rearing produce cattle, equal in all respects, in early breeding, milking, proof, and quality of flesh, with the above? It appears to me an axiom, that they cannot.

The management of their MILCH COWS, in CHESHIRE, is so truly excellent, that the heads of it well merit transcription from the report of that county; and if the practice be general, Cheshire may surely challenge a superiority over all England in this respect.

Cheshire is not numbered among our breeding counties, nor is any species of stock thence denominated, unless we adduce their justly celebrated breed of cheeses. They nevertheless breed a great number of cow cattle for their own dairy use, and perhaps no where is to be found such a medley and

jumble of different races.—Lancashire long-horned, Holderness, Shropshire, Welsh, Irish, Scotch, Stafford, Derby, New Leicester, have all been periodically introduced into the Cheshire dairies, and their present home breeds are a mixture of all these. Should these become known as a settled variety, no term could be more appropriate to them, than the *omnium gatherum* cows. Milking seems to be the sole object in rearing here. Their favourite points, “large, thin-skinned udder, and full milk viens, hide not material, shallow and light fore quarters, capacious behind, wide loin, thin thigh, white horns, long thin head, brisk, lively eye, fine, clean chops and throat, general symmetry and beauty no object.” Connect with this Mr. Axford’s opinion (Bath Papers) “Heifers intended for breeding, should not be bulled till the fourth year. The third, fourth and fifth calves are the best to breed from. Cows to breed from, should have eight or ten white teeth in their jaw; the breast broad, the tail long, the veins of the belly distinguishable, the brace of the naval large, a broad forehead, large black eyes, wide nostrils and ears.” As to keeping heifers fallow until the fourth year, and giving a preference to the fourth and fifth calves, or to this or that colour, I have never found such ideas to deserve much attention. A cow capacious behind, with roomy and thin-skinned *tackle*, and light and fine forwards, will generally prove a good breeder and milker.

To return to Cheshire—with respect to purchased stock, they prefer, on experience, the BROAD-HORNS; by which I suppose, they mean the half long-horns, or the produce of the Lancashire long, and Yorkshire short horns, forming a union of quality and quantity of milk: these for their richest pastures; for their poor soils, they have a short-legged breed,

hardy and of inferior size, resulting from a Welsh cross. They prefer their home-breds for the dairy, experiencing, that purchased cows do not reach their full milking, until the second year, if they come from poor land.

They hold cows to be in their prime, from four to ten years old, and keep them as long as they milk well, indeed until they are fit for nothing else. I mean to make the exception of capital milking, which I should be tempted to keep, even to twenty years of age, but I yet think, generally, cows are not at their best until five years, and on the decline, at eight; when, I apprehend, it must be the interest of a dairyman to sell, or put them to keep. I think few can suffer such an exhaustion as constant milking, to the eighth year, without deterioration. If the quantity holds, the milk becomes poor, and the appetite of the animal increases. Three such will eat considerably more than four fatting beasts. They find here, as elsewhere, that great milking and great proof in beef, are incompatible. Cheshire cows fatten to seven score pounds per quarter upon the average. Colours red, brinded, pied, and almost always finched, which last mark is a token of the predominance of the Lancastrian, or long-horned blood. I am inclined to doubt the utility of so much crossing, as is practised in this district, and to prefer the established varieties.

REARING. Calves are dropped in February, or March, and chosen, for stock, from the prime milkers. Kept on the cow three weeks, then fed on whey, with a little meal or linseed. One quart of meal or flour, mixed with forty quarts of whey, is the stated allowance of ten calves, for two feeds, morning and night. Fed but once a day, towards the end. Turned to the best grass when ready. Hay first and second

winter, perhaps straw the next. Bull'd at two and half years old.

The WINTER-FOOD of cows, in Cheshire, wheat, barley, and oat-straw. The two first kinds make cows go dry sooner than the latter, and wheat supposed better than barley-straw. It is curious to consider the local opinions on oat and barley straw, as fodder—In Hampshire, and I believe pretty generally to the westward, barley-straw is preferred; whereas in Middlesex, Essex, Suffolk and Norfolk, that of oats is generally held superior, or rather, the other is said to be good for little, but to make cattle lousy. I am convinced, however, this is merely difference of opinion, not of quality in the articles, as the produce of different districts. I have found oat-straw every where superior, but I don't care how little I give, even of that, to milch cows. The small quantity of cream produced by straw feeding abounds but little in the buttyraceous principle, and as every dairy woman well knows, is very difficult to churn.

It is probable, straw is even here too much the substitute for hay, however much hay is given after calving; and in a scarcity of hay, chopped straw mixed with crushed oats. Their hay is salted in the stack, to preserve its moisture. The quantity of the latter, twenty, to twenty-five quarts, per week, each cow, from calving to turning out to grass. They are taken into the house in the middle of November (rather at the latest I think,) and kept dry ten weeks before calving. Housed the winter through, but turned into the yard, or convenient home field, at ten in the morning, and fetched home, at four in the afternoon, or earlier if they desire it, or in case of bad weather; a practice the pure dictum of reason itself, and from which all encomium shrinks, as superfluous and useless. The Cheshire men wisely

make it a great object, to turn their cows to grass, in good condition, and as they say, “to start them fair;” alleging, that if otherwise, and their juices dried up with straw feeding, and the severity of winter’s cold, the animals are long before they recover their milking, if they ever do recover it, under such circumstances.

IN SUMMER FEEDING, a good range, and frequent change of pasture said to be of beneficial consequence to milch cattle. During the heats, some have a night and a day pasture; where water and shade chance not to be combined. In some parts of Hampshire, cows are fed at home, or in shady places by day, during the summer heats, and turned out upon the downs by night. The average consumption of a cow, in Cheshire, is calculated at three statute acres: in Leicestershire two acres and three quarters, or nearly seven pounds per annum. In Wiltshire, summer feed one acre and half, and a ton and half of hay during the winter, being the produce of two acres and half, in the whole.

The PERSONAL ATTENDANCE both of masters and servants seems to be most exemplary, and particularly unremitting at the critical time of the cows calving; on the well-noted approach of which, it is not uncommon for the cowman, and even the master, to rise several times in the night, to visit the female in the straw, and “to see whether any thing be amiss.” In general, the racks and mangers are cleared in due time, and kept constantly clean. A marked attention is paid to the individual appetites of the beasts; and immediately before he retires to rest, the master goes round, from stall to stall, and adds to, or diminishes, the quantity of fodder, as occasion may require.

HOURS OF MILKING, in the summer, six, morning and evening (the morning hour surely too late); one woman manages ten cows. The farmer himself attends the milking, assists in carrying the milk, and observes particularly, that the cows are well dripped, or the udder perfectly cleared of milk; for should any be left, it would not only be the richest of the milk, “each succeeding drop, which a cow gives at a meal, excelling the preceding one in richness,” but such negligence has the effect of causing a cow to become gradually dry.

For the MILK-HOUSE, a northern aspect is preferred, and it is desirable that it be so sheltered by buildings or trees, as to divert the sun’s rays throughout the whole day. An uniform temperature of the air within, ought to be preserved, the year round. In winter, a Buzaglio stove would best effect this. In summer, the end would be obtained by pouring spring water on the floor; and water should ever be at hand in a dairy. The expeditious cooling the milk, in summer, has considerable effect in retarding its acidity.

QUANTITY OF CHEESE made from one cow, in the season, of twenty-two weeks, from April or May, about 300 or 500 pounds and upwards. The former quantity accounted a good average for a dairy, accidents included. One gallon of milk makes one pound of cheese; and the dairy men are better satisfied with a cow which gives only eight quarts per day, through the season, than with that which has a greater flow; in which case it is proved, the milk is generally thinner and less productive of goods, and the cow liable to go earlier dry. The object of the dairies, in the choice of cows, is to obtain such as will produce the largest quantity of *goods*, that is, cheese or butter, and of beef. This detail of Cheshire practice will

not, I trust, be unacceptable, either to readers in want of information, or to those who already know how to appreciate that which is good.

In the earlier stages of PREGNANCY, they, who are accustomed to cattle, will feel the calf by pressing the hand against the belly of the cow. The approach of parturition is discovered by the diminished size of the belly, by the tumid and enlarged state of the parts behind, and lastly by discharge from thence. Some of these tokens will be perceived several days previous to the event. The cow brings forth in a recumbent posture, and licks her young, to prevent any ill effects from which to the cows some have caused the calf to be immediately rubbed all over with salt. Care should be taken to remove the after-burden, or cleaning, as cows are apt to devour it. The calf being weak should be held up to the teat, and it is supposed necessary that he should suck the first milk, usually called beastings. It may, immediately after, if intended to be reared by hand, be brought to the pail (a wooden bowl is, at first more convenient,) where by first sucking the finger immersed in milk of the natural warmth, it will soon acquire facility in feeding itself. If the udder of the cow be inflamed and indurated or cored, friction and immediate applications must be used. Inflammation however, in course, forbids the use of rubbing the parts; in place of which, cooling and emollient ointments are proper. Should the milk of any particular teat come with difficulty, it should always be sucked, lest its use be lost; the butting and sucking of a strong calf are the most efficacious means of opening the obstructed vessels.

The after-burden should immediately follow the calf, or at least in a short time; it is sometimes, however, from the effects of cold caught, weakness, or accident,

retained, and comes away piece-meal, and the cow is much disordered the while; but it is also too frequently retained until it becomes putrid, and ruins the cow. I shall transcribe from the Farmer's Calendar, an idea that lately occurred to me, on the subject, from witnessing several cases of this kind, rendered hopeless by long duration and neglect. "I submit it to practitioners, whether, in certain cases, the extraction of the *placenta*, vulgarly called the cleaning, in cows, by manual operation, would not be advisable, particularly with those which have required assistance, and have yet not cleaned: numbers are yearly ruined by this retention. On this head, a cow-leech remarked to me, the danger to be apprehended of injury to the beast, by the operation, but such argument does not apply to a skilful and intelligent operator, who patiently watching nature's efforts, would do nothing with rashness and violence." P. 518, 4th edition.

Cows are well known to be much subject to ABORTION, slinking or slipping their calves, in an early period of gestation: it is sometimes epidemic, and thence people have supposed it even contagious. Cows slipping their calves in great numbers together, is perhaps endemial in marshy or fenny districts only. It may arise from debility, occasioned by the faint and slippery fog, or autumnal grass, or from any cause of great debility. This accident will also arise from the sight, but more from the scent, of blood, or carrion, in the pasture, the animal in a pregnant state having a considerable share of nervous irritability; hence the necessity of keeping such or any offensive objects from the sight or scent of cows. For example, if one cow should slip, the abortion should instantly be taken clean away, and the cow herself removed until perfectly recovered; or others may,

from sympathy, be affected in a similar way. A preventive course should be used with all which are suspected, and, if in time, I know by experience it may succeed.

The successful management of WEANLINGS, WHILST IN HAND, consists in protecting them from risks of getting cold; for all young animals are particularly liable to be injured by atmospheric vicissitudes—in allowing good beds, and keeping them perfectly clean—in the avoidance of overloading their stomachs—and in an immediate application of the proper remedy, in case of internal obstruction. I am sufficiently aware of the extra trouble; but it is certainly far preferable to feed calves thrice, instead of only twice a day. It ought to be remembered, that calves, particularly the weaker, are liable to crudities and indigestion, even AT GRASS, and have still need of the proper remedies, which will secure them from further harm, and accelerate their thriving.

The economy of the MILKING-HOUSE is a matter of considerable consequence, towards the comfortable management of a farm. The house itself should be sufficiently spacious, with a standing for each cow, and calf-pens conveniently posited. I have elsewhere recommended confining the cow's legs, as well as head, having much objection to random milking, because I have observed, that my quietest cows have, now and then, kicked down a good pail of milk, and sometimes when the commodity has been scarce. I think stumps of wood, fixed in the ground, to which each hinder leg of the cow might be fastened, would be preferable to any other method. It is probable that the extra labour of milking *thrice* a day would be repaid. This is said to be practised at Stirling in Scotland, but no where, that I am apprized of, in England, unless perhaps in particular cases of profuse

milking, or dropping the milk. Such practice, however, would doubtless force an inordinate secretion of the milky fluid, and exhaust the animal in proportion, an item not to be forgotten, in the prospective account of profit and loss. The highest feeding would be required.

The necessity of constantly DRIPPING, or perfectly draining the udder of milk, has already been insisted on, in the Cheshire report. The udder itself should be kept perfectly clean, and free of hairs, which may be pulled in milking, and irritate the cow. The teats, previously to milking, should be washed clean, by no means with milk, which is apt to chop and fret them, but water, and with soap if necessary. Soreness of the teats should be cured by *prevention*, but when that shall unwisely have failed, the next step, instant and unceasing proper applications. The same may be said of the *foul* in the foot, chops in the heels and legs, from the accumulation of dirt, or other incidental maladies. The cows should be kept as clean as possible, particularly their tails, from which else, the dirt and filth are so conveniently thrown into the milk-pails. It is strongly recommended to curry and brush cows in the stable method, like horses; a practice doubtless highly contributory to their health, whilst kept constantly in the house, but which would render them too susceptible of cold, if turned abroad. I however much approve keeping them thoroughly clean, by rubbing them twice a day with whisps.

The VARIOUS USES to which THE COW is applied by the farmer and dairy-man are—breeding, the manufacture of butter and cheese from the milk, feeding of swine from the skimmed milk or whey, suckling or fattening calves for veal, sale of the milk, which is chiefly carried on in large towns. By the latter,

obviously, the cow renders the largest profit, amounting indeed in a good milker to a great number of pounds annually. The butter and cheese dairy (the former perhaps ranking first) aided by the profit of pig-feeding, may be considered next in emolument to the sale of the milk, and suckling in the last place; this, however, managed at the least trouble and expense.

Local circumstances and inclination will determine the proprietor's choice in the application of his cows, but the nature and produce of the soil ought to be the farmer's guide as to the extent of his dairy; since a dry, upland situation, adapted to sheep stock, is by no means calculated for milch cows, which require the succulent grass, and full bite of meads, or of rich and luxuriant pastures, with easy access to good and plentiful water, without the necessity of harassing the cows by driving them any distance to obtain it.

For the first purpose, or milking for SALE OF THE MILK, as quantity is plainly the chief object, and not consistence, or great product of cream, the deepest milkers must be in request. These are to be found, as has been already said, in the Holderness variety of short-horns, or proportionally, in any variety, to the degree of short-horn blood.

For the cheese and butter dairy, the long-horned cattle of the midland counties, of Derbyshire, Lancashire, Westmoreland and Cumberland, and home-breds with the greatest mixture of the above blood, have long had a general preference throughout England and Wales: In Scotland, the Dunlop, Ayrshire, Fife and Orkney cows are preferred for the same purpose. It has been noted, that of late years, the short-horned cattle have supplanted the long, in many considerable English dairies, the superior quantity of milk making amends for the reduced quantity of

butter, by the greater pig-stock which may be kept, and the greater worth of the dry cows.

The general professed object of the considerable dairy-man, in the choice of his cows, is the union of deep milking with large size, which last he reckons an advantage, in the sale of the cow, either for immediate disposal as a barrenner, when exhausted by milking, or after having himself grazed and fattened her. The question of size is here very materially implicated, that is to say, whether *the proportionally greater number of small cows would not be more productive, both in milk and beef, than the smaller number of large ones.* This I am convinced has never been fairly and accurately tried, although the Suffolk, and more particularly the Alderney cows, uniting both quantity and quality of milk, and feeding well for beef, present a striking object of comparison. The beef too, besides its smaller size and fineness, would probably be made fatter, than the general run of cow-beef. It is true, we may bring the example of the Suffolk dairies, where they use none but their own stock, and of various others where all sorts and sizes are admitted; yet I have had the opinion of many dairy-men and salesmen of repute, respecting Alderney cows, and it has been universally against them, on account of the smallness of their size, and their turning to so bad account after becoming dry. For private families in South Britain (in the North it would be difficult to obtain them) Alderney, Suffolk, and Kentish cows are to be preferred: the middle and smaller sized Holderness are chosen by some, for their fine figure, and the beauty and variety of their colours. For our colonies situated under the tropical heats, I should give the preference to Alderney cows, with a fine-bred Holderness bull, or a Suffolk: it is necessary, I conceive, that the stock imported into such countries

be *milky*, on both sides; far more necessary, that the soil be productive in grasses, or succulent green food, or the import of neat cattle will prove a barren experiment.

The FOOD OF MILCH COWS is well known to consist of grass, in summer, and of hay and straw in the winter. Many actual experiments have convinced me, that to keep any lactiferous animal with poor and ordinary food, under the idea of economy, is purely deceptive; nor can any food be too rich, with the exception, that tending too much to the production of fat, although it may increase the consistence and richness of the milk, it may yet contribute to retard the secretion of that fluid, and reduce, in too great a degree, its quantity: nevertheless in case of great and excessive milking, or under the usual exhaustion from straw-feeding, and poor winter-keep, I am well convinced a good cow would return the cost of a certain quantity of corn continued for a time. I prefer, in this case, bruised oats, with fine pollard, and in times greatly different from the present, I have allowed an handful of malt. The effects of such generous keep will appear both in the dairy, and the grazing ground, or fatting-stall; and the value of twenty shillings, thus expended, will often render more than a five-fold return.

Cows may be summer fed with the artificial grasses, lucern, sainfoin, clover; or with tares or green corn, cut and carried to them, in the home-stall, or to any shaded and watered ground: and this method gives a facility to cow-keeping, in upland situations. It is affirmed by theoretical writers, that to feed cows in this way, increases their quantity of milk, a fact which various experiments compel me to disprove. With me it has ever had the effect of adding to the substance of the animal, and of diminishing the quantity of her

milk; probably from defect of the exercise she was wont to take, in collecting her food, and the selection of herbage she was enabled to make. The aggregate quantity of milk in a dairy may, no doubt, be considerably enlarged by the mode of keeping the pastures free from the wasteful tread of the cows, since a greater number may be kept, perhaps by more than one third, in the same extent of ground; an important object surely, whether individually or nationally considered. At the same time, the animals may be secured in the shade from the harassing and debilitating effects of the sun and flies.

The most salubrious and profitable WINTER FOOD for cows is good hay, assisted by certain articles which are both succulent and nutritious, commonly termed the green and root crops: these are enumerated and particularly described, in the New Farmer's Calendar. Of roots, the preference, in respect of nutrition, is doubtless to be assigned to the parsnip, carrot, mangel-wurtzel, and potatoe; and where the soil is sufficiently deep and rich, to produce such excellent provision, and the cultivator sufficiently enlightened and spirited, to enforce its culture, the business both of milking and grazing may be said to be carried on in a style of perfection. Kept grass, or fog, has also its use, as succulent food, but cannot be expected to equal, in point of nourishment, the above distinguished articles. With regard to fog, it would surely be highly advantageous, wherever practicable, to cut and carry it to the stock, according to the summer fashion; for the damage of winter treading and poaching, must be still more destructive of the provision, and detrimental to the land, than the same in summer. In short, milch animals, of all others, ought never to be wandering and starving about a farm, during the comfortless seasons of winter, or early spring. Cab-

bages are extremely productive in quantity of keep, but liable to several objections. They impart an ill flavour to the butter, of which, however, they occasion the product of a large quantity where aided with good hay; and as we have not hitherto attained the German practice of preserving them in the house, cabbages are liable to be lamentably reduced, both in quantity and quality, by the frosts. Good hay alone will make good butter, although from such dry provender the quantity will be small; the hay being mixed with straw, will in exact proportion to the quantity of straw, deteriorate the produce of the cow. To milk a cow upon straw only, is extremely injurious to her constitution, in convertible terms, to the profit of her owner.

On light and poor soils, it is, that the winter keeping of cows presents serious difficulties; for although during the summer season every purpose may be answered by the artificial grasses, yet the hay made of such, however substantial, is generally too dry to promote effectively the secretion of milk; indeed of hay made from the natural grass, the sort held proper for milch-cows is the soft and juicy, from low meadows, or in general, the second cutting, or rowen; by no means the hard and substantial hay of the uplands, more calculated to consolidate the strength of the labouring horse. For this reason, the softest meadow hay on the soils of which we now speak as far as it will go, ought to be reserved for the cows, and provision made of some succulent article which the land will produce, to spend with the artificial hay. Here, turnips seem to stand single, unless, on the better kind of light soils, we may add potatoes, which some feeders warrant may be successfully given raw to milch cows, joining plenty of good hay: also the tender green tops of French furze (see Farmer's Calendar for

culture and management) are said by a certain writer to equal even spring grass, in the production of butter. They are cut at Michaelmas, will continue to grow until Christmas, and be fit for use to March. Such are the best winter resources for milk, on light and upland soils. Malt-combs, or the skreenings of malt, oat-hulls and oil-cake, are likewise given to cows; the two former, I think, particularly when joined with turnips, tend to correct their weak, aqueous juices, afford considerable nourishment, and amend the quality of the milk, which I should suspect (for I have never tried it) must be very unfavourably affected by the latter. Brewhouse grains, so much depended upon in populous towns, where milk is wanted for sale, are found to increase the quantity, and reduce the quality, of the cow's produce.

The milk-product of a cow is extremely uncertain; the great expence to keep her well, is equally, certain: hence the importance of a judicious choice. Inadequate keep pretty nearly levels all distinctions of good and bad, or rather most degrades the former. Some (as perhaps I have before remarked) have entertained an opinion, that it is the food, exclusively, which confers a superiority of milk-product upon the cow; a mere indolent supposition, which may be converted into a certainty, by the experiment of two cows, of equal size and age, one of a milky breed, the other of different repute, or a common mongrel, kept at full allowance of the best food. Mongrels are kept in some districts, a jumble and medley bred from the refuse of all sorts, which devour the best produce, at least, in the summer season, without producing more than half the quantity of milk which might be drawn from a real good milch-cow: yet it must be acknowledged, that deep carcassed, short-legged homebreds

are sometimes found nearly upon an equality with the best reputed dairy stock.

The following account of the expenditure of a score of cows will serve by way of illustration; it will prove several facts, beside that of the great expence of keep. It will demonstrate, that the practice of letting cows to dairy-men, at so much per head, which prevails to the westward, is not the most advantageous mode of disposing of the produce of a farm. The public perhaps has seldom reason to complain of the high price of butter. This account, extracted from the *Annals of Agriculture*, was written by Mr. Bernard, of Romsey, Hants, about twenty years ago, at which period the letting price was only £5. per cow, and if I remember aright, it was in some parts of Somersetshire, only £7. last year.

“ The allowance to the dairy-man for the 20 cows was 35 acres of meadow for summer feed, which, at a moderate computation, would have produced 25 tons of hay, worth, exclusive of expence, 50*s.* per ton or £62. 10*s.* After hay-making 26 acres after-grass, exclusive of that fed at 5*s.* per acre, £6. 10*s.*—In the winter, they destroyed the fodder of 120 quarters of barley, and 27 of oats, which, as the straw ran long, and there was a considerable quantity of young clover in it, was not so little as 30 tons, value 20*s.* per ton, or £30. besides 12 tons of hay at £3. per ton, £36. Run of the barton, wheat and barley etches, cobbing for fowls, pigs, &c. £5. Keep of a horse for the dairy-man £5. House-rent £2. 10*s.* Fuel £5. Allowed for barren cows, casting calves, &c. the-rent of two cows £10. Interest of capital and risk, in large dairies, £1. per cow annually.

Dairy,	ACCOUNT.			Contra	Cr.		
	Dr.				Cr.		
	£.	s.	d.		£.	s.	d.
To 35 acres meadow grass.....	62	10	0	By 18 cows at £5.....	90	0	0
— 26 do. after grass at £5.	6	10	0	Dung	20	0	0
— 30 ton fodder	30	0	0	— Loss to balance	57	15	0
— 12 ton hay	36	0	0				
— Run of the barton, &c.	5	0	0				
— Horse keep	5	0	0				
— Rent	2	10	0				
— Fuel	5	0	0				
— Abated rent of 2 cows	10	0	0				
— Interest of £185. capital	5	5	0				
	<u>£167 15 0</u>				<u>£167 15 0</u>		

Mr. Bernard very justly gives a preference to spending his fodder and grass with sheep and lean cattle, in the spring, making them marketable by November, consuming his winter fodder with three year old heifers in calf, to be sold in the spring: by which management, he could keep as large a stock, and yet make more hay by nearly 40 acres.

It has been said, that on an average, three gallons of milk will make a pound of butter, or three pounds of new milk cheese: a thorough dairy-woman, at my elbow, says, the latter is far nearer the truth; that the former is very uncertain, depending on the nature of the cow, the quality of the food, the season, and the age of the milk, which in course loses much of its consistence, as it is distant from the period of calving. Certain capital individuals of the long-horned breed, have, in the prime of their milking, and in the summer season, produced twenty, and even twenty-two pounds of butter per week; a fact however so uncommon as to have few witnesses. Such an one, I

suppose, will afford an average of twelve or fourteen pounds per week, throughout the summer season, and afterwards, until she become dry (if well winter kept) eight or ten. I would travel some hundred miles, to purchase such a rare, and, on many accounts, valuable animal. A good, fair, dairy cow will produce, from her calving in May, until the approach of winter, an average of seven pounds of butter per week, from the quantity of three to five gallons of milk daily. Winter weekly average of butter four pounds. From an inferior cow, the winter product is scarcely worth the trouble of calculation, and never worth charge of her keep.

The profit of SUCKLING, or fattening calves for the butcher, depends materially on the quickness of the return, for calves, after eight or nine weeks old, require so large a quantity of milk, that they do not always pay for it; yet many persons are in the habit of keeping them until twenty weeks old and upwards, when they will each require the milk of several cows. Suckling is the least profitable, if it be the least troublesome branch of dairy business, and the calculation of profit given in Mr. Vancouver's survey of the county of Essex, where the business is much practised, is by no means flattering. The most advantageous stock for fattening calves are that species of cows which give the greatest quantity of milk, richness of quality being not so great an object, nor, in truth, so well adapted to the desired purpose. The Holderness cows are then to be preferred in this view, not however to suckle calves of the same, but of a smaller breed: perhaps Devon calves surpass all others as sucklers, whether for quickness of proof, or beauty of the veal; they are not however to be procured, but in, or near their own country; nor, I should suppose, even there, for such purpose, being so extremely valuable to rear.

A deep milker, in the first flush of her milk, will give a sufficient quantity for two, or more, young or small calves, but if circumstances demand that part of the cow's milk be reserved for butter, the last, which is the richest of the milk, should be reserved; the thinnest or first milk being sufficiently nourishing for the calf: and if the calves could be suckled three times, instead of only twice a day, allowing them still but the same quantity of milk, there is no doubt but the milk, in a smaller quantity, would set much easier on their stomachs, and contribute more to their speedy nutrition; for the chief reason of their almost constant suffering from acidity and crudities, subsists in the great load which is at once laid upon the calves stomach, after many hours of abstinence and pining. It requires considerable caution at the first suckling of calves, that their stomachs be not overcharged, in which case, obstruction puts an entire stop to their thriving, and is even fatal, as I have somewhat too often experienced: their stomachs must be inured by degrees to quantity of milk, nor should the calves be suffered to suck their fill, until towards the latter part of their time.

I have heard and read much of calf-coops for sucklers, where the animals have no room to turn themselves, and where the light is excluded; but I have no conception of the necessity of such measures, in order to make good veal. I have made with dispatch, as fat, and good veal, as Leadenhall market can exhibit, in common pens, without the smallest obligation to any of the aforesaid extraordinary precautions, which, in truth, I disapprove, as equally probable to induce disease, as to accelerate the fattening of the calves.

The CALVE PENS should be in convenient proximity to the cow-stalls; warm for the winter season, since

all young animals require warmth, which in fact is a constituent part of their nourishment, and possessing the means of ventilation in the summer. The bottom of the pen should be perforated boards, or at least sloping ones, that the urine may be discharged, and conveyed to the proper reservoir. Where only two or three calves are suckled, it is better to keep them separate; and they will lie quietly by themselves, if suckled three times a day; but when in company, they will sometimes get the ill habit of sucking each other. Where many are suckled, there ought not to be more than half a dozen in one pen. Perfect cleanliness and dry straw is necessary, and a calf that fouls itself, should be washed clean with soap suds, and well dried; as any filth suffered to adhere to their coats will impede their thriving.

In a scarcity of milk, to prevent the calves from declining in condition, the quantity may be eked out with water gruel, in which a small portion of milk has been mixed. At first the calf must be drenched with this, and in aid may be given two or three balls of wheat flour, made up with the gruel, to which some add gin. After a while, the calves will suck up the mixture from a shallow tub or dish, which, in my practice, has been found more convenient for calves than a deep pail, and they will even be brought to eat the paste from a trough or out of the hand. The trouble of these auxiliary measures must not be regretted, nor postponed for a day, after the due quantity of milk shall have fallen off, since the decline of the calves will be rapid, enraged by their restlessness and bleating, and they will speedily lose all the proof they may have gained.

Respecting the usual means employed to render the flesh white, all such are purely imaginary; the calf, which was brought forth with dark coloured flesh, will

never make white veal, nor has the colour of the hide any thing to do in the business. The chalk which is usually placed in the way for the calves to lick, can have no effect on the colour of their flesh, but by its absorbent quality, neutralizes the acidities in their stomach, brought on by an imperfect digestion of the milk; yet on account of its astringent or binding power, if taken in a sufficient quantity to be efficacious, it often adds to the obstruction, and increases the original complaint; thence it is by no means proper for such as purge or scour, in consequence of offending matter lodged in the stomach or intestines, in which case, laxative absorbents are the only proper remedies. Barley meal, with a quantity of powdered chalk mixed, is often given to calves; at any rate, meal is a good and wholesome assistant in fattening them; I should however prefer wheat meal, and omit the chalk. Warm water gruel, having a quantity of salt in it, and a table spoonfull of gin, will often purge off the acid crudities, which load and obstruct the stomach; and it will be found far the most profitable method to continue these little remedies, as they appear to be needed, throughout the whole time of suckling the calf, because obstruction and costiveness, or the scouring induced by acid crudities and indigestion, are great preventives of thrift. Another, but uncommon method, is to suffer a calf to run a twelve month with the cow in good keep, and fatten them for sale together.

FATTENING cattle for beef, is well known to be performed, by GRAZING them at liberty, in the pastures, or STALL-FEEDING, at home. The latter is most commonly practised, in the winter season, but it is equally practicable and beneficial in the summer: and the universal neglect of so certain a mean for the acquisition of great and uncommon profit, must go to the

account of our indolence, or our unaccountable prejudices. The success of fattening oxen, by mowing the green meat, of whatever kind, during the summer, has been often and fully ascertained. The meadows and pastures are thus preserved, and may be manured to infinitely greater purpose, by the saving made of dung and urine, and their superior condition and quality; and the herbage itself, secured from the tread of cattle, will go nearly twice as far and (these important hints cannot be too often repeated) the cattle may be kept secure, and quiet in the shade, free from every annoyance. Upon farms destitute of the great convenience of ox-houses; yards, or slight sheds run up in temporary inclosures, near to the grass intended to be cut, will prove intirely sufficient. The cattle will fill themselves, lie down quietly to ruminate, and under some circumstances, will improve much more quickly than if they had the liberty to graze. Nor does here lie any objection, as in the case of milch-cows. It will appear on experimental calculation, that the extra expence of cutting, carrying and attendance, is most amply repaid, in fact, that a very considerable additional profit is realized. The same may be truly said of drawing turnips from the land, in autumn, and stacking them for use, one of the most obvious profits in the whole circle of rural affairs: and yet we have men of great name, as cultivators, who reject this benefit, talking superstitiously of the great consequence to the land, of eating the turnips upon it; when nothing can be easier of demonstration, than that carrying the turnips home, and confining the beasts or sheep, will be the certain mean of providing a greater quantity of manure for the land, more of which may be laid upon the field where the roots grew, than would have fallen to its share in course of feeding. When treading a light

and loose soil is the object, the profit of stacking turnips is sufficiently considerable, to bear the expence of re-conveying roots to the field, in order to be eaten by the stock upon it. The avoidance of the damage by frost to turnips in the field, by which they are often half lost, and the remainder totally deprived of nutriment; or to the land, in the way of exhaustion, by their running in the spring; of the waste from the tread of cattle, and damage from the same, on the stronger soils, together with the advantage of having the roots in safety at home; of keeping the cattle secure and comfortable in a warm house, or yard, and the land free for any necessary operation—are privileges of so commanding a nature, as absolutely to throw into a ridiculous light, all arguments concerning the expence of pulling, carting, and stacking. I speak of that which I have seen and practised. This is also one of the late Mr. Close's strong points, and no one ought to understand the turnip husbandry better than that most experienced cultivator.

There is a sort of half-measure recommended in this case, namely, to draw a few weeks consumption of roots, and leave the remainder; by which I have sometimes seen this remainder suddenly overtaken and spoiled by the frost. The turnips ought all to be drawn and secured, as soon as they shall have attained as much growth, generally, as can be expected, and early enough to prevent the slightest effect from frost. It has been asked, where is the produce of a large breadth of land to be stowed? The same question might be asked in respect to corn, with equal reason. I have, in the Farmer's Calendar, described the common method of stacking turnips; some variation has lately occurred, a note on which, has been accidentally mislaid.

The most advantageous size of INCLOSURES for

grazing is an old subject of dispute. I apprehend ten, to fifteen acres, to be a convenient medium. Old grazing grounds are held to be best, because, probably, the new have been laid down in an unfavourable condition, and with rubbish. On this, and other important points in husbandry, I must remind the reader of a reference to the Farmer's Calendar (meadow and pasture). In large inclosures, division by a temporary fence may serve to economize the feed. Rubbing posts have their use, conducing to the comfort and quiet of the cattle, and to the safety of the fences and trees. In unsheltered fields, or marshes, the trifling expense of sheds is well repaid. Water in plenty is well known to be an object of great consequence to the health and thriving of beasts, in the summer season; and the low and muddy bottoms of ponds, evaporated by long continued heats and drought, more especially in warm climates, are extremely unwholesome, and indeed replete with mephitic, or infectious particles: the use of such has often produced contagious epizootics.

In laying out grounds, it may fortunately be practicable to make a pond serve several inclosures. On the discovery of springs and sinking ponds, see the Modern Land Steward.

Cattle ought not to be turned to pasture in the spring, until the herbage shall have attained sufficient maturity and luxuriance; in the usual phrase, until there is a full bite; and if it consist of the artificial grasses, great precaution is necessary, at their first meal, lest they gorge themselves to excess, and become *hoven*, or in danger of bursting; to which cows are still more liable than oxen. This does not happen with the natural grasses, nor was I aware that such effect would be occasioned by a considerable mixture of white clover with those, until within the last two or

three years, I have known several cows burst in such pasture. The methods of prevention are to feed the animals, and blunt their appetites, previously to turning them into the fresh pasture; to attend them for the first twelve hours, and prevent their excess, or drive them moderately about, in order to obviate its ill effects.

DAILY INSPECTION is obviously required for all grazing cattle, to prevent or remedy accidents, to observe their progress and condition, and to put up, or cause to rise, those, which from their great weight, or too sluggish nature, may be indisposed to the labour of sufficiently filling themselves. Indeed here lies the necessity of a good and full bite, more particularly when the beasts are large; and they should at any rate be moved to fresh pasture, before the herbage becomes so thin as to give them labour in collecting it, which might occasion them to remain stationary, if not retrograde, in improvement; the former of which even, is a diminution of profit. The pasture left by the forward oxen may be finished by sheep, lean or young cattle.

In long-continued rains, even in the warm season, and upon the firmest lands, cattle remain in a comfortless state, from their bodies being constantly drenched and soaked with water; their perspiration is checked, and their bodily functions generally disturbed; they become dull, and losing their appetite, improvement is at a stand. At the same time, and from the same cause, the juices of the grass become thin and watery, at length putrid. In this state, instead of nourishing the animals, when they so much stand in need of nourishment, their food scours and weakens them. Upon sound and wholesome soils, the cattle generally escape any farther ill consequences, than a temporary suspension of their im-

provement; but on fens, and lands which retain the water stagnant, that case is of far worse consequence. If the stock escape disease, they will, in a week or two, lose as much flesh, as it may have taken so many months to lay upon them, and afterwards it may be a long time ere they regain the thriving habit: but their bodies sodden with water, both externally and internally, and the animal juices vitiated, dangerous fluxes frequently supervene, terminating in that species of consumptive malady commonly called the *rot*, which may become epidemic. It is extremely obvious how much more dangerous this case must be, in the decline of the year, when the best preventive remedies are instantly required.

The remedies plainly consist in dry meat and shelter. As soon as it shall appear, that both the grass and the cattle are about to be ill affected by the continued rain, hay or even straw should be allowed; but it is far more safe to go farther, and remove the cattle, if not to shelter, at least to the driest situation which can be attained, cut grass with dry fodder being carried to them. Malt combs are very good in this intent, especially in the winter, in which season I should deem it absolute distraction to suffer cattle to wander abroad starving and rotting in deluges of water, and in alternate frost and thaw, did I not see many sober-minded persons voluntarily and purposely practise it.

Grazing too often fails, or is attended with inadequate profit, from the defect of an eligible and a provident system in the commencement.

This has respect to *the question of breeding or purchasing; to size, age, breed, store-feeding or fattening, and whether the latter be performed quickly or otherwise; in winter or summer—to ample conveniences, and provision at critical seasons, with power of con-*

stant superintendence. It sometimes happens, that cattle are purchased at random, the summer feed is eaten, and the beasts begin to thrive; during winter they recede in proof, and in the pinching time of spring, are not worth the prime cost; they are sold half fat in the summer or autumn, or perhaps kept until the following summer. But fattening, and even store cattle, should ever be maintained in a progressive state of improvement, be the intended progress slow or quick; if they remain stationary, there is a loss of interest of money and of time; if they go backward, there is a positive loss of property, with the additional prospective disadvantage of injury to the animals, of delay, and of difficulty in regaining their former plight. Should this irregularity be repeated, it is probable, the far greater share of the expected profit of grazing, would be found, on a fair calculation, to be sunk. Duly apportioning the stock to the quantity of food, and regular feeding, are the life and soul of cattle keeping. Ofttimes you will see store-pigs running about a man's yard, which are, alternately, in high condition, and as thin as greyhounds; he ought to recollect, whenever he suffers them to lose flesh, he has thrown away the greater part of that provision which was the cause of their improvement.

Inclination, convenience, capital, markets considered, the grazier will determine whether to breed or purchase, or do both, by which he will be better enabled to decide on the merits of both. Improvement is a grand motive to breeding, and cattle bred upon the spot, will ever be quicker in proof, than those which have travelled. The great question is—in what mode will a given capital make the most profitable return?

Store feeding of bullocks and young cattle, seldom practised but in breeding districts, is perhaps, gene-

rally, a more certain, if not so profitable a method, as fattening. It is true, that rich pastures are almost always applied to finishing cattle, but there is a middling kind of land, upon which store feeding may be most advantageous, from the number kept being proportionally more considerable, than if it were intended to fatten them. Many persons, who are not very successful at finishing bullocks, might probably succeed better at putting young lean store cattle into good condition, by which, granting a skilful apprehension of the occasions of purchase and sale, two or three pounds per head may be, in reasonable time, securely made. Thus, however, the consideration of good manure is too much sacrificed.

Many farmers never fatten any cattle, but in the grass season, such as they have kept through the winter, at straw. It is neither the method to raise much good manure, nor to bring beef to the best market. Cattle thus fed are generally sold at the cheapest time of the year. The cultivators of arable farms are too apt to overlook the opportunity afforded them, to make beef from artificial grasses, and the winter cattle crops; erroneously supposing that marsh land, meadow or pasture, are absolutely necessary to grazing.

The time taken to fatten cattle is extremely various; it is an affair which has not been hitherto the subject of calculation. Some will take a year and half to fatten their bullocks, others will make them far better in five or six months. This does not relate to convenience or practicability, but to choice or custom merely. In my opinion, there can exist no doubt of the infinitely greater profit of quick feeding and quick return. Young growing stock out of question, lean bullocks, purchased at Michaelmas, may be well turned out fat in March and April, when they will

be generally acceptable at market. Stores then purchased will have the benefit of the grass season, after which, they may be made in the stall or yards, oxen of great size, for Christmas, or early spring market. All circumstances concurring, the most advantageous plan is to join store-feeding and fattening, selecting for the latter purpose, such beasts only, as afford indubitable indications of great proof, and disposing of the culls, in their store state. We are accustomed to say of rich land, that it is too valuable to breed upon; but supposing a farm of six or seven hundred acres of the richest land in England, within fifty miles of the metropolis, two or three hundred of which were marsh or feeding land; and supposing the annual help of a hundred acres of cattle crops, for winter use, I know not, in what mode, the food could be consumed to so much advantage, as by an adequate stock of cows for breeding and rearing. The best reputed breeds might be procured and proved by experiment, and after the fourth year the grazing account would be most flourishing. This system would also admit the auxiliary of pig breeding to great advantage. No cattle from poor-land districts could be intrinsically, or commercially, worth so much as these. The question of size and number here presents itself in another form: you may, by various economical modes of management, breed a superior number of small animals, or of inferior worth, but will this larger number of the inferior, equal, in weight or quality, the smaller number of the well bred? I have generally observed the contrary result.

There are two plans of grazing cows, much practised in certain parts of the country; wintering heifers in calf, called in-calvers, for the spring market, and fattening barren cows. A good profit may be made by the first, if the cows be well selected and well kept

upon the proper winter crops. They are sometimes purchased at a low price at the Michaelmas fairs, and sold in the spring with calves by their side at a considerable advance. I have so ill an opinion of fattening barreners, that had I any from the dairy, I would rather sell them lean, replacing them with good bullocks to put to keep. Old cows are great consumers, seldom reach high weights, and their beef, particularly in the case of a dull market, may be sold at a very low price. A very low store price, however, or other circumstances, may render it eligible to fatten them.

Animals arrived at their full age, at least full size, are well known to be the most proper speedily to take on fat, since nature is not then impeded by a double process. Young animals of great substance, and well formed, will likewise fatten to good profit; but they are generally best adapted to the gradual plan of grazing, which, as has been observed, is prolonged to eighteen months, or even two years. The grazier thus reaps the profit of their natural growth, or increase in stature. There is another species of increase, technically styled *growth*; it is the spread or extension of muscular flesh in full aged animals, of large bone and capacious frame, a faculty which barrel-shaped, and small-boned animals do not possess, or not in so great a degree, these increasing only in fat.

In the PURCHASE of cattle, an honest middle man, or salesman, can perhaps, generally, act more advantageously for a principal, than such person can for himself, the most precise directions being given. A buyer well qualified to judge, may find his account in making journeys to those counties in which the required species is bred; but if these counties should be very distant, much time must be consumed in such expeditions. A scheme of this kind might be profitably conducted, by a number of neighbouring gra-

ziers appointing one skilful person among them, to go annually, or as often as needful, into the breeding country, whether Scotland, Wales, or elsewhere, to select and purchase for the whole, or an agent resident in the country, worthy of confidence, might do the business, and send the cattle home. Prime beasts might be always thus obtained, and at a fair price for ready money, more especially in those breeding districts, where the jobbers are always accustomed to buy upon credit.

But there are few parts of England where we do not find cattle fairs, within a day's ride, in which most of the breeds in vogue are not to be found. The unpractised buyer should not trust himself here unattended, particularly if cows be his object, the jobbers in which never fail to show their commodity in the youngest and fairest light, and (I speak feelingly) are troubled in general, I believe, with as few scruples as any men living, no offence intended to the noble fraternity of horse-dealers. A cow's horns are well shaven, not surely by an obliteration of the rings, that you may be prevented from guessing at her age, but that she may look handsome. A cow that has no calf is often very kindly provided with one; and if she be vicious, or a kicker, good care is taken that she make no exhibition mal-a-propos: but it is a good old saying, *he who buys the devil must sell the devil*. Breed, shape, great show of milking, age, condition, are the objects of inspection. The feet of cows are sometimes much hurt by travel, and may require great care to prevent the foul. Some great milkers will have a poor and starved appearance; but if a cow look very thin and hollow, and scour much, for which, technically, the jobbers have adopted plain English; more especially if her hair part easily from her hide, she may prove an unlucky bargain.

Store cattle should not be too low in condition, or scouring, or hollow, and pinched in the flanks, or hidebound, with the hair staring, since they may be naturally unsound, and altogether unfit to go to keep, or much hurt by their journey and poor living, in which case they will recover slowly, and at considerable hazard. On the examination of these by the touch or handling, Mr. Culley has written so curiously, at the same time with so useful an accuracy, that I shall make free to borrow the whole passage, being always ready to avail myself of the ideas of one who is so thoroughly a master of his subject. Should the reader discover a little professional refinement in Mr. Culley's sentiments, let it be attributed to that laudable zeal, without which a man will not succeed critically in any science.—“ We undoubtedly first judge by the sight, which being pleased, we bring the sense of feeling to its assistance; and if this also approves, we then conclude that the animal suits our purpose, or is answerable to the idea we have formed of it. A nice or good judge of cattle or sheep, with a slight touch of the fingers upon the fatting points of the animal; viz. the hips, rumps, ribs, flank, breast, twist, shoulder-score, &c. will know immediately whether it will make fat or not, and in which part it will be the fattest.—I have often wished to convey in language that idea or sensation we acquire by the touch, or feel of our fingers, which enables us to form a judgment when we are handling an animal intended to be fattened, but I have as often found myself unequal to fulfil that wish. It is very easy to know where an animal is fattest, which is already made fat, because we can evidently feel a substance or quantity of fat upon all those parts which are denominated the fatting points; but the difficulty is, to explain how we know or distinguish animals in a lean state, which will make fat,

and which will not, or rather which will make fat in such and such points or parts, and not in others; when a person of judgment (*in practice*) can tell as it were instantaneously: I say *in practice*; because I believe that the best judges *out of practice* are not able to judge with precision, at least I am not. We say this beast *touches* nicely upon the ribs, hips, &c. because we find a mellow, pleasant feel on those parts: but we do not say soft; because there are some of this same sort of animals which have a soft loose handle, of which we do not approve, because though soft and loose, they have not that mellow feel above mentioned: for though they both handle loose and soft, yet we know that the one will make fat, and that the other will not; and in this lies the difficulty of the explanation; we clearly find a particular kindliness, or pleasantness, in the feel of the one much superior to the other, by which we immediately conclude that this will make fat and the other not so fat; and in this a person of judgment, and *in practice*, is very seldom mistaken. I shall only make one more remark, which is, that though the one animal will make remarkably fat, and the other will scarcely improve at all, with the same keeping; yet between these extremes are numberless gradations, which the complete judge can distinguish with wonderful precision."

By the "mellow, pleasant feel, but not soft," Mr. Culley no doubt intends to express elasticity and pliability in the hide and membrane, without a loose and flaccid softness, which indicate debility and *washiness*. These desired qualities, discoverable by the touch, are, in part, the result of a sound and perfect state of body; or respecting the hide, specific, and appertaining to the breed. Some beasts, however, in perfect health, have harsh and unyielding hides, and yet make good oxen, and others, which appear to handle very

advantageously, nevertheless do not succeed even with the best keep. I believe, in general, good form is of more consequence than pleasant handling, and I have often known them both fail; so often indeed, that there seems something in the affair beyond the mere exception to general rules. It was probably a quick sense of this frequently recurring difficulty and uncertainty, in forcing animals to take on fat, which impressed the late Mr. Bakewell with the idea, that every other ought to give place to such consideration, and that every point of form or quality ought to be sacrificed, which did not contribute to quick feeding, and promoting the increase of external fat. The unsuccessful grazing experiment of Mr. Macro, recorded in an early volume of the *Annals of Agriculture*, and indeed similar occasional instances in every grazier's practice, will serve to prove, that the business of making fat beef, even with the best materials, cannot be reduced to any thing like a certainty. I last year saw an instance, of half a dozen well-shaped north country steers, kept upwards of six months at corn, hay, &c. some turnips, without being made much more than half fat; on the other hand, I have often known cattle of such, or even inferior promise, made ripe in less time by a month. Mr. Culley's objection to very short legs may be grounded: probably animals so formed may be sluggish and slow feeders; but it will be observed such a defect rarely occurs, and from the predominance of its opposite, in the north particularly, a few bulls of such presumed defective form might be of infinite use as a cross. In my own idea, I always connect long legs, hollow flanks, and thin quarters, with poor proof; and yet to show that nature will have her exceptions, Devon cattle precisely of that form will often feed as quickly as others of the truest barrel shape; yet such Devons will surely

never attain that weight to which they might be fed if they stood upon shorter columns, and had a wider capacity of loin.

It is an old and common precaution, not to bring cattle from a rich to a poor soil, nor to stock the latter with a large breed, but rather with such as are the produce of lands of similar quality. It is further held to be of consequence, upon soils where the water is foul, or of a quality not altogether salubrious, to avoid the cattle bred in districts supplied with pure water. The idea seems rational, and is no doubt the result of experience; but I must own I have never witnessed any ill effects from the change of water, perhaps because I have never resided upon a boggy or fenny soil.

An established breed is generally preferable to mongrels, since their form is more correct, and the qualities for which they are particularly valued more certain, as having been propagated through many generations: for example, the union of quick feeding, both externally and internally, and fineness of the beef, in the Devons, and of quick feeding and high weight in the Herefords. It would be vain to look for an equality, in these respects, in any mongrels, age and store weight yet perfectly equal. We have observed, that in respect of high weights, the Teeswater short horns are superior to all, but they are too heavy a breed to render it desirable to drive them to any very considerable distance, since long drift must contribute to render them slow feeders. It is a curious question, which I submit to the Lincolnshire graziers, whether more beef would not be produced, in a given time, from twenty acres of their marsh land, stocked with Hereford, than with the best Teeswater cattle. It is probable, that as a general average, twenty Herefords would fatten on the same quantity

of food required by seventeen short-horned beasts. As to the ordinary cattle of Lincolnshire, on which I have before remarked, I can make no question, but that to exchange them for Herefords would be to add immensely to the grazing profits of that rich county. It has been said, that a difference similar to the above subsists between the Devons and Herefords, and that land may be stocked most numerously with the former; this granted, and a certain amendment made in the form of the Devons, which would probably enable them to extract a still greater portion of nutriment from a given quantity of food, and they would outweigh in beef per acre every other breed upon the island.

How the account of weight of beef per acre might stand between selected Devons and improved midland county long-horns, is yet matter of curious speculation, and well deserves to become the subject of accurate experimental fact. The trial of quality and flavour, in each kind of beef, might be submitted to a jury of London epicures, with the rational condition, that they should not leave off eating until they were unanimous in their verdict. In treating of the long-horned cattle, although I enlarged considerably, there is one point in which I did not sufficiently discriminate. There are old and new long-horns. In the north-western counties many of the original breed are to be found; probably there are districts into which the improved stock hath not yet made its way. In truth, the best long-horned dairy cows are either of the original breed, or with only a *dash* of new Leicester blood. In looking over, lately, a lot of long-horned oxen, apparently of the old breed; large, deep, flat, and bony, but falling off in the hinder quarters, doubts arose in my mind as to the ground of that opinion, which assigns the barrel shape to the original north-

western long-horns: at any rate, there need be no doubt, that Mr. Bakewell improved upon the idea, and produced the barrel form, in a much higher degree, in his new variety. With a sample of the old breed before my eyes, it occurred to me, that I may have been too hasty in controverting the position of Mr. Culley, namely, that the long are slower feeders than the short-horns.

The Scotch and Welsh cattle are in universal use, being grazed in considerable numbers, even in those English counties where breeding is most pursued. The best of them are doubtless equal to any feed, and the smallest peculiarly adapted to poor soils and winter exposure; but we daily see great numbers of the inferior cattle of those countries upon lands which would feed, at least, the seconds of our best breeds, surely to the great diminution of their grazing profit.

It is impossible to give any certain rules for STOCKING with cattle, since the quality and condition of soils must necessarily be so various; local custom, under the control of the grazier's own reason and experience, will best determine the matter. It is yet worth while to repeat, and we cannot do so without admiration, the accounts of what our best grazing grounds will do in fattening live stock. In Lincolnshire are grounds which will keep, *upon two acres, fourteen large sheep and one ox throughout the summer, and five sheep on two acres through the winter; or sixteen sheep on one acre during the summer.* Other accounts say, an acre will carry a large bullock and six or seven Lincoln sheep, and that fifteen acres have fattened fifteen bullocks of their own large breed, and one hundred and ten of their sheep: the bullocks put from straw yard to the spring grass, and fattened to the size of eighty stones, of fourteen pounds, by the following Michaelmas. Rich as are the grazing grounds of Somerset

and Devon, I have not heard any report equal to the above in those counties. In the vicinity of Middleham in Yorkshire, I am informed, their best grazing lands, worth at this time from two to three pounds per acre, are summer stocked at the rate of a bullock and a quarter per acre, or five sheep. I have been over some marsh land of late, where, with two or three hundred acres of grass, they seldom keep more than one hundred small beasts, and a few score of sheep. On the island of Foulness, coast of Essex, two acres and half of marsh land, it seems, are required to fatten, in the six best months, a bullock of ninety stones of eight pounds.

IN HOME-FEEDING, whether during summer or winter, should the number of cattle be small, a well fenced yard will be very sufficient, and the cattle by daily walking about will retain the use of their limbs, and travel unhurt, and with less waste, to market. It may be often proper to tie them up whilst feeding; for neat cattle are remarkable for the spirit of monopoly, and the strongest are eager, not only to forestall the best of the provender, but even the whole of it, if in their power.

There is a particular and very important light, in which home feeding of cattle of any description may be viewed, but which is too generally overlooked or neglected: they may be most advantageously kept, for *their dung only*, surely a far better method than expensive purchase, and perhaps long and tedious carriage. Upon this plan, your cattle, if they simply bring you prime cost, being charged at the market price for all they have eaten, are your corn and hay merchants, allow you the fair profit on your corn and hay, beside generously making you a present of the manure. Surely this is well worth while, where manure may be of such vast consequence; and thus, and no better, it may happen in cheap times: yet even

under that disadvantage, a thorough knowledge of the stock to be purchased, and of its proper management, together with a skill in market revolutions, will oftener secure a small profit per head: in times similar to the late and present, manure making, far from being only at par, gives a high premium in the profit per head to be made upon the cattle, after they have allowed a market price for the produce they have eaten.

OX-HOUSES, for feeding cattle in stalls, ought to be provided upon every considerable farm, in defect of which, an incoming tenant ought, in justice to the land, as well as himself, to stipulate for such a provision. The erection for this purpose at Hafod, in Wales, the residence of Thomas Johnes, Esq. M. P. for the county of Cardigan, and one of the most eminent improvers of the present time, seem to be calculated upon a moderate scale. The whole length of the building is fifty feet, the roof shelving; its chief height being fourteen feet; the lower extremities, one seven and a half, the other six feet. A stone wall, running up to the summit, parts the feeding house from the other and smaller apartment, which is a receptacle for dung. Width of the feeding house nineteen feet within side. Stalls, each twelve feet long, by four feet two inches wide. Gangway three feet and a half at the heads and tails of the cattle, leading from the doors, the first door being for the cattle, the other for the attendants. Similar doors at the opposite ends of the building. Running water in troughs; racks and mangers. The cattle lie on wooden platforms, perforated for the passage of the urine. The urine runs, and the dung is pushed through apertures in the wall, each of which is two feet square, and one between every two stalls. There are twelve wooden flaps, or windows, to give light and air to each stall. The dung pit is about twelve feet wide,

sunk some feet deep in the earth, extending the whole length of the building. The walls are built partly with stone, and in part with wood; the roof with larch wood, as an experiment of its durability in that exposure.

The rotunda, or quadrangular form, might perhaps either of them be more economical of space and materials for a building to contain a considerable number. The oxen would most conveniently stand around, with their tails towards the wall, contrary to the usual practice, for the more easy throwing out the dung from a gangway, through apertures purposely made in the wall, into a pit, under cover, sunk around the building. The area within would, of course, be for feeding, and every necessary purpose of attendance. A store chamber above completes the building, the chief objection to the form of which, is the greater expence attendant upon the reversed position of the cattle, which perhaps is compensated by the great saving of labour, in the more easily getting rid of the dung. The gangway next the wall will, in course, be sufficiently wide to admit the beasts to and from their stalls: the dung apertures in the wall may be closed in cold weather.

Full-aged cattle are, doubtless, best calculated for the stall, and it has hitherto been a general opinion that full-sized ones are so likewise; but I cannot distinctly perceive, that the mode of feeding, and whether abroad or in hand, makes any kind of difference in the question of size. It is, doubtless, most promising to put cattle up to feeding which are already in good condition, although I have seen many put up bone lean, and yet turned out fat from the stalls in a reasonable time.

REGULARITY OF FEEDING is of the utmost consequence, indeed of more than any unpractised person

can possibly conceive. Three times a day, precisely at the commencement of a certain hour, ought to be the regular observance, and cattle, particularly if corn fed, require their fill of water. The easy, contented, and improving disposition of the cattle, and small waste of provender, attendant upon this regularity, is a source of constant satisfaction to a superintending proprietor.

The golden rule respecting QUANTITY is, as much as a beast can eat with a vigorous appetite; all beyond that important criterion, is so much lost to the proprietor, and not improbably an impediment to thrift in the animal. Here is the foundation of a good argument for the removal of that which the animal leaves, that it may not remain to be contaminated by his breath, to disgust him, and pall his appetite. I will fairly acknowledge, however, that I have frequently seen these apparently rational theories fail in practice, and the perpetually stuffed and glutted animal improving and improved beyond all others. Precautions are necessary, that a sufficient quantity of food, of the original standard goodness to carry the stock through, be provided, or procurable; for I would advise no feeder to trust to a certain vague notion, that fattening cattle may be safely and advantageously reduced from rich to indifferent, or even poor keeping. Frequently any change is disadvantageous; but if any, it surely ought to be progressive in goodness of the food. There is often, perhaps generally, a considerable saving in the provision, as the animals advance in fatness; but this relates to those chiefly who load themselves with internal fat. Some will devour nearly the same rations from first to last.

Cattle licking or rubbing themselves has been formerly held a bad sign; on the contrary, there can be no doubt of its being an incontestable proof of their

thriving: the former notion seems to have arisen from the damage they sometimes receive, by the quantity of hair and dirt collected by the tongue from their hides, and which may form hair-balls in the stomach, of dangerous consequence. Hence the use of currying oxen, which are confined from going into the cold air, of keeping them perfectly clean, and their hides open, like those of horses in condition. Oxen fed in the yard, and cows, may be wiped clean, without danger of taking cold.

The presumed necessity of BLEEDING animals, in order to dispose them to improvement, or to the prevention of disease, is now universally exploded; indeed, venesection was formerly used, both with horses and horned cattle, in the most wanton and useless way, and in cases wherein it would have been scarcely more ludicrous to have drawn their teeth; but these ideas by no means militate against the use of the lancet when it is clearly indicated. The indications are great heat of breath and hide, inflamed eyes, tumours, warbles (or, in the vulgar tongue of my country, *heat-bumps*) upon the back and loins, with much rubbing. Bleed two or three times, at a fortnight's interval; and even continue the practice throughout, should the same symptoms recur. In this case, the process of sanguification, or blood-making, encouraged by plenty of rich food, advances too fast, and may be checked with great advantage to the animal's proof. Such as are not endowed with a power of digestion commensurate with their appetite will become internally loaded, and the consequent obstruction will be found a considerable bar to improvement. Laxatives to clear the intestines, in this case, are highly necessary; and the most convenient are warm mashies of bran or pollard, in which may be mixed sulphur or common salt, to be repeated according to the occasion.

I think fattening animals ought ever to lie upon STRAW, in the country at least, where it can be cheaply procured; ease, warmth, and comfort must be highly contributory to their well doing, and straw, in these respects, will do far more beneath their feet than within their bodies, where it can only serve to reduce the goodness and efficacy of rich food. The case is different with store cattle, of which more may certainly be kept, by using all the straw upon a farm as food. The cattle, however, may, at certain times, be deteriorated in quality by bad lodging; and, for my own part, I have an insuperable aversion to seeing animals lying about in a comfortless state, and would always reject the prospect of any pitiful advantages derived from such a source. It is the good custom of the present times to cut fodder into chaff for the cattle, that is to say, to give neither hay nor straw uncut, the food going much further in its divided state, and the animals probably gaining more nutriment from a given quantity. Engines for this purpose are well known to be sold by the various agricultural implement makers. Much cookery is used upon the continent in feeding cattle; but I am not aware of great benefit to be derived from its application to any other articles of food, excepting potatoes, which are advantageously boiled, or baked upon a kiln.

It remains to speak particularly of the various articles of cattle food, in use for the stall. OIL-CAKE is said to stand in the first place for speedy fattening; I speak from general report, having never tried it. It is a very expensive article, and I have elsewhere recommended the substitute of linseed grown upon the farm, which might be boiled for use, and mixed with hay, chaff, or meal of any kind. The method of giving the oil-cake, is to pound it small. These fat and oleous articles make a vast quantity of the richest

manure, a great consideration, when the expence of cake may be very high, from length of carriage perhaps, and beef cheap. It is said that cake-fed animals, bullocks or sheep, (for the article is improper for swine) render as much per stone, or pound, at market, as those fattened upon the purest food, notwithstanding that the salesmen and butchers can discover in the living animal from a looseness in the flesh, that it has been fattened with this kind of food: no great compliment this, in my opinion, to the taste or discrimination of John Bull. The fat of oil-fed animals has an unnatural, and to me offensive, whiteness; after cookery, particularly as it becomes cool, it is never firm, but loose and greasy in the dish, smearing the knives like tallow: the gravy or juices of the meat are disagreeably luscious and oily, and the flesh itself has sometimes, according to my taste, or imagination perhaps, the flavour of fennel. Oil-cake is most tolerable in beef; but such meat must be extremely insalubrious to scorbutic and gross habits of body. An old author recommends linseed oil and bran, as the quickest feeding for a beast; and even asserts, that "five gallons of oil will fatten a beast sooner, and more effectually, than five pounds expended in any other food whatever." I have no doubt but it would scour the animals sufficiently to make plenty of dung. The oil mixed with meal might have a quickening effect.

Nothing is superior, perhaps equal, to GRASS, in fattening the graminivorous animals, whether for quickness, or the excellence, flavour, and firmness of the meat. Good hay in winter, according to the practice of Sussex and the west of England, will fatten a beast without other aid; but the succulence of cabbage, turnips, or their like, is doubtless an important addition, too much neglected in districts where they boast the superior fattening quality of their hay: but

upon those which are not prime feeding lands, that is to say, far the greater part upon this island, hay is insufficient by itself, as are the turnips, and even cabbages of poor soils, unassisted by more substantial food. The hardness and defect of juices complained of, in the beef of several breeds, otherwise in very high estimation, result probably from hay feeding.

CORN, it is plain enough, cannot be used in the fattening of bullocks and sheep, except in seasons of superabundant plenty, when it is highly eligible to expend it for that purpose. The plan saves carriage of corn to market, and may have a good effect upon loaded markets. Corn makes manure double the worth of the common, extremely heavy proof in the animals, and meat of the first quality and price; it also preserves the stock in the highest condition of health, in rigorous, or wet and uncomfortable winters. Wheat in course, from its cost, must be generally excluded; but it is, past all doubt, the most nutritious, fattens the quickest, and produces the finest flesh. RYE had formerly a great name for fattening oxen, of which I cannot speak from practice, having never used it but with hogs, and with those I thought disadvantageously, compared with other corn. In rye-feeding oxen, I should suppose a mixture of half peas would be advantageous. BARLEY and OATS stand nearly upon a level; the former supposed equal to beans at the same price, although the latter are, at least, one third heavier; the superiority consists in more speedy feeding, and more valuable flesh. PEAS prove best mixed with oats or barley, tending to consolidate and render the flesh firm; but used alone, they might probably make it tough and dry. BEANS rank last, and are beneficial to no animals whatever, excepting in small quantities; as a fattening food, they produce hard, dry, and ill-flavoured flesh, yet they are more commonly given to

oxen I think than any other corn. It is almost needless to remark, that corn is always ground for cattle, and should be mixed with the chaff of hay. Seldom is more than a peck or two of meal, a day, allowed to a beast in this country, the remainder being made up with hay; but in French feeding, our travellers talk of an ox eating twenty-two pounds of rye, three times a day; with such an allowance, they surely had need do their business quickly. Where the mill is at considerable distance, soaked, or malted corn, will succeed; the consequent acidity, if not too strong, forms no objection, and the intermixture of chaff will promote the mastication, or breaking down of the corn, by the beast. Some persons give corn in the straw, thereby saving both thrashing and grinding, cutting it from the stack: this may succeed, where the attendants are careful to give it in small quantities, that it may not be wasted, and to turn the refuse over to other cattle for examination. DISTILLERS WASH and Brewers grains, molasses wash, &c. feed quickly, and make loose and luscious meat, whether beef or bacon. Bullocks will eat from half a bushel, to a bushel of grains, per day.

CARROTS, POTATOES, PARSNIPS, and MANGEL-WURZEL, or the ROOT OF SCARCITY, are next in goodness to corn. The latter, one must suppose, of a very fattening quality, from the abundance of its saccharine juices, and from the vast substance of its leaves, the gathering of which, however, to the extent it was at first proposed, I am convinced must weaken the plants, and decrease the quantity of roots. From eating of this root raw, I have perceived, during two or three days continuance, a strange sensation upon the palate and throat, as from excoriation, but have never heard of any such effect on animals fed with it. I have given the leaves to poultry, rabbits, and pigs; the roots I understand may be preserved through the winter. Sir Mordant

Marten, of Norfolk, continues, I believe, our greatest cultivator of Mangel-wurzel, and is, in course, our best authority for its uses and worth: no doubt but the honourable Baronet will satisfy cultivators desirous of information on this head. Too much cannot be said in favour of carrots and hay, for fattening oxen or sheep; yet parsnips are said to be superior, and more nutritious than carrots; they are, besides, less difficult in point of soil, and hardy enough to stand the winter, it being the usage to sow them in autumn. Their use has increased considerably of late, and it seems they are well calculated for milch cows, in winter, making plenty of milk and well-flavoured butter. In Normandy, Guernsey, and Jersey, they are constantly used as food for all sorts of cattle, but I am informed, the pork fed on them has a strong and disagreeable flavour. Potatoes baked, or steam-boiled, are a most excellent article for any animals: in what degree the cooked are superior to the roots in their raw state, has not yet been ascertained, but that these last joined with good hay, will fatten bullocks and sheep, is out of all doubt. Bullocks in a fair store state, have, in scores of instances, been put up to raw potatoes, in October, and sent fat to Smithfield in March and April, two as favourable months as any in the twelve, for the sale of beef: nor have I known better crops of wheat than after both potatoes and turnips (the latter drawn in time) when plenty of manure has been allowed to the fallow crops. A middle sized ox will consume a bushel of potatoes, and ten, twenty, thirty pounds and upwards, of hay, in twenty-four hours. Some will refuse this root (raw) at first, but all may be brought to it by degrees. Should the beasts scour with raw potatoes, no uncommon case, the remedy consists in enlarging the quantity of hay, and in the last resort, an allowance of pea or bean meal, but

the inordinate looseness generally ceases after a while, and as the animal's stomach becomes accustomed to the food. Three great oxen have been fattened upon an acre of potatoes. Successions of RAPE, upon sound dry land, where the plants would stand secure (for on poaching soils, rape sometimes falls down into dung before Christmas) would probably produce ample and rich food for bullocks and sheep, throughout the winter season. Rape may be prepared in a seed bed, and the plants set out in rows, in April, according to the rules of the cabbage culture, and in autumn they will reach a vast size, frequently superior to that of cabbages: a succession may be set out early in July, for the use of the latter part of the spring; the crop to be cut and carried home.

CABBAGES, of which the large Scotch seems to have the preference, would indeed excel, in point of quantity, and tonnage per acre, provided we could secure them from the effects of frost, which will in some unfavourable seasons (frequent alternacy of frost and thaw) deprive us of half the weight, and nearly all that is good in the quality of the remaining half. In a favourable season, I have heard of more than forty tons of cabbage per acre, but must acknowledge, I have never been fortunate enough to grow such magnificent crops. Cabbage and oat, or pea straw, is excellent winter food for store cattle; with good hay, it fattens bullocks in five months, making perhaps a greater quantity of manure than any of the articles yet mentioned, and that plentifully saturated with the urinous salts. These (store-feeding and fattening bullocks and sheep) are the only applications, from which I can say any thing in favour of this head of the *brassica* tribe; but as to these, what I have experienced, authorizes me to speak with decisive approbation. I shall not however venture to enter the lists, in favour of cabbages, with a certain gentleman, whom Mr. Young

formerly visited, and who assured Mr. Young, that “for the grazier, another circumstance of consequence is, that cabbages have a remarkable effect in laying on the fat on the graziers points.” (An. Ag. vol. iv. p. 177.) Doubtless Mr. Young smiled, whilst he penned this extraordinary discovery. We have often heard of elective purgation, but never before, I think, of elective pinguefaction.

TURNIPS owe their universal celebrity and use, to their easy, unexpensive culture, and adaptation to poor light soils, which will perhaps bear no other cattle crop; for as food, they are weak and watery, more particularly upon poor land; an effect, which is in an equal degree produced by the same cause upon cabbages, and all our cattle crops, probably corn itself. I have seen Northumberland beasts, of the first size, fattened in Essex, upon turnips alone, and a mare with them; and I recollect, many years since, seeing in that county, a single root which weighed twenty-eight pounds, the crop generally running to a vast size; whereas, near Basingstoke, in Hampshire, I observed that small homebred bullocks stalled upon turnips and hay, could not be finished without the assistance of barley-meal.

I know not whether I have made the complete tour of the cattle-crops, but I believe, there is no soil, or situation, proper for cattle, upon which some of these articles of provision quoted may not be grown. It may be necessary to say a word or two, respecting quantities consumed by cattle, and on the requisite extent of provision for a given stock, on which latter topic however, the most useful rule to be observed, is *to be sure to have enough*, since a surplus of that kind, in the spring, never fails to be an article of ready sale, in almost any part of the country. In WINTER-FEEDING, provide an acre of turnips to fatten a bullock; or four large, or seven small sheep. Four acres of cabbage have often fattened seven large oxen, or one and three

quarters per acre, in five and six months; and sheep in the above ratio. Parsnips, root of scarcity, carrots, potatoes will do considerably greater things, the truth of which had infinitely better be essayed by the farming reader, than taken upon trust: of the three first of these articles, a middling ox will eat a bushel, or upwards, in twenty-four hours, with from ten to twenty pounds of hay.

In No. 229, *Annals of Agriculture*, we have an account of the daily consumption of food by various prize oxen. Hereafter follow the maximum and minimum of the daily quantities consumed by each beast:

		lb.	lb.	lb.
	Large Hereford ox Ball	77	turnips, 60	hay, 5 oil cakes.
Duke, of Bedford.	Do.	50	..... 42	..... 4 do.
	Do. Boxer	70	..... 48	..... 5 max.
	do.	56	..... 73	..... 5 do.
	do.	40	..... 21	..... 4 do.
	Do. Poppet	52	..... 52	..... 5 do.
	Large Heref. ox Poppet	40	..... 70	..... 5 max.
Duke of Bedford.	do.	40	..... 57	..... 6 do.
	do.	20	..... 27	..... 5 do.
	French ox (100 stone)	80	..... 56	no cake.
	do.	70	..... 64	do.
	do.	60	..... 50	do.
Small Devon cow	.....	74	..... 49	do.
	do.	60	..... 72	do.
	do.	50	..... 42	do.
	do.	60	..... 34	do.
Mr. Westcar's large Hereford	ox	24	..... 19	..... 7 cakes.
	do.	17	..... 18	..... 8 do.
	do.	2	..... 16	..... 10 do.
Do.....grass fed ox		108	Tank.do.	20½ no cake.
		94	Rutab.	19½ do.

The reader will note two material facts in the above account: the small quantity of roots eaten, when the quantity of oil-cake was considerable, and that Swedish turnip goes further, by about one in seven, than the English. Many farmers have pretended to me (indolently I suspect) that their stock will not eat Swe-

dish turnips: a thing quite opposite to my experience. I have often seen sheep following their keeper to eat rutabaga from his hand: there is another species of stock rather too fond of this article, namely, hares and rabbits.

In summer STALL-FEEDING upon NATURAL GRASS, CLOVER, TARES, SAINFOIN, GREEN CORN, or LUCERN, which last is superior to all in quantity, will best endure drought, and may be cut the oftenest, the practice of the first year or two, necessarily at some risk, will render the grazier expert as to the quantities, in proportion to any given stock and the regulation of his successions. No positive rule on this head, can have a general application. I have been in the habit of feeding a mixed stock, in this way, unaccountably neglecting to take memorandums of the precise result, satisfied at the instant, at its being so strikingly advantageous. Mr. Young's Annals must make amends for my defect. In vol. i. p. 91, of that collection, the late Mr. Baker, in Ireland, assures the public, that with the product of thirteen plantation acres, which make somewhat upwards of twenty English statute acres, in broad clover, cut and carried, he maintained in the house and yards, from May 24, and June 6, to Michaelmas, the following stock, besides the reserve of a certain surplus for seed and hay:—viz.

- 83 young and small store pigs,
- 3 milch cows,
- 4 three year old bullocks,
- 6 three year old heifers,
- 7 two year old bullocks,
- 3 two year old heifers,
- 11 yearling calves,
- 9 horses—or 38 head of horned cattle, 9 horses, and 83 pigs.

The soil, at the same time, described as mixed with large stones, of irregular surface, and full of hollows. Towards the end of August, when the clover became too short for the scythe, the pigs had another resource. Mr. Baker, at the time of writing this account, had pursued the practice during several years, with the utmost profit and satisfaction to himself. I wish he had taken an exact account, in bushels, of the quantity of manure resulting from the above experiment.

Mr. Mure's experiment of feeding on green winter TARES, given in cribs, in the farm yard, from June 6 to July 30, (p. 129, same vol.) is entitled to the most serious attention of the grazier, and indeed holds out a vast prospect of economy to the public. Half an acre of tares per day, served plentifully, without waste, eighty one Scotch beasts, which were put to spring grass from the straw yard, until the tares were ready. Here we perceive the want of some article to cut still earlier than the tares, for which purpose, lucern is the most proper, where it can be grown. Mr. Mure very justly remarks, "If bullocks are turned to graze as soon as the grass rises in the spring, they keep the ground so bare, that if a hot season ensues, it is burnt up, and the farmer finds either a necessity of turning them to hay, a second time, or his beasts suffer for want of plenty." Where lucern cannot be had, other attainable articles should be forced, as early as possible, by high manuring, cleaning, and every conducive method, in order to supersede the necessity of turning out at all. It is added, that a beast of fifty stone, from the result of these experiments in which the bullocks were weighed alive and dead, acquires in weight, *one stone* per month, on straw in the winter—by the first grass in the spring, *two and a half stones*, in something less than a month—by the summer grass, *three stones per month*, and by soiling on tares, *five stones in seven*

weeks, which is above four stones per month. Mr. Mure proceeded to winter feed with chaff and turnips, finishing with pea meal; supposing the chaff made of either straw or hay, it is not easy to quote more advantageous articles for the purpose, or more generally easy of attainment, since bean, rye, oat or barley meal, may be substituted. Many may wonder at my placing so much stress on things, supposed common, and known to all: but how often, when to the occupier of poor land, I have recommended to feed a few bullocks in the yard, in order to enlarge the dung heap, has it been retorted upon me,—“What, in the name of God, would you have us feed bullocks, or any thing else, upon, that have got no pasture land, and it is so far to fetch cake, and so dear, that they who try it, always lose deal at it?” Yet such men will complain, that barley fetches them nothing, when beef and bacon are ready sale, at a high price.

There are proper machine-knives for slicing the larger roots; potatoes are given whole. In case of a beast being choked by a root, instant application should be made with the flexible tube sold by M'Dougale, or, in want of that, with a stiff rope. There is considerable danger in the night, with roots of a certain size, since a beast may choke himself, and be suffocated, before the accident can be known; a possibility which renders it desirable that roots be given whilst attendants are at hand, and food of a different description left by night. Any animals put up to fatten, which are unquiet and scour, would probably be benefited by occasional drinks of beer, in which might be infused a decoction of poppy heads, or a small quantity of opium.

It is extremely imprudent, indolently to continue at high keep, animals which do not thrive; I advert chiefly to unthrifty individuals, with which the first

loss is always the least. There are machines for weighing them alive, instruments probably, rather of curiosity than of solid use, since on the point of well-doing, the practical eye is nearly infallible: time and weight determine every thing, as well here, as upon the turf.

The SALE of fat oxen, particularly of quantities, is more usually made, by sending them to market, perhaps to London, from a great distance; the waste in weight must be considerable, more especially in the case of bad travelling or lameness, and the risk of markets is great. These are arguments for sale at home, wherever practicable, and it is perhaps generally so with a few. In this case, there is a rule not to be forgotten in the sale of any kind of stock, pending the bargain, namely, to ascertain in what time the lot is to be drawn, that the feeder may not give away his keep. Some may make it convenient to kill an average beast, in order to determine the weight of a lot; a thing doubtless more practicable with the smaller animals. In this respect, Mr. Renton, a Berwickshire farmer, has accommodated the public with his *Grazier's Ready Reckoner*, price half a crown, containing tables to determine by the admeasurement of the animal's body, the weight of an ox, sheep, or swine, from three, to one hundred and thirty stone, sinking the offal; with instructions for taking the measure. The plan may be useful to settle any casual difference between buyer and seller. Lord Somerville also (see his *Facts and Observations*, p. 114.) ever mindful of the interest and convenience of those who feed the people, has drawn up a table to equalize the amount between stones and scores, different districts reckoning by their peculiar or customary rate: in the south, and around the metropolis, by the stone of 8lb. in the north and east, by that of 14lb. in Scotland by 16lb.

and in the west chiefly by the score, or 20lb. also a table of prices, from $3\frac{1}{4}d.$ to $7d.$ per pound. I extract these for the use of my readers.

Table for the Equalization of different Weights.

Scores.	Stones, at 14 lb.		Stones, at 8 lb.		Scotch Stones, 16 lb.		Hundred, 112 lb.		
	<i>st. lb.</i>		<i>st. lb.</i>		<i>st. lb.</i>		<i>cwt. qrs. lb.</i>		
20 equal	28	8	50	0	25	0	3	2	8
25 ...	35	10	62	4	31	2	4	1	24
30 ...	42	12	75	0	37	4	5	1	12
35 ...	50	0	87	4	43	6	6	1	0
40 ...	57	2	100	0	50	0	7	0	16
45 ...	64	4	112	4	56	2	8	0	4
50 ...	71	6	125	0	62	4	8	3	20
55 ...	78	8	137	4	68	6	9	3	8
60 ...	85	10	150	0	75	0	10	2	24
65 ...	92	12	162	4	81	2	11	2	12
70 ...	100	0	175	0	87	4	12	2	0
75 ...	107	2	187	4	93	6	13	1	16
80 ...	114	4	200	0	100	0	14	1	4

TABLE OF PRICES.

Scores at	3½d.	3½d.	3½d.	4d.	4½d.	4½d.	5d.	5½d.	5½d.	6d.	6½d.	6½d.	7d.	Difference.
1	0 5 5	0 5 10	0 6 5	0 6 8	0 7 1	0 7 6	0 7 11	0 8 4	0 8 9	0 9 7	0 10 0	0 10 5	0 11 3	0 0 5
2	0 10 10	0 11 8	0 12 6	0 13 4	0 14 2	0 15 0	0 15 10	0 16 8	0 17 6	0 18 4	0 19 2	0 20 1	0 21 0	0 0 10
3	0 16 3	0 17 6	0 18 9	1 0 0	1 1 3	1 2 6	1 3 9	1 5 0	1 6 3	1 7 6	1 8 9	1 10 0	1 11 3	0 1 3
4	1 1 8	1 3 4	1 5 0	1 6 8	1 8 4	1 10 0	1 11 8	1 13 4	1 15 0	1 16 8	1 18 4	2 0 0	2 1 8	0 1 8
5	1 7 1	1 9 2	1 11 3	1 13 4	1 15 5	1 17 6	1 19 7	2 1 8	2 3 9	2 5 10	2 7 11	2 10 0	2 12 1	0 2 1
20	5 8 4	5 16 8	6 5 0	6 13 4	7 1 8	7 10 0	7 18 4	8 6 8	8 15 0	9 3 4	9 11 8	10 0 0	10 8 4	0 8 4
25	6 15 5	7 5 10	7 16 3	8 6 8	9 1 9	9 7 6	10 12 6	11 18 4	12 24 2	13 30 0	14 35 8	15 41 6	16 47 4	0 6 0
30	8 2 6	8 15 0	9 7 6	10 10 0	11 13 4	12 16 8	13 20 2	14 23 6	15 27 0	16 30 4	17 33 8	18 37 2	19 40 6	0 3 2
35	9 9 7	10 4 5	10 18 9	11 13 4	12 17 8	13 22 2	14 26 6	15 31 0	16 35 4	17 39 8	18 44 2	19 48 6	20 53 0	0 4 4
40	10 16 8	11 13 4	12 10 0	13 6 8	14 3 4	15 0 0	15 16 8	16 13 4	17 10 0	18 6 8	19 3 4	20 0 0	20 6 8	0 6 8
45	12 3 9	13 2 6	14 1 3	15 0 0	15 18 9	16 17 6	17 16 3	18 15 0	19 13 7	20 12 4	21 11 1	22 9 8	23 8 5	0 7 7
50	13 10 14	14 11 11	15 12 6	16 13 4	17 14 1	18 15 0	19 15 9	20 16 8	21 17 7	22 18 6	23 19 5	24 20 4	25 21 3	0 8 8
55	14 17 11	16 0 10	17 3 9	18 6 8	19 9 7	20 12 6	21 15 5	22 18 4	23 21 3	24 24 2	25 27 1	26 30 0	27 32 9	0 9 9
60	16 5 0	17 10 0	18 15 0	19 20 0	20 25 0	21 30 0	22 35 0	23 40 0	24 45 0	25 50 0	26 55 0	27 60 0	28 65 0	0 10 0
65	17 12 1	18 19 2	19 26 3	20 33 4	21 40 5	22 47 6	23 54 7	24 61 8	25 68 9	26 76 0	27 83 1	28 90 2	29 97 3	0 11 1
70	18 19 2	20 8 3	21 17 4	22 26 5	23 35 6	24 44 7	25 53 8	26 62 9	27 72 0	28 81 1	29 90 2	30 99 3	31 108 4	0 12 2
75	20 6 3	21 17 4	22 28 5	23 39 6	24 50 7	25 61 8	26 72 9	27 84 0	28 95 1	29 106 2	30 117 3	31 128 4	32 139 5	0 13 3
80	21 13 4	23 6 5	25 0 6	26 13 7	28 26 8	30 40 0	31 53 1	33 66 2	35 79 3	37 92 4	39 105 5	41 118 6	43 131 7	0 14 4
85	23 0 5	24 15 10	26 11 3	28 26 8	30 42 3	32 57 8	34 73 3	36 88 8	38 104 3	40 119 8	42 135 3	44 150 8	46 166 3	0 15 5
90	24 7 6	26 5 0	28 2 3	30 19 8	32 37 3	34 54 8	36 72 3	38 89 8	40 107 3	42 124 8	44 142 3	46 159 8	48 177 3	0 16 6
95	25 14 7	27 14 5	29 13 9	31 33 1	33 51 3	35 69 5	37 87 7	39 105 9	41 124 1	43 142 3	45 160 5	47 178 7	49 196 9	0 17 7
100	27 1 8	29 3 4	31 5 0	33 6 8	35 24 5	37 43 1	39 61 7	41 80 3	43 98 9	45 117 5	47 136 1	49 154 7	51 173 3	0 18 8

Importunate as I have already been, for many years past with the public, in various treatises and detached essays, on the subject of OX-LABOUR, I might very well stand excused for a total silence here, with a mere reference to former labours : and this sentiment is farther strengthened, in that I have yet nowhere seen, in the multiplicity which has been written and published on the subject, a single valid objection, or one single argument deserving a serious answer. But there are yet some relative facts, and certain statements, on both sides the question, which, for opposite reasons, must have a place here. If the opponents of ox-labour could be induced to meet us on fair ground, by producing real facts, resulting from their own, or even the judicious experience of others, such conduct would be an immediate step towards general conviction : but, on their side, seldom are any facts adduced, or such only as might well be omitted, from their proving not at all to the purpose ; for example, the weakness or sluggishness of oxen, with which ought by all means to have been conjoined as correlative, and tantamount in point of consequence, their wearing long tails. To speak for myself, in truth enough for me, I never entertained the most remote idea of recommending the slow breeds of oxen, or any, in a weak state, or low fed, for labour ; and the seeing no other than such preposterous practice, in the early and middle part of my life, together with a most ardent hobbyhorse attachment, it was, that imbued me with the strong prejudice I then entertained, against oxen as beasts of labour. The chief opposition to the use of oxen now comes from the north, and a most curious circumstance it is, that, as with regard to the drill husbandry, and breeding fine-woolled sheep, the opponents and controvertists are generally those, who do not even pretend to have

ever had any practical experience of that, which they so boldly, loudly, and facetiously condemn.

The arguments in favour of horses are generally of the dictative and implicit, or of the witty and ludicrous species. Of the latter kind, much, and no doubt powerful, reasoning may be found, in our agricultural journals. Thus in a late, by no means illiberal, or ill-natured criticism on my Treatise on Horses (fair quarter which has been seldom shown to that wicked and eccentric work) I am happily ridiculed for preaching that, which I did not myself practise; and represented as shrewdly aiming to throw the risk and burden of the experiment on my client the reader. But even critics may be sometimes defective in circumspection, although it must be granted, that there can be no necessity for them to understand the subjects they criticise, for that would indeed be to prove too much. It seems not to have occurred to this critic, that circumstances opposite to my desire and conviction, might have interdicted the use of oxen, and as to the practical examples which I adduced, of other men, they unfortunately remained unnoticed, a mere dead letter.

But on this subject, the positive style has always been much in fashion, and perhaps on no other whatever, not even that of medicine, were the opinions more diverse and jarring. To begin with the positive, ‘a pair of horses will do the labour of four, six, or eight oxen, and reckoning the superior number of oxen maintained, will cost more in provision than horses; *ergo*, horses for labour are to be preferred to oxen.’ Again, ‘oxen being so slow in their pace, cannot come in any degree of competition with horses.’ Oxen it seems can be used only on particular and favourable soils, from which are excluded heavy clays and stony roads. Or if they make a poor

shift to plough, they are useless upon the highway, and want the docility as well as the agility of horses. And yet oxen labour on the wet and heavy clays of Sussex, and on the stony and hilly roads of Herefordshire; in the first being preferred as sticking more stoutly to their collars than horses, and in the latter county, beating them by an hour in the day, at road work, and being sufficiently docile to be driven to the greatest nicety through a gate way. It is averred, that in deep roads, and up hill, oxen are more to be depended upon than horses, and it is usual, upon the continent, for carriages which are set in bad roads, to be drawn out by oxen.

A respectable and veteran agriculturist, who reasons on some other topics more successfully, observes on the ox question, that ‘individual farmers are doubtless the best judges of what is most likely to turn to their own advantage;’ that “every attentive cultivator must be a better judge, than any theorist can be;” and that, “the single fact of horses being preferred, is a sufficient proof of their superiority.” It will be quite sufficient, to demand of this gentleman, whether the single fact of the universal preference, formerly shown by farmers to the old system of husbandry, is a satisfactory proof of its superiority to the new, since generally adopted? nor is it improbable, that these theorists, to whom he objects, that is to say, men who meditate, analyze, and discriminate, as well as practise, had some small share in the vast improvements of late years introduced.

In another place, I formerly gave an instance of a large farmer, who positively asserted, that oxen would by no means succeed for labour upon his farm. His reason, as I stated, was of the pure authoritative kind, requiring no useless and chargeable fuss of ex-

periment. His successor in the farm, however, is of an opinion so totally opposite, that having actually and experimentally tried oxen, a year or two, not only finds, that they equal horses on his own farm, but strongly recommends them upon every other in the land, as one of the greatest possible improvements in husbandry. I leave it to the logician above quoted, to settle the difference between the two.

The Edinburgh Farmer's Magazine, No. 15, a quarterly repository of useful and important agricultural information, which I cannot sufficiently commend, introduces under the signature of M. the objections of a real farmer, I believe, to ox labour. Let us attend to the arguments of our ingenious, and obviously well-meaning, Scottish brother.—He says, 292 u. s. “ I mean not to enter into any reasoning on this subject, but to show, not merely what can be, or ought to be done by a pair of horses, but what has actually been performed on my own farm, and under my own eye, in the course of last year, by a pair of horses. If I am not much mistaken, it will rather tend to bear out our farmers in their general preference to horses; while at the same time, I suppose some of them can produce a greater quantity of work performed by the same strength, and in the same time. As this subject has assumed the appearance of controversy, almost more than any other, and produced rather pointed language from some of your correspondents, I apprehend that such statements of facts, will go further towards settling this knotty point, than any other mode of discussing it. But to come to particulars. In the first place, my horses ploughed one hundred and eight Scotch acres, of strong clay soil, with all the harrowings and rollings: they carted about a thousand carts (single-horse carts, the way they are always worked) of earth, from one side of

an eight-acred field to the other: they brought earth from a distance of two miles, to fill, about half way up, three hundred yards of a drain, three feet deep, the same width at top, and a spade wide at bottom: led out eighty carts of dung to the adjoining field: brought home, thrashed out, and carried to market the produce of twenty-nine acres—a heavy crop: were a week employed carting stones for making up fences; besides bringing home the family coals, I suppose equal to another week; and doing all the other smaller jobs about a farm, not easily enumerated, but which are well known to be many. All these ploughings, harrowings, rollings, and cartings (except filling the earth and dung into the carts) were performed by one man. As I have mentioned the work my horses performed, it may be proper to say how they were treated. They are always fully nine hours in the yoke, when the season is far enough advanced to admit of it—five in the morning and four in the afternoon; when they get three feeds of oats, or what I have found far preferable, oats morning and mid-day, and raw potatoes at night—hay for fodder. During the short days, they have but one yoking of six hours; when they get two feeds of oats with straw for fodder. In summer, they have cut grass in the house, during the day, and are put on good pasture during the night. I believe being out all night makes them more hardy, and is of benefit to their health; but before turning them out, they are allowed to cool in the stable, and to be quite filled with cut grass. I have always found that two good horses well fed, and their work properly timed, will perform as much as almost any man is able for, and more than most of them will do. I should be glad to hear from some of your advocates for oxen, (and I would more particularly address myself to your correspondent in

your 7th No. p. 281.) *what number of his oxen, (as they appear to be of a superior kind) and what number of servants it would require, to perform the quantity of work stated above.* This might perhaps afford something like the Dr. and Cr. statement, although not precisely what the conductor, in his note to that correspondent, mentions. If your correspondent Mago receives from Alfred an answer to his first query, p. 54 of your last No. this may perhaps serve for making a comparative statement with his oxen; keeping in remembrance, that as I have a clay soil to manage, there were of course many days in the year when my horses could not work, as I never attempted to plough it wet. On ~~such~~ soils I believe *oxen totally inadmissible*; because, from wet weather, they are often thrown late, and in that case, whenever the weather favours, such extra exertion is necessary as they are quite unequal to."

I have made the above quotation pretty much at large, as it is evidently the production of a man of judgment, and touches the marrow of the question. But by way of answer, nothing further is necessary, than to attend to the inquiry which I have purposely placed in *italics*, and to which I reply—precisely the same number of animals and of servants which himself had used to perform the labour stated. It could only arise from this farmer never having witnessed (a very common case throughout Britain) the exertions of well-fed oxen of the true labouring species. I will pledge myself, without hesitation, that a pair of well-bred sound oxen, driven by a steady and experienced man, will, barring accidents, continue annually the quantum of labour above stated during three years, or from four or five to eight or twelve years of age; have in the interim sufficient respite from labour, and quit it at the conclusion in good and saleable condition. The rea-

son assigned for the inadmissibility of oxen on clays, respects only the common bred species, and such as are insufficiently fed. I should much doubt that the generality of Scotch plough horses equal in speed the best English draught oxen, at least we do not find such to be the case here.

A few words on this gentleman's mode of treating his horses, which generally deserves imitation; but I am curious to know his reason, when he decides that raw potatoes are preferable to corn by night for labouring horses, unless he apprehends the oats might prove too nutritious. Again, for animals which labour constantly, in the summer heat, some corn is certainly requisite, on grounds of the truest economy; nor is there any of that species of economy in feeding labouring beasts with straw. No ill consequences, it is granted, may be immediately apparent from these pitiful feeding shifts, because calculations are not made, nor the matter nicely investigated; but horses in particular, which have not been well fed during labour, lose their vigour and wax old very early; and a horse become weak and exhausted is a very heavy and expensive burden. What is said in this letter on the subject of driving the horses abreast when three are required, in cross-ploughing heavy land with deep furrows, is both rational and of much consequence. I have no doubt, but thus placed, three horses are equal in power to four in the common method of two leaders, from their close junction to the centre of draught, and their greater equality in drawing. A skilful driver with reins will drive three steady plough cattle as well as two, although I have seldom seen it practised: it is, I believe, most in use in Cambridgeshire.

From the acknowledged great experience of Messrs. Culley and Bailey, much dependence has been placed on the comparative statement of the labour and ex-

pense of horses and oxen, given in their Northumberland Survey; and doubtless many farmers, relying on such authority, have been thence discouraged from making trial of oxen. The total disagreement between this estimate and the former strong recommendation of oxen for labour by Mr. Culley, in his *Treatise on Live Stock*, has been much remarked, and in fact has strengthened the arguments in favour of horses, by the supposition, that Mr. Culley has been obviously and fully convinced by more mature and later experience. Mr. Culley in his book zealously recommends the general promotion of ox labour to the attention of the legislature, with the observation, that “oxen will do ploughing, leading dung, corn, &c. equally well as horses;” adding to p. 85 the following note—“The author and his brother, in partnership, at this time employ about one hundred and fifty oxen in the draught, which is mentioned here as a proof that they approve of drawing oxen in many cases, after more than thirty years experience; they use them in carts singly, and two in a plough, with cords, without a driver, where they go equally as well as two horses, though not quite so swift, and I am happy to add, that the working of oxen is becoming more general every day, as many of our neighbours are following this example.”

It will be fair to remark on the above quotations, that the author also spoke guardedly on his subject, giving the reader a caution, that he “would not be understood to think, as some people do, that oxen will answer as well as horses in every kind of farming work;” and observing, that oxen were slower than horses. Premising thus much, we may now safely contrast the above recommendation of oxen with Messrs. Culley and Bailey’s subsequent unfavourable report, in the following estimate; and all which will

appear, is, that they had in former time inadvertently employed an improper species of bullocks, whence they were burthened with such superfluous numbers, as to render even animals of the profitable and eatable class more expensive and less beneficial, on their calculation, than horses: in consequence they have adopted the latter.

A comparative Statement between Horses and Oxen, for the Purpose of the Draught, by Messrs. Bailey and Culley, in their Agricultural Survey of the County of Northumberland.

“ By way of preliminary, it will be necessary to admit, as data, that a horse which eats seventy bushels of oats per year *will not consume of other food so much as an ox that gets no corn*; but in the following estimate we shall allow horses to eat as much as oxen, as the difference is not yet sufficiently ascertained.

“ That the oxen are yoked at three years old, and worked till six; *and for the first year require eight to do the work of two horses*; but after having been worked a year, and become tractable and stronger, *six are equal to two horses*, either by being yoked three at a time, or two, and driven by the holder with cords; of course the expense of a driver may be estimated to be saved for one half the year.

“ That the expenses of a ploughman, the plough and other articles that are the same in both teams, need not be taken into the account.

“ And, *that oxen to work regularly through the year cannot work more than half a day at a time.*

EXPENSE OF AN OX PER ANNUM.

	£.	s.	d.
Summering—grass two acres, at 20s. per acre	2	0	0
Wintering—on straw and turnips, £2. But if on hay 4.			
The average	3	0	0
Interest at five per cent. on price of the ox	0	10	0
Harness, shoeing, &c.	0	15	0
	<hr/>	<hr/>	<hr/>
	6	5	0
Deduct for the increased value of an ox, for one year	1	0	0
	<hr/>	<hr/>	<hr/>
Gives the expense per annum of an ox for the team	5	5	0
	<hr/>	<hr/>	<hr/>
And the expense of six oxen	31	10	0
Expense of a driver half a year	3	10	0
	<hr/>	<hr/>	<hr/>
Total expenses of a team of six oxen	35	0	0
	<hr/>	<hr/>	<hr/>

AN EIGHT OX TEAM.

The expense of an ox per annum, being	5	5	0
			8
	<hr/>	<hr/>	<hr/>
That of eight will be	42	0	0
To which add the expense of a driver	8	0	0
	<hr/>	<hr/>	<hr/>
Give the expense per annum of an eight ox team	50	0	0
	<hr/>	<hr/>	<hr/>

	£.	s.	d.
Therefore the expense of a team of oxen			
the first year will be	50	0	0
Ditto the second year	35	0	0
the third year	35	0	0
	<hr/>		
Divided by 3)	120	0	0
	<hr/>		
Gives the average expense per annum of an			
ox team from three to six years old . . .	40	0	0
	<hr/>		

EXPENSE OF A HORSE PER ANNUM.

Summering—grass two acres, at 20s. per			
acre	2	0	0
Wintering—straw thirteen weeks, at 9d.			
per week	0	10	0
hay sixteen weeks, one ton			
and a half, at £ 2. per ton	3	0	0
Corn for a year, seventy bushels of oats, at			
2s. per bushel	7	0	0
Shoeing and harness	1	0	0
Annuity to pay off £ 25. in sixteen years,			
the purchase value of the horse at four			
years old	2	5	0
	<hr/>		
Expense of a horse per annum . . .	15	15	0
Ditto of a two horse team	31	10	0
	<hr/>		

If a three horse team be kept, the account will stand thus :

	£.	s.	d.
The expense of a horse per acre being . .	15	15	0
			3
	<hr/>		
That of three will be	47	5	0
To which add the expense of a driver . .	8	0	0
	<hr/>		
The expense of a three horse team .	55	5	0
	<hr/>		

“ If the comparison be made with the horse team of many of the midland counties, where they use five horses one before another, in one plough, the account will stand thus:

	£.	s.	d.
The expense of one horse per annum being	15	15	0
			5
<hr/>			
That of five will be	78	15	0
To which add the expense of a man to drive	18	0	0
<hr/>			
The expense of a team of five horses will be	96	15	0
Do. of three do.	55	5	0
Do. of two do.	31	10	0
Do. of eight oxen	50	0	0
The average expense of an ox team from three to six years old that will do the same quantity of work as two horses .	40	0	0

“ The conclusions to be drawn from the above statement are so obvious, as to need little elucidation. But we cannot help remarking, how strong the force of prejudice must be, to continue the use of five horses, and heavy, clumsy, unwieldy wheel ploughs, where a single swing plough, and two horses yoked double, and driven by the holder, would do the same quantity of work equally as well, and at one third of the expense:

“ But before any proper conclusion can be drawn whether ox teams or horses are the most eligible, it will be necessary to consider, whether the quantity of land employed in supporting these animals be used in the most profitable mode to the community as well as the occupier.

“ With the latter the first question for consideration is, *whether eight oxen used in the team, or in grazing, will pay him the most money.*

“ Suppose eight oxen, at three years old, were put to the plough, and plough six acres a week, which, at 3s. 4d. per acre, is 20s.; and if they work forty-eight weeks in a year, then their whole earnings (after deducting £6. for harness, shoeing, &c.) will be £42.; but if they plough only five acres per week (which is probably nearer the truth) then their whole earnings will be only £34.

“ The same oxen put to graze at the same money, should improve in value £5. 5s. each in the first case, and £4. 5s. in the latter; but we are inclined to believe there are few situations, if the cattle are of a good, quick-feeding kind, where they would not pay considerably more.

“ In respect to the community, the account will be nearly as follows :

From the above statements, we find that	
an ox for summering and wintering	
requires	3½ acres.
Therefore a six ox team will require . . .	21 do.
And two horses for grass and hay per annum require	7 do.
For corn and straw	4 do.
Land necessary for keeping two horses	
per annum	11 do.
The difference in the quantity of land required for a team of oxen more than	
horses	10 do.

“ Hence it appears, that a team of six oxen requires ten acres more land to maintain them than a team of two horses, which will do the same work, and *of course*

the produce which might be derived from these ten acres is lost to the community. Suppose it to be one half in grass, the other half in tillage, then we shall have—

5 acres of clover or grass,
 $1\frac{1}{2}$ do. of oats,
 $1\frac{1}{2}$ do. of turnips or fallow,
 $1\frac{1}{2}$ do. of wheat.

“ It would then send to market yearly, at the lowest computation,

$7\frac{1}{2}$ cwt. of beef
 8 quarters of oats, and
 5 do. of wheat.

“ From this view of the subject it appears, *that if oxen were universally used for the draught in the room of horses, there would be a considerable defalcation in the supply of the markets, both in corn and animal food.* And the loss to the farmer would be the profit derived from the produce ; which, by the usual mode of allowing one-third for the farmer's profits, would in this case be about £10.”

Did the foregoing extraordinary estimate proceed from the pens of closet ploughmen, of the manufacturers of Agricultural Dictionaries, and of Complete Farmer's Guides, it would be unanswerable, that is to say, would require no answer ; but the respectable authority, simply, whence this comes, entitles it to a serious investigation. Nor will the gentlemen, Messrs. Culley and Bailey, I am convinced, conceive the least umbrage at seeing their opinions controverted, from the thorough conviction which men of their judgment must feel of our general liability to error ; a truth of which they must, in this case, be forcibly reminded by

Mr. Culley's late error, in recommending so strongly a plan which he now with equal energy condemns.

The reader will remark, that I have called his attention to those passages, in which the chief sense of the argument is implicated, by putting them into *Italics*. Respecting the calculation generally, it is truly precise, and the various branches of it, unimportant however to the main design, are curious and sufficiently correct: but many a memoir have I read, upon subjects of still greater importance, in which the matter has been good, the arrangement clear, the arguments strictly logical, for logic will subserve indifferently either side of a question, and the language insinuating and elegant: there has however appeared, on a thorough investigation, one single defect, not indeed of much importance, generally speaking; the splendid superstructure has had no foundation.

To apply the above reasoning to the estimate in question, the *postulatum* of Messrs. Culley and Bailey is totally groundless, a mere assumption. *Neither eight, nor six oxen, are required, to do the labour of two horses.* This is proved by many years practice in Lord Somerville's farming establishment in the west, by Mr. Wakefield's practice in Essex, and by the practice of Herefordshire, Shropshire, and in fact of every district where it is made an object to use oxen for labour. If the Northumberland gentlemen gratuitously chose to employ such a number of oxen, or a species of cattle, from their natural slowness unfit for the purpose of draught, they can thence take nothing in favour of the hypothesis, or of the principle they meant to inculcate. In the mean time, it seems strange, that the labouring powers of the oxen of Devon, Hereford, and Sussex, of which Mr. Culley had, at least, heard so much, did not enter into his recollection.

The calculators take it for granted, "that oxen,

to work regularly through the year, cannot work more than half a day at a time." On the contrary, I know of no difference, in that respect, between the two: the ox, less expensively fed, will work hour for hour, with the horse, throughout the year, and throughout his course of years.

It would be to combat a shadow to controvert by argument the following general deduction, after having proved the postulate, on which it is grounded, to be erroneous. "If oxen were universally used for the draught, in the room of horses, there would be a considerable defalcation in the markets, both in corn and animal food." Granting the necessity, or choice of keeping such a superfluity of labouring oxen, no doubt, I think, ought to exist, that it must vastly increase, far from diminishing, the quantity of animal food sent to market; and if we are not allowed, to pronounce so positively, in respect to corn, I yet cannot help inclining to the opinion, that the same effect would, in the circumstances of this country, be produced in the quantity of corn also. It would encourage cattle breeding, the grand support of tillage. The cattle in yoke would be *all* an eatable stock, reserved on hand, and perhaps the worst effect would be so considerable a reduction of the price of beef, as to induce the necessity of an export trade. The generality of our farmers are by no means prone to the error of overstocking themselves with oxen. Land would be employed to more ultimate profit in store-feeding animals, which may be eaten as human food, and those at useful labour the while, than in keeping horses, which give but the same quantity of labour, and are in the end fit only to feed dogs. The profit on the land employed in feeding the oxen, is only protracted, not thrown away: and the advantage of ultimately fattening and consuming,

as provision, the whole of our labouring beasts, seems to have been totally overlooked, in the estimate of Messrs. Culley and Bailey, which is a distinct and additional profit to the annual pound, there allowed, for increasing store-value. On the other hand, it may be remarked, that the chief demerit of the common breeds of oxen, their slow pace, remains unnoticed in the estimate; in truth a most important defect in critical seasons, when dispatch is so urgently required.

According to the common opinion, oxen eat more hay than horses; but were both fed entirely upon hay, it is probable, the difference between each would not be considerable: it is no less generally believed, that the ox, full fed, with both hay and corn, would still cost less in keep than the horse. To this may be added, that in certain dear seasons for hay, many feeders of horses, of whom hard labour is required, have found it profitable to substitute, in as large a measure as possible, oats for hay. Being on the box, last year, of one of the Hampstead stages, I was most agreeably surprized to see a pair of *short* stage horses, near London, too generally revolting spectacles of misery, as round as dumplings, and as sleek as moles. My satisfaction was increased by the sound sense of the coachman, who assured me, that long experience had convinced him of the superior profit, as well as credit of good keep. He observed, that a pair of his horses would last through a course of years, and labour cheerfully every day, whilst a pair of the worn down and starved creatures, kept sometimes even by men who can afford to act more liberally, are whipped to death, perhaps in a few months. Hay being at an excessive price, he fed chiefly with oats.

In the Highland Transactions, we find the following remarks, in the shape of an objection to oxen for

labour: " Though many farmers in the highlands be solicitous to preserve or improve the breed of cattle, yet the great object of all is the number that can be brought to market. Now there is this remarkable difference between the horse and the ox; the horse, however lean, however much reduced, is easily recruited, and if he get but a handful of corn, before he is yoked, will endure moderate labour; whereas the ox, in that state, is good for nothing, he has neither strength nor spirit, and will lie down the moment he feels the draught, nor is it possible to recruit him, but by a summer's grass." To this, it may be replied, that few seem disposed to try the poor ox with a " handful of corn," although they never, but in the most extreme necessity, attempt to work a horse, in weak and low condition, without it; and whoever shall be hardy enough to labour the horse, on ox-fare, will find no reason to boast of the superiority of horses, which, at any rate, according to the evidence of common practice, seem to have a still greater need of invigorating diet than their rivals. I must own I have never yet seen oxen, which, although worked or starved, to the bone, would not proceed with the yoke, after a few days good keep. In this case certainly, the slow common bred ox must appear to vast disadvantage, in yoke, where his pace will equal that of the snail; convincing, no doubt, rationally, the lookers on, of the total inaptitude of oxen for labour.

But having made a very ample display of the demerits of the labouring ox, it is now time to turn to the other side of the question, that a full and fair statement of a case of much national and individual import, may be, according to the best information I possess, exposed to the view, and submitted to the judgment of the reader. And in this, and in every

other research, I pretend to be guided by truth and utility solely, and will, with heartfelt acknowledgment, thank the man who shall convict me of an error, for he will thereby forward the constant aim and purpose of my life; he will have increased my poor stock of knowledge. On the present subject surely, my impartiality ought not to be doubted; at least, if my Treatise on Horses may be cited, as a proof of the strongest possible attachment to that noble species of animals.

The change of opinion, on this subject, in Scotland, affords matter for reflection. In Wight's Husbandry, we are told, on the authority of Miss Frazer, that "six oxen do the work of six horses, and eat no more than three;" and that, "all the best cultivators in Scotland use oxen in harness." I cannot, however, vouch for the accuracy of an account, which describes an ox as doing the labour of a horse, and eating only half the provender. The Rev. Mr. Arthur, of Resolis, Cromarty, (County Reports) finds oxen equal to horses, *fully and fairly*; and he keeps good horses. In the same place, we are informed, that "a gentleman works eight large oxen in a plough, whatever the soil, strong or weak, fresh or fallow:" a fact, which I can readily credit, having often witnessed a similar absurdity, in an English district, where as good labouring oxen are bred, as we have in England, and to which no common plough horses are equal: nay, in the same county, the farmers often yoke ten oxen together, in one plough, and what is still more extraordinary, stand to it stiffly, as a measure of necessity, which I should by no means be disposed to controvert, were the exertions of the beasts, equal in stiffness and energy, to the prejudiced arguments of their masters: as in Hants and Berks, at their four and six dray-horse plough teams, upon light garden

mould, I have here stood with astonishment, to witness the wonderful efforts of strength and speed in eight oxen to a plough, the pace more than a whole mile per hour, and the weight to be drawn, upwards of a half hundred pounds each ox. An Essex or Norfolk ploughman, who had never seen, or heard of any other than the expeditious practice of his own district, might be naturally enough led to suppose this a may-game, or farce, in which the plough was burlesqued. An apology is usually made, to remarkers on this waste of time and strength, that the cattle are young steers, breaking to the yoke; but even so, it appears to me, an awkward and useless proceeding, and that these animals had far better feel a little real labour, however short its duration.

The following extract from a late letter of Lord Somerville to the conductor of the Farmer's Magazine, No. 15, will place the merits of oxen in the clearest light, that of actual proof and fact. After the mention of such authority, it is superfluous in me to add, that I have seen these ploughs at work, and although accustomed to the horse teams of Essex and Suffolk, I do not recollect to have ever before witnessed such expeditious ploughing.

“ On the great question of working oxen, I am desirous that we should also come to a right understanding; and I trust that, although my opinion may differ from yours, you will do me the justice to believe, that I advance nothing without proof, and that the best recommendation of these my ideas to your notice, is an honest desire to serve the common cause, and an incessant attention and practice for nineteen years past. The use of oxen, even under many impediments, has been persevered in for ages past, and will continue in every country, where a breed is found, active in themselves, and of a form and size well adapted to

labour; but now that oxen fit for grazing are hardly to be found, this becomes every day a question of greater importance, the supply of our navy particularly considered. We must not conceal from ourselves, that half grown, and therefore half-fat animals, will not take salt well; nor should we forget, that our seamen must have salt beef, and good in quality too, as well as salt pork; and on this account alone, labour, even to the amount of what these animals consume, is valuable, because experienced men know, that the growth of a working ox is greater the last year of his work, namely, from five to six, in cattle of moderate size, and from six to seven, in larger ones, than in any other period of their existence. We must take into consideration also, that they are subject to few casualties, and that they consume little, if any corn at all; which circumstance, by the way, puts almost out of the question, any fair competition between them and horses, even if the size and condition of flesh were nearly the same. Every man who travels post, knows the difference between the same horse kept at grass, and that well kept on hard meat, and the case exactly applies.

“On these grounds it is absolutely necessary that your readers should be undeceived, as to the comparative powers of the horse and the ox; the difference between which, even under circumstances adverse to the latter, will be less than they will readily conjecture. Two instances in point, have occurred within these two months past. My authority for the first I give; of the second, I was an eye witness. At the last meeting of the Dublin Society, there were many ploughs entered for the prizes given; and to the surprise of every one, the oxen beat the horses in speed. They were worked in pairs only, without drivers. These were not oxen selected from the most esteemed

breeds for labour, but the oxen of that country. Many of the ploughmen who contended for these prizes, were from the Lothians and Tweed side. This I learned from Mr. Rennell, whose knowledge and accuracy in matters of this sort, those who know him will vouch for.

“ At a meeting held the end of May last, at Burnham Wyck, in Essex, for three prizes given, more than twenty ploughs started, three of which were worked by pairs of oxen each, without drivers. The oxen were bred on the estate, and of a sort which are deemed by no means well adapted to labour. The horse ploughs were picked teams. The difference of time in finishing the work allotted was, to the best of my remembrance, about twelve or fourteen minutes (other accounts say five minutes) between the average of the horse and ox teams; so that suppose them to be an hour and half longer in their day's work, the difference in the time of rest will be, if any thing, in favour of the oxen; because animals which perspire by the tongue, need not that dressing and care, which those demand whose perspiration escapes by the skin.

“ I beg to be considered as no friend to new systems where essential benefit will not result; for we who practise husbandry, are too often the children of prejudice, and a change of system is always painful to effect. Where an acre of land or more per day, all descriptions of work considered, is ploughed by a pair of horses, there is no reason to complain; the proprietor might benefit something by the change; but as a question of public supply, it is most material to consider, that our labour may be done, and well done, by animals which, having attained their full growth, we eat, rather than by those, which, after the same period, become daily of less value, and eat us.

“ Reverting therefore to my first request, that in

labouring to promote the public interest, we ought to do it by means the most conciliating, I have to observe, that dictatorial opinions, unsupported by reason and proof, have no right to find their way into a work of this nature; nor can they long be found there, without injury to the work itself. One hundred years after the union of two kingdoms, we have no right to talk of separate interests; but if such a plea is to be urged, allow me to add, that I have an equal interest in the landed improvement of both; and rely on it, Sir, both the north and the south have something to learn from, and something to teach, each other. On these grounds it is, that I beg leave to say, should any experienced farmer have occasion to visit that part of the south, where my business lies, a letter from the publisher of your most excellent work will be his passport, and will secure to him the best hospitalities my house, such as it is, affords, that he may have leisure minutely to examine our practice, and that of the country in which we are placed: there are no other means by which professional questions, and those too of great importance, can be solved. In the mean time, if any of your readers are desirous to know what our rate of labour is, I will, in a few words, state it. We break in our oxen to labour at three years old: the first half year's work is easy. We sell them to graziers at six years old, and in eight months they come to Smithfield, good beef. In the intervening period, my work is done at the rate of about 80 acres of tillage to four oxen, and my twelve oxen, not including the three years old, will work 30 acres of land per week, when not employed in carriage of lime or manure, which is ten acres per week for each four oxen, or five acres for each pair; that is, two acres per day, for five days in the week, for each team of four, leaving them two resting days; their

day's work is done in seven hours and a half, which gives them sixteen hours for rest. If corn was allowed them, they would probably do more: if they did less, I would not use them at all. I allow one horse to every hundred acres of land, for extra work, and no more.

“ It may suggest itself to some, that an increased use of oxen in labour, by keeping employed those animals which would otherwise become part of the supply, at an earlier period, might increase our present difficulty: so it might; I would even prefer to endure a present privation, to secure a permanent and most important good. Be persuaded, that after the short period of three years, the foundation being thus laid, the supply would thenceforward be regular and abundant. For the support of our navy we have no right to depend on Russia. In Ireland, cattle are getting scarce; in this kingdom, far more so. But I beg pardon; I have pressed these arguments elsewhere, and forget, that at present, neither you nor the majority of your readers, see this matter in the light I do.”

The noble Lord has given as much, in the short compass of a letter, as the reader can learn from many of my laboured pages; in fact, has exhausted the subject. We learn from Lord Somerville's practice, established on the sure foundation of many years, or rather many ages of experience, that we possess a breed of neat cattle equal, in all respects, of physical ability to horses, for slow draught; and far superior to them, in point of profit. He demonstrates, by his own practice, the exertions of which our superior breeds are capable, and by his own observations those which we are justified in expecting, from the middling and inferior; lastly, the gradual means by which we may attain that national benefit prospectively exhibited to our view.

To the great example of his Majesty's practice at Windsor, upon very extensive farming establishments, where oxen are successfully and exclusively employed as beasts of draught, it may be objected—That Kings do not usually farm for profit; but which may be answered with equal truth and force, that our King is an ancient and experienced cultivator of the earth, and that the oxen on the royal farms perform their duty, and earn their keep, to as much advantage, as is generally derived from them.

Upon the practice of old times I shall not lay much stress, because of our great modern improvement in horses, to which the disuse of oxen for labour, is doubtless in great measure to be attributed: it remains for us to use, as far as we can procure them, the most proper breeds of oxen, to increase those, and to improve, for such purpose, to the extent which may be necessary for the service of the whole country. I say nothing further of modern foreign practice, than that ox labour is far more general, upon the continent, than amongst us; and that, in France, Spain, and Portugal, they drive their bullocks, both at plough and upon the road, with reins, ploughing with a pair, and no driver but the ploughman.

Respecting the readiest method of bringing oxen into fashion, as beasts of labour, I can add little to what I have formerly and repeatedly urged. It must be effected by the example, and the joint exertions of the chief members of our county societies. Every county should have a share of the working bullocks, which can be spared from those districts in which they are bred. Proper encouragement would promote an extension of those breeds, and the cattle would spontaneously find their way to the appointed fairs. Shropshire, I believe, breeds and trains annually, a considerable number of labouring bullocks,

for sale to other counties; this might be made a profitable kind of staple traffic in Devon, Somerset, Hereford, Glamorganshire, Sussex, Holderness in Yorkshire, and in any other districts, where a species fit for the purpose of labour may chance to be bred. A cross from bulls of some of the above breeds might produce, in any cows, stock tolerably adapted to labour. The only method, as far as I can judge, from the small experience I have had therein, to render the common sluggish breed of neat cattle tolerable for labour, is to allow them corn, which will undoubtedly promote in them activity and spirit. Half the quantity of corn commonly allowed to a plough-horse, might suffice one of those bullocks, and four of them perform the usual labour of two horses. Were the point settled, and the general inclination favourable, the period of time required to work up our present stock of horses, would about suffice for the production of a requisite number of their substitutes.

That a preference is due to the ox, as a labouring animal, I am inclined to attribute solely to his body being an article of human food; to the idea of his being capable of labour, without the alimentary support of corn, I never could attach any great importance theoretically, still less, since I have paid to the subject a certain share of practical attention. It is probably, mere habit, that we have continued the ancient economical method of feeding the ox, and that we have not tried its success with the horse. The latter measure, we know, has been strongly recommended in times of scarcity, by our economists; and in fact, has always been partially, and in the opinion of those economists, successfully practised. Has not the shining example of a Suffolk man been held up to public imitation, who, upon the large scale, fed

his labouring farm horses, through a course of years, upon nothing but raw potatoes and straw? Have they not discovered in Nottinghamshire, that both English and Swedish turnips are equal to oats?—and do we not find a number of such wonderful things in old Gervase Markham? I have been as diligent in experiments in this line, as most men; and once, (as I have related in another place) with the most ardent zeal of improvement, fed all my horses into the mange. We every day see farm horses performing tolerably, and even very well, in light work, on green meat only during summer, and on carrots, substituted for corn, in winter. These measures may be convenient in their proper season, and according to circumstances, profitable, without, in the smallest degree, affecting the incontrovertible abstract truth, that corn feeding affords the most solid nutriment, and consequently imparts the greatest portion of strength; including the further important consequence, that a smaller number of horses, corn fed, will suffice for the same quantity of labour; and there the wonder ends, and the bubble bursts. The great advantage enjoyed by the farmers in the West of England, from the excellence of their grass and hay, in both feeding and fattening their labouring oxen, must not be overlooked in the present question.

Probably, had fashion decided to labour horses, as oxen, without corn, the success might have been parallel; but to render it so, it would be requisite, with ordinary cattle at least, to yoke a great number to the plough, as with oxen. But although I can decide, from an hundred experiments, on the superiority of corn in both cases, I would, by no means, be understood to assert, that horses are upon an equality with oxen, in the ability to labour without

it; the most experienced persons seem to assign a superiority in the case, to the latter, yet I know not, that the experiment has ever been made.

In the sad case of actual scarcity, no question can be made of the utility of adding to the number of our labouring beasts, and depriving them entirely of corn; on the other hand, in the good times of peace and plenty, there is every legitimate motive, in my opinion, for its allowance to them. Corn is but money's worth, and if you obtain your price for it, the business is profitably settled. If you get labour in proportion to the corn you allow, you are paid for your corn, with the superadded interest of superior dispatch, and humane feelings gratified. In the present scarcity of bullocks, it is an object, by corn feeding, to get out of a pair of good ones, the labour of four of the ordinary kind, and to increase the labour of a good pair. It is, beside, to gain a number of important points. The labouring ox, well fed in his work, would be turned to keep in high store condition, instead of that of a skeleton, too generally the case at present. Corn feeding would do away the common and well grounded prejudices against oxen, on account of their slowness, bring them almost universally on a level of speed in their walk, with cart horses; in fact, establishing a superiority in that respect, on the side of Devon and Herefordshire bullocks.

I have not forgotten the position laid down in the account of the Royal farms at Windsor, that "harder labour and higher keep would be injurious, for the nature of the ox will not admit of his being kept in condition like a horse, artificially, by proportioning his food to his exertions." I do not recollect the name of the author of this strange opinion; but it is so totally contrary to the general tenor of expe-

rience, that it ought not to stand as a solitary position, unaccompanied by proof. I remember, in proposing, some years since, to one of the Turners of Herefordshire, who had been accustomed all his life to witness the labour of oxen, on the road and at plough, to allow corn in proportion, as to horses; he observed, yes, a little is useful; but full corn feeding would cause eruptions in the beasts; not, however, that he had tried such a plan. We are not troubled on that score, even in the stall, where corn fed oxen have no exercise.

We are now and then regaled with accounts of the vast advantages to be derived from the labour of asses and mules, upon a light land farm, where they do wonders, at a trifling expence for keep. Without disputing the practicability of making such trumpery shifts, I cannot help admiring that patient perseverance which must be exerted in collecting teams of such description; and which, I humbly conceive, would be exerted to far more profit, in finding oxen small enough for the purpose. The labour of these last being finished, they would render an account somewhat different to an ass and mule account. Perhaps a small and active breed of oxen may be a desideratum for various purposes; ploughing light land, hoeing between rows, and even for carrying burdens. I must own, I would rather see a Norfolk labourer riding upon a light, active, square little bullock, than upon a donky. Such, or in fact, any given form of animal, might be raised by the ingenious hand of modern improvement. Perhaps an union of the Indian Zebu and Scotch Kyloe might produce a very pretty, useful, and eatable poney.

The calf intended for labour, should be handled and familiarized as early as possible. I conceive it would be a useful point gained, and I see no difficulty

in the attempt, to accustom the young steer to present his foot to the shoeing smith, as readily as his fellow labourer the horse. This indeed, is partially the practice within a few miles of me; but more generally the bullock is cast to be shod, and not unfrequently put into great alarm and trepidation, a thing strictly to be avoided with oxen, which are liable to affright, and of which I formerly gave a remarkable instance. A fair field here presents itself to the inventive faculties and skill of our modern veterinarians, in which their pretensions to originality could not be made matter of dispute; a good, useful, form of shoe is wanted to defend the feet of the labouring ox.

Mr. Bakewell, it is recorded, used to work moderately his heifers whilst carrying their first calves; an unobjectionable practice, provided they be well fed. Bulls are generally allowed to be good labourers, and capable, if high fed, of vast exertions: to improving breeders, it must be a great saving to work their bulls, as they may have occasion to keep a variety. It is curious to read in our old books and their copyists, that no human power would be equal to the taming a herd of bulls: an enterprise, we are to suppose, more Herculean than that of taming a bevy of shrews.

Breaking the young steer to the yoke can offer no great difficulty to men accustomed to the same duty with the cart colt. Temperance and patience will best do the business with both; but I am sorry to say, that I saw, in the West of England, the most shameful intemperance practised in this business. It seems, in Devonshire, they have the absurd custom of sometimes suffering their colts to run unbroke, until five years old, and then of subduing their necessary stubbornness, by the most severe and cruel usage. Going suddenly into a stable, I was nearly petrified,

to see a thick headed fellow belabouring with a club stick and all his force, the shanks of a fine young mare, haltered fast in her stall, with as much composure as if performing a regular and necessary duty. The poor animal, from custom, and the contempt resulting from her stoutness of heart, bore this severe usage without flinching. The blows wounded my sensibility so deeply, that I feel them at this moment. What is very curious, the fellow's surprise equalled mine; he seemed to wonder what there could possibly be of the extraordinary in this affair. I wondered no less, regretting that, in the finest country upon earth for breeding horses, so little should be known about the matter.

Oxen are said to draw an equal weight with the collar, as with the yoke and bow; the latter, often too heavy, is a piece of antiquity retained perhaps chiefly from motives of economy. In Ireland, where they are running the race of rural improvement with great and commendable vigour, they have added the bit, I understand, to ox harness. The ancients were in the habit of occasionally purging their working oxen, in which intent, Glauber's salts will be found very useful. I have sometimes observed bullocks in a feverish state, after much fatigue; also, in the state of ligamentary lameness, in which horses are often found, from over exertion and strains. My former observations on this subject may be referred to, in *The Treatise on Horses*, 2d edit. Vol. I. p. 322. Vol. II. p. 121. *The Modern Land Steward*, p. 101. *The New Farmer's Calendar*, 4th edit. p. 512.

A COLLECTION
OF
VARIOUS OPINIONS AND PRACTICES
RELATIVE TO
NEAT CATTLE,
FROM ANCIENT AND MODERN AUTHORITY.

ANCIENT Greece and Rome produced many distinguished writers on rural affairs, consequently, on the breeding and management of cattle. Of these, the work of Columella has descended to latter times, in a state of sufficient perfection, to leave us very little cause of regret for the remainder which have perished. *Lucius Junius Moderatus Columella*, from his writings, appears to have been a native of Cadiz, in Spain, most probably of a Roman family. He flourished in the reigns of *Tiberius* and *Caligula*, contemporary with *Annæus Seneca*, whom he commends for great erudition. His twelve books seem to embrace all that was known, in those early times, on the subjects of husbandry, gardening, and even housewifery; very little of which is at all applicable to modern times; much of it, in course deformed, or rather rendered ridiculous, by those irrational and unphilosophical ideas, which, to the just astonishment of modern common sense, prevailed in the minds of the greatest men of antiquity. *Columella's* Latin is of considerable purity and elegance; a very moderate portion of which is transfused into the English version, made about half a century since, which, however, as far as I have examined, has the superior merit of sufficient fidelity and correctness. Doubtless, the noble au-

thor who lately expressed his desire for a new translation of Columella, was allured by the diction and the copiousness of that writer, and the great variety of curious information relative to ancient practice, to be derived from his work: from such motive I have made the following extracts, which may help to determine in what degree we may be benefited by a communication with ancient practice. Columella teaches——

“ It is proper, when oxen are at work, that they be yoked close to each other, that they may go the more gracefully, with a lofty air, and their heads elate; that the yokes be fit and set well, their necks will so be the less weakened. Such is the most approved method of yoking; for that which is in use in some provinces, of fastening the yoke to the horns, is rejected almost by all who have written precepts and directions for husbandmen. Nor is this without reason, since the cattle can exert themselves and use greater efforts with their necks and breasts than with their horns: by the former method they labour with the whole bulk and weight of their body; by the latter they are put to great torment, their faces being turned quite upwards, and their heads drawn back; and with a very light ploughshare they are scarcely able to wound the uppermost part of the soil.” (The matter at this hour stands precisely in the same state upon the continent; in some parts oxen draw by the head, but generally the yoke is affixed to the neck.)

“ As soon as the ploughman has unyoked his oxen, let him rub them, and press their backs strongly with his hands, *pulling their hide, and not suffering it to adhere close to the flesh, for such adhesion constitutes a very injurious disease.* Let him rub their necks thoroughly, and pour pure wine into their jaws if they be extremely hot. Two *sextarii* (or pints) are sufficient for each. The oxen are not to be tied to their cribs,

until they cease to perspire and pant. Nor is it proper to give them much food, even when it shall be due time to feed them; but their allowance should be dispensed in small quantities at a time, which having finished, they may be led forth to water, and inticed to drink *by whistling*; immediately afterwards they must be satisfied with a larger allowance of fodder. [Our modern farriers acquired their erroneous notions of the disease called *hide-bound*, together with their absurd practice in the case, from the ancients. It is even asserted by one of our latest writers on farriery, that the old, senseless, and cruel operation in this supposed disease is still practised in Staffordshire, and that an instance of it lately occurred there. “The head and legs of the horse being secured, two men, one on each side, pull the hide from the ribs in about fifty places with pinchers!”]

“OF BREAKING OXEN. Calves, whilst yet young, to be handled, and tied to the manger. Steers ought not to labour before their third, nor be taken in hand for breaking after their fifth year. In breaking they ought to be corrected moderately, and with temper, and with gentle blows from a willow plant. First to be taught to walk in hand. The young steer may then be yoked to an empty cart, and afterwards to the plough, in light land and easy work, that the yoke may not bruise his tender neck, and discourage him at the outset. Care must be taken that he touch no person with his horn or heel, a vice which he may ever after retain.

“But where seasoned cattle are at hand, the young may be trained in a more expeditious way; for a bullock may be broke to the cart or the plough by being yoked with a strong and gentle ox, which will pull back the young one when he is too eager, and lead him on when he lingers or stops. A headstrong

or restive beast is with the most facility subdued in a plough-team of three abreast, in which he has the middle place. Placed between two steady and powerful partners, he is no longer at liberty to refuse and disobey, for his rage and fury are useless; and should he leap on one side or the other, he still finds a sufficient check, and is kept in his place; or should he stand restive, or attempt to lie down, he is drawn along or held up by his fellows, and with a very few strokes, is thus compelled to go forward.

“ There is an ox of a softer kind, which, although accustomed to labour, will lie down in the furrow. I am of opinion that he must be cured, not by cruel inflictions, but by the efforts of reason; and they who judge that this vice in beasts is best removed with goads, or fire, or other torments, are ignorant of the nature of reason, since, for the most part, the stubbornness of the animals does but uselessly weary out the person enraged against them. It is, therefore, preferable to subdue this vicious stubbornness in the ox by the powers of hunger and thirst, without actively tormenting his body; for his natural appetites will affect him more sensibly than blows. It is proper to bind him where he lies with ropes, so that he may be unable to rise for food: hunger and thirst will so subdue his restiveness.

“ This sluggishness is, nevertheless, very rare in our own country cattle; and our home-bred oxen are better than strangers, which may be affected by change of water, of fodder, of climate, or of country, either from mountainous to low and champaign, or the reverse. It is further to be observed, that to yoke cattle unequally with respect to stature or power will ever prove injurious to the weaker.

“ The temper and disposition of this cattle are most approved which approach the mild and gentle, rather

than the violent and fierce, still without a sluggish heaviness; dismayed at loud and blustering words, yet with such a confidence in their own strength, as not to be startled at common objects of sight or hearing, or afraid to ford rivers or pass bridges; which are great feeders, but slow in mastication: for these digest better than such as devour their food greedily and with haste, preserving their condition and bodily strength. But it would be an equal fault in one who uses labouring oxen to make them fat as to keep them lean; for their condition of body ought to be moderate and fit for business, robust and full in the muscles, but not loaded with fat, whence they would be jaded and wearied by their own weight."

[The humane advice in the case of oxen lying down in the furrow is infinitely to the credit of this ancient writer, and I am sorry to say, that we are not entirely without examples of that barbarous and stupid practice which Columella so rationally reproves. Our countryman, Leonard Mascall, however, gives the most efficacious prescription for the malady; namely, a sufficient dose of barley in the straw. It may be safely averred, that the far greater number of cases of the ox lying down in his labour arise from the debility, sullenness, and lowness of spirit, consequent on poor keep. In the mean time it is equally true, that there exists a natural and inherent viciousness in some few oxen as well as in horses: since this last defect admits but of a partial cure at best, and as a beast in such predicament may in one minute do more mischief than will overbalance the whole services of his life, such should be instantly discharged from labour.]

"In COLD WEATHER the oxen must lie within doors, upon stubble stacked for that purpose, within thirty days after the harvest. Green fodder is preferable to

all other food; which generally consists of vetches, *cytusus*, elm, ash, and poplar leaves, mast, which last is apt to breed the scab: of dry food, meadow hay in bundles, chaff, straw, lupines, bruised beans, grape stones. Barley is allowed to labouring oxen which are required to perform their full task; or, without corn, forty pounds of hay per day to each. From April, throughout the summer, green fodder is to be cut for them. A *modius* (somewhat more than a Winchester peck) of mast, or steeped lupines, or seven *sextarii* (pints) of bitter vetches, sprinkled with water, or twelve *sextarii* of chichlings, or a *modius* of grape stones, to each ox, with his fill of straw and chaff, is a sufficient allowance."

[*Cytisus spinosus*, or *acacia trifolia*.—This plant is much commended by Columella, as excellent food, either green or in hay, for all kinds of cattle, which it will fatten in a short time; also for poultry and bees. When dried and steeped in water twelve hours, he recommends the infusion mixed with wine, to increase milk in women, and to enable them to suckle without injury to their health. Thence also this plant is particularly adapted to breeding ewes, and is cut green in Italy eight months in the year, and afterwards made into hay for winter store. It is represented as flourishing upon any kind of land, even the poorest, and bearing with any ill usage unhurt. It thrives in most parts of England; but has never been cultivated here as cattle food. The acacia trefoil may be planted either in autumn or spring, by setting the tops four feet distant every way, if you have no seed, which indeed is difficult to save. The seed is sown in beds, and the plants afterwards set out. Columella directs not to cut it until after three years. It was the custom of the ancients to mix a large quantity of common salt

with their fodder, to strew it upon the rocks, or leave it in troughs in the pasture, the cattle licking it up greedily.]

“ In an annual review of the cattle, such cows as are old, or have ceased to breed, or will not take the bull, must be removed, and may be broken to the plough, since by reason of their barrenness, they are able, no less than oxen, to endure labour and fatigue.

“ BULLS, under four, or above twelve years of age, are not deemed profitable for procreation; nor ought the cow to be under two years of age, or more than ten. The month of July is in general the most proper time for cows to be put to bull; since, going with young ten months, their offspring will come at a season of plenty.

“ The cow must not be too fat when offered to the bull, since too high condition may render her barren. One bull will abundantly suffice fifteen cows. When the bull has leaped upon an heifer, you may know by these certain signs which sex he has generated: if he leap off from the right side, it is evident he has generated a male; if from the left, a female. Further, *Democritus* affirms, that it depends upon our own pleasure whether a male or a female be conceived; and directs, that when we desire a male, we ought to bind the left testicle of the stallion, or other male, with a small flaxen cord; and when a female, the right testicle.

“ At calving it is the custom to allow the cow green *cytissus*, and parched barley, and bitter vetches sodden; or a drench of the decoction of young coleworts, with toasted and ground millet, soaked in milk during a night. Bruised beans and wine are also given. There are *Altinian* (q. *Alpine*) cows of a low stature, which yield abundance of milk, for which reason their own offspring are removed from them, and bred up at the udders of other cows.”

Mago is of opinion that calves should be CASTRATED when very young, and directs the operation to be performed either in the spring or autumn, when the moon is decreasing; but should the calf already have become strong, and the parts firm, it is better to castrate him at two than at a year old.

Of HORSES, Columella gives the following sage caution respecting a pretended fact, which seems to have been really credited by the ancients. "Great care must be taken, about the time of the vernal equinox, that both mares and stallions have full liberty to copulate to satiety, because this species of cattle, and more particularly if you restrain them, is stimulated by the most furious raging of desire. Hence the name *hippomanes* is given to that poison (an excrescence, real or pretended, in the forehead of a newborn foal) which being administered in philtres, kindles in mortals a fire of love equally ardent with the libidinous desires of horses. Nor is there any doubt, but that in some countries, the mares inflamed with a furious and irresistible desire of coition, by continual and excessive longings, raise in themselves powerful and creative imaginations of the act, that, like hens constantly confined in the yard, they conceive by the wind, without any assistance from the male. And it is a thing well known, that on the sacred mountain in Spain which extends itself towards the west and to the ocean, mares have frequently become pregnant without coition, and have brought up their offspring; nevertheless such foals are of no use, being snatched away by death when three years old, and before they arrive at maturity."

[Our early writers on cattle have generally repeated the above fooleries, but that which was, and even still is, of real ill consequence, many of the barbarous and senseless tricks and operations upon wretched

animals, practised and recommended by the ancients, are not even yet exploded. From this source of conjuration, our infallible leaches, grooms, and shepherds, have derived their wonderful skill; but those masters who put implicit confidence in such knavish block-heads, are themselves, surely, so far, no conjurors. To suffer the testicle of an animal to be tied up, and the emission of semen to be forcibly prevented by a ligature during coition, although it can possibly have no sort of connection with the sex of the *fœtus* about to be engendered, will most assuredly be productive of great pain to the animal, and in all probability, of obstruction, inflammation, and a swelled testicle.]

LEONARD MASCAL, farrier to King James I. [I have never seen Mascal's first edition; the book before me is 'The Countryman's Jewel,' or Mascal improved and enlarged, by Richard Ruscum, Gent. 1680. Experience and analogy are a cure for the wonders, or a man might be tempted to wonder a little, how it could be upon the scale of possibility, that such execrable and illiterate trash as the books of this Mascal, and others of similar type, could possibly have had currency and credit, amongst, not to say an enlightened, but a people merely endowed with the common reasoning faculty. Our admiration is still heightened, when we reflect, that whilst such writers as the above were patronized, and their works were running through numerous editions, the respectable Blundeville was forgotten, and the learned Baret never able to *publish* his book. But what are we to think of late writers of ability and merited reputation, who have spoken, both of Mascal and Markham, as good authorities on the diseases of cattle? How can it possibly be otherwise, than that it requires the same light, theory, or previous reflection, to understand, and cure the diseases of the mere animal, as well as of the human bodily

machine? Yet, as I have often seen, and in the opinion of a celebrated physician, the best education does not secure a man from strange errors on this subject; and the instances of application in such men to bone-setters, quacks, and farriers, not only in the behalf of their animals, but even in their own personal maladies, are notorious and numerous. Men of the strongest and most cultivated intellect, in this case, as in another, implicitly giving up their reason, look no further than to the form of the words, and suppose that a medicine can operate no otherwise than by magic, and as a charm: therefore all they require, is that most nonsensical of all nonsensical things, commonly called A RECEIPT: and many an honest gentleman, and his good lady, have treasured up among their family valuables, an infallible receipt, which their grandsire had carefully transcribed from the far-famed Leonard Mascall. I hope to see the time, when the people of this country, concerned in cattle, will be thoroughly sensible of the obligations which they owe to the memory of the enlightened Gibson and Bracken, who first cleared away the superstitious and senseless rubbish of antiquity, and placed animal medicine on the firm base of philosophical and experimental truth.]

[A quotation or two from Mascall will enable the reader, who has not had the opportunity, by a perusal, to appreciate *The Countryman's Jewel*, at once to determine on that author's abilities on any subject. The fastidious and saturnine who so justly condemn the introduction of any thing extraneous, more especially if tending towards the burlesque, in a book of mere matter of fact and common sense, are humbly requested to pass over the following.]

Mascall's dedication to Sir Edward Montague begins as follows—"It is written in histories (right worshipful) that the sons of *Seth* and *Seneca*, or some

other zealous philosophers, being desirous to leave something worth memory unto their posterities, did make two pillars, one of brass, and another of earth, wherein were graven the principles of the seven sciences, to the end their successors should understand the good wills of their predecessors: whereby they did set forth and shew all such good knowledge and learning as they had found out in their time, to the furtherance of their commonwealth."

[Leonard, living in an age when great merit and consequence were attached to the belief of ancient histories and traditions, either actually believed, or *believed that he believed*, (suspicion of being suspected) which answers equally well, the possibility of solitary impregnation in mares: on which he thus says and sings) p. 7—"for he that keeps these sorts of beasts, must serve them at the same hour, when they are desirous, or when they enter into the fierce and hot desire of the horse, which is (as *Hippomanes* says) a venom, because it inflameth both men and beasts, and so have the like rage in love as horses and mares: for mares may conceive of themselves, without the company of the horse; as without doubt it is most true, that in some countries &c." and as the poet Virgil, in his third book of *Georgics*, saith thus:

"Above all beasts great love there was,
In these hot sort of mares,
And was oftimes in Venus' love,
By fleshly mindful cares.
Which Glaucus punished was
For his audacity,
By carrying of such mares
Into the isle of Ponty,
Which love did cause them range
The mountains of Gargary;
Also Ascany, and
The mountains of Gargary.

Through springs and mighty rivers,
 Themselves did oft torment,
 By eating of the herb in spring,
 That heat did still augment :
 They turning on the mountains high,
 All right against the wind,
 (Saith my author Zephyrus)
 In their hot burning mind,
 They so became with foal,
 Without having the horse, &c.

[Mascal, we see, has made a most notable discovery of two ancient authors, totally unknown before, to wit, *Hippomanes* and *Zephyrus*. And, although, whether as a translator of Virgil, or as a prescriber in the diseases of animals, his capacity is perfectly equal, a truth addressed to receipt-hunters, we will endeavour to extract part of the common sense his book may afford ; first repeating the eulogium of his editor and commentator, Richard Ruscum, Gent.]—" The first that obliged the world with this most useful treatise, was that judicious and fortunate MASCAL, chief farrier to King James, and how acceptable it was, may appear by the numbers of them that were sold in those times."

" Stalls of cattle to be cleanly kept ; poultry and hogs never suffered there, their dung and feathers being unwholesome, and even infectious to cattle. The keeper ought to rub them daily and kemb (comb) them, with a card, which will make them the lustier ; and to wash their feet with water, when as they labour not, will do well.

" An ox will serve to labour till he be ten years, not after so good : he will live fifteen or sixteen years. Wild oxen are better to bear a burden than to labour ; for they are never so free nor so strong to draw as the tame. A cow will wax feeble after fifteen years. If ye shall see knots in the mouth of a cow, then judge

she hath not cleaned of her birth: then must ye take them from her, or she will die.

“An ox will fat soon with vetches, pease, boiled barley, or bruised beans, or hay. Acorns only will make an ox scabby, except they be dried and mixed with bran. An ox intended to be fatted may labour gently, once or twice a week, fed on barley and hay. Going in the sun doth make him like well, and to wash him twice or thrice a week with warm water: also coleworts to boil with bran, doth make them have soluble bellies; and it doth nourish as much as doth barley. Your oxen are less subject to disease than your horses, yet to preserve and keep them in health, our elders did use to purge them every quarter, three days together.

“Fitzherbert saith, if a man buy lean kine, or oxen to feed, ye must see they be young, for the younger they be, the sooner they will feed: (it may be presumed, he meant not worn with age and labour) and look well that their hair stare not, but that they do use to lick themselves: and see also that they be whole mouthed, in wanting none of their teeth. For although he have got the gout, and be broken both of tail and pizzle, yet will he feed: but an ox having the gout, will not be driven far: ye shall chuse him with a broad rib and a thick hide, and not to be loose skinned, nor yet stick hard to the ribs or sides, for then they will not feed so well. Best every year to rear some calves and foals. If ye buy oxen for the plough, see they be young and not gouty, nor yet have broken hair of tail or pizzle.” (By *gouty* is meant legs swelled from labour, or other cause as with horses.)

“Also in buying either oxen or kine to fat, ye shall first handle them and see if they be soft on the crop behind the shoulder, and also upon the hindmost

rib, and upon the huckle bone, and on the nath by his tail, and to see likewise if your ox hath a great cod: and a cow to have a big navel; for that is a good sign she should be well tallowed. Ye shall also look that there be no manner of sickness among these cattle in the quarter or parish where ye intend to buy: for if there be either murrain or long saugh, or other infected disease, it is great jeopardy buying any beast coming from thence: for one beast will soon take sickness of another, which sickness will perhaps continue ten or twelve months, or more, ere it will appear on him. If any beast chance to be sick, ye shall avoid him soon from the rest.

“Also if the husband do go with an ox plough, it shall then be meet to rear two ox calves, and two cow calves yearly, to hold up his stock: it is better to wean calves at grass than at hard meat, if they were at grass before: and those that can have several pastures for their kine and calves, shall do well and rear with less cost than others. The weaning calves with hay and water will make them have great bellies, because they stir not so well therewith as with grass, and they will the rather rot when they come to grass. And again in winter, they would be put in houses rather than remain abroad, and to give them hay but on nights, and to pasture them in the day time. And thus being used, they shall be much better to handle, when they shall be kine or oxen.

“The loss of CALF, LAMB, OR FOAL, which is the least loss?—This Mascal determines to be the loss of the calf; because he says the calf will suck as much milk as he is worth before he be marketable: then the ewe to cast her lamb, which is yet a greater loss than the calf, since of the ewe-milk there cometh really no profit save the lamb, for although in some countries they wean their lambs and milk their ewes, yet it hin-

ders the ewes from taking the ram in due season, and often over-milking renders many barren. But if the mare cast her foal, it is thrice as great a loss as the other two, the foal coming of a good breed, a most necessary thing for every man to provide himself with, *since a bad mare will cost as much in keep as a good one.*

“CATTLE MOST MEET TO PASTURE TOGETHER. It is not so good or profitable to have cattle all of one sort in a pasture, not even sheep, except upon high grounds; for they will not, except it be greatly stocked, feed even, but over-run, and leave many tufts of grass here and there, untouched. Horses feed and agree well with other cattle, eating that grass which others will not, and loving to feed on low grounds, plashes, and hollows. Yet horses and sheep agree least together, unless there be an upper ground for the sheep. Horses are said to love a sweet and close bite as well as sheep, only that it takes them so long to fill their bellies. To one hundred cattle in a low ground ye may put twenty horses; and if the grass be plenty, ye may add an hundred sheep, and so on in proportion, and your grass will be fairly eaten. In a high ground put on a greater portion of sheep. Kine and draught-oxen will eat a ground much barer than fatting-oxen. Draught oxen cannot have too much meat, except it be the latter grass of a low mowed meadow, which will cause them to have the *gyrie*, and then they will not so well stand their labour. If there be very much grass in a close, cattle will feed the worse thereof, for better is a good sweet bite for the cattle, than a large and deep grass, of which the beasts will bite off the top only, leaving the remainder on the ground to rot, no beast being willing to eat thereof, but horses only in the winter. Different cattle are not to be foddered together in winter; for bullocks

with their horns will gore both horses and sheep : wherefore it is best to make standing racks and cratches, and to cast the meat therein, the rack-staves being set somewhat nigh together to prevent waste. It were rather better to change their places every day where fed."

(Mascal says, you may as well give a milch cow too much meat as too little, for that a fat cow will give less milk than a lean one. A veri-similitude merely, since the exhaustion occasioned by constant milking will require all possible nourishment, and deep milkers will never fatten, even upon ample quantities of the most nutritious food. As to turning cattle into high grass, a waste of which formerly we had plenty of examples, the error I believe is pretty well cured by the vast and increased value of keep, as the high price of seed-corn has promoted drilling.)

"FATTING OF OXEN IN THE STALL. Ye must take them up into the stall in a dry day, for if ye stall them wet, they will have, as some graziers say, *warnel worms* on their backs." (Whatever credit may be due to this old notion, it certainly might be beneficial to the cattle to be wiped dry and clean on their admission into the stall. It is directed to comb the oxen with a wool-card or curry-comb, with the reserve that fattening oxen do not receive so much benefit therefrom as those which labour ; probably an error.)

Oxen once stalled should not be suffered to go abroad, but receive their water either in wooden bowls, or in a trough supplied by a pipe and cock, the troughs to be cleared, and the water replenished twice a day. The troughs to be set on a slope, and the water to be discharged by a pin. Bullocks confined reject water from which they have once drank, at least prefer fresh. All their old provender should be cleared away at feeding. Their trough to be placed on the further

side of their crib, two feet high or more, the rack full four feet high, and nearly as broad beneath as above, for fear of tangling their horns therein, the staves of the rack not more than four inches asunder. Chaff occasionally given will occasion the oxen to drink much; hay makes the hardest flesh.

The standards and posts to be substantial and fast set, above and below; smooth, and of sixteen inches girth, seven feet long, and four feet one post from the other. The oxen to be fastened to the posts with a bow, with a bow-withe, made shackle-wise, sliding above and beneath his neck on the standard, so that the one side of the neck shall be always close unto the said standard or post: by which order of tying they shall not be able to bow their heads to lick themselves. A cradle on the neck will prevent licking, but it is a hindrance to their lying down. Smearing their bodies with dung and ashes has been practised for the same purpose, (a stupid and inefficacious practice.) Their mouths to be examined from time to time, and cleared of *barbs*, or any impediment to feeding. The urine may be caught in earthen pots set in the ground.

A beast in the house is *SOUND*, if in the morning fasting, water-drops stand upon the tip of his nose like pearls of dew, but if his nose be dry, he is not in health (a rule by no means infallible.) To try the soundness of cattle, gripe or pinch them with your hand on the withers behind the fore shoulder, if sound they will not flinch; if otherwise will shrink under your hand, and be ready to fall. (Not a whit more infallible than the former.)

FROM GERVASE MARKHAM. (For a character of this author see *Treatise on Horses*.) “Salt strewed on the boards or stones, good for the preservation of the health of cattle. Sand strewed upon the planks to prevent stalled oxen from damage by slipping. Draught

oxen to be well littered at night after their labour. It is not a good sign for a day labouring ox to bate none of his flesh, but to continue fat, for he is phlegmatic. (This indefinite remark is copied from the ancient writers; if an ox be heavy and sluggish in his work, taking too much driving, such is the best reason in the world for replacing him with another of more blood and game, instead of drenching the former with any of the useless slops directed in the case.)

(If the two letters, published in the Gentleman's Magazine for November, 1803, be authentic, Markham must have been a man of some degree of consequence in his day. The first letter contains a most curious challenge from Sir John Holles, afterwards Earl of Clare, which the redoubtable Gervase answered in terms equally curious. They both bandy about the lie most handsomely; but Gervase comes more manfully to the *point*. Sir John tells Gervase, "he is a rascal and a vagabond, as having nothing, and that himself has £1000 a year and better." Gervase challenges the Baron 'to the field, on new year's day next, with his rapier and dagger, his company to be a boy of fifteen years of age, to fight in their shirts and waistcoats.' This happened in 1597.)

J. Mortimer, Esq. and Edward Lisle, Esq. both of them respectable landed proprietors and experienced cultivators. These gentlemen farmed in the latter part of the seventeenth, and during the first quarter of the eighteenth century. Considerable light on all subjects had diffused itself in their time, and they were generally, and with some few exceptions, far above those superstitious ideas respecting cattle and their management which had been so universally received. Many well-founded practical rules and observations may be derived from their works, although they had not attained a systematic knowledge, and, in fact, were

by no means *au fait*, either as practised judges of live stock, or as horse jockies, an eminence achieved but by a few of the initiated amongst the writers *de re rustica*, whether ancient or modern. Mr. Lisle seemed more desirous of making a vast collection of opinions respecting cattle than of forming any on the more proper ground of his own experience; indeed his mind was absorbed in speculations of a far less profitable or rational tendency.

Mortimer recommends the Yorkshire, Derbyshire, Lancashire, Staffordshire, &c. obviously meaning the long-horned cattle, for grazing, and the short-horned, or Dutch, for the pail, which it seems in his time were leggy and tender, and chiefly to be found in Lincolnshire and Kent.

“If any of your cows slink their calves, do not let your other cattle come at them for a fortnight, nor in the pasture they slunk in till after rain. If a cow will not let a strange calf suck her, rub her nose and that of the calf with a little brandy.

“For winter-ploughing, and on a heavy soil, Mortimer often found OXEN as good as horses, yet without any allowance of corn. He recommends plenty of hay with their green meat, which will doubtless conduce to keep their bodies firm; and mentions a sort of a long-legged, nimble ox, that they sell at St. Ives fair, in Huntingdonshire, which will, of any work, do almost as much as a horse.” Chalky land surbates and spoils the feet of oxen more than any other soil. Of FAT CATTLE two returns to be made within the year, or young lean cattle to be kept the year through, for the advantage of their growth.

“BARLEY STRAW, a tolerable food for dry cattle, is unfit for milch cows, which should have oat straw if any. The long sour grass, which the cattle will not touch during summer, is rendered sweet by the first frosts,

and agreeable to their palate. (It should be mown and given to the cattle in a dry place.)

“ An ox that cost six pounds (now twelve) will need two loads of hay to keep him throughout the winter. For GRAZING of land, you may do it with beast and horses together, or with beasts first, and then horses; afterwards put in sheep.—Let not your grass be too rank before you stock it, as it will be sour, and scarcely any beast will eat sour grass but young Welch heifers. Often change your cattle from one inclosure to another, by which means your grass will obtain a fresh head, and fresh grass is a mighty help in feeding cattle.

LISLE. “ The stronger and richer the land is, the more must cattle be kept up to a good pitch; for if on such land cattle are in the winter suffered to run to poverty, or are brought into it poor, they will be liable to the yellows, and the blain, and most sorts of distempers; for it is the same as if you should offer strong meat to weak stomachs.

“ With large cattle poor ground is very apt to have its herbage tainted by the dung; in which state the cattle will not feed the pasture clean, and ought to be timely withdrawn. CLOVER intended to be kept the second year for feed, ought not to be grazed the first year by sheep, which bite so close as to wound the crown of the roots. (The same of other artificial grasses.) The leaves and stalks of artificial grasses being full of juices, cattle fed upon them, even in the driest summers, scarcely need water. Sheep fed on clover will dung quite moist, whereas their excrement when fed on natural grass will generally be hard and dry. (A double advantage in the artificial grasses, during seasons of great drought, neither the grass or the cattle will feel the common want of water.)

“ Cattle and sheep are in danger of BURSTING in clover whenever rain comes, although the cattle may

have been turned in when the clover was perfectly dry. Turned from natural grass to clover, they are not (unless their commons have been very short) liable to overfill themselves, not so well relishing the flavour of any artificial as of natural grass. The reason horses are not so liable to be hoven as cows or sheep, is from the time taken in mastication, they do not overload their stomachs so suddenly, and being masticated and reduced small, the herbage does not lie in such a volume as to fill up the stomach, and occasion obstruction. Instances of two beasts dying hoven, in very rank and luscious aftermath, of sudden growth from warm rains. Mixing hop, or white Dutch, with the broad clover, said to be a preventive in this case. (Probably cow grass more proper, since even grass, if it have a great admixture of Dutch clover, will burst the cattle.)

“ A large crop of hop-clover after barley, found insufficient to carry on fattening bullocks, or even to support well, labouring oxen. In a fortnight after the head of the clover was taken off, the beasts fell away: it was attributed to their eating so much stubble with the clover. Middling ground will almost fatten cattle in spring, when the herbage is full of sap, but the aftermath of good land only will support and carry forward a bullock. The poverty of grass is seen by its dying away and losing its colour in autumn: such feed is then lost on a bullock.

“ Cattle thrive best on WINTER STRAW, when, beside the straw, they have a range of pasture. Although a taste of spring grass will draw the appetite of cattle from dry meat; yet in early spring, and before there is a full bite, they will eat heartily of both straw and hay in the morning, whilst the dew remains upon the grass, in which state, and before the sun has exhaled the moisture, the grass is raw and cold: at such time

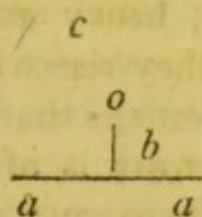
the bullocks may be seen standing under the hedges, forbearing to feed until the dews be dried up. On the contrary, in summer time, when the juices of the grass are thoroughly concocted, all cattle are more desirous of feeding in the mornings and evenings, whilst the dew is upon the grass; in which sense only Virgil is to be understood, when he says—“*Et ros in tenera pecori gratissimus herba.*”

“The loppings of several POLLARD OAKS lying in order to be fagotted, the beasts of the common came and browsed upon the buds, by which five cows were killed. (Yew trees are particularly dangerous to cattle, and should ever be lopped higher than they can reach.)

“WEANLING CALVES will not fill themselves even in the best grass; but look hollow, and wander about bleating, unless they have plenty of water. In the straw yard cattle will ever be more thrifty for having water at command, having, on account of the dryness of their food, need of drink several times in the day. Water troughs, fed with wholesome water by a cock, are a great convenience in a straw yard, where a pond is usually a great nuisance, and where the animals drink not only the essence of their own excrements, but of every other creature near the spot.)

“STALIED OXEN, as they grow fat, being naturally very hot, their hides will *peal*, and they will lose their appetite in very close standing, and unless they have air; therefore best to have the sides of the fatting-houses open: they can scarcely be kept too cool, provided they be dry. Lean cattle can scarcely be kept too warm. Labouring oxen, if they get loose, do not fight. Poor cattle may be restrained by very slight FENCES; but such as are in high proof will break bounds, from want of water, or on any disgust, unless the fences be very substantial.

“The annexed figure represents a clog, to hang at the bottom of a yoke or shackle, to prevent a beast from leaping: it may be increased according to the bigness of the beast:



c the hole through which the shackle comes—*b* eighteen inches—*a a* three feet long.

“COLLARS for bells to hang upon the necks of beasts to be turned into woods, not to be made of withs (twisted willow twigs), since they gall the necks, which wounds are exposed to the fly, and the withs are besides liable to catch to the bushes. A strong whit-leather answers very well; but the best collar is made of smooth iron plate, from which the bell sounds better, and is held off from the animal's breast, nor does the iron chafe.

“The great convenience of several DIVISIONS in a fold yard. HAY once given must be continued through the winter. In washy weather all the hay that one can give to cattle will not make them thrive; but in dry frosty weather they will thrive upon it. Hay made of long, sour, rushy grass, in bottoms, is not so nutritious to cattle as straw in a good year, and cattle will become lousy from feeding upon such hay. (As to the first, if you take the cattle to the house in continued rains, or alternate frost and rain, and keep them dry, they will receive the usual benefit from hay. The coarse hay, as above, should be given cut up with pease, oat, or other straw.) Whether in grazing or

dry feeding, cattle will rather eat after a different species than after their own, which they dislike.

“ Cattle, left out LATE in the season, should be foddered early in the morning, and not compelled to eat grass with the hoar frost upon it, which indeed they dislike. Stradling racks, heavy and strong enough not to be overturned as they rise with the accumulating dung, are more convenient than fixed ones. (The caution respecting hoar-frost is of particular consequence in the north, where vast numbers of cattle and sheep perish annually from disorders occasioned by receiving the congealed water into their stomach.)

“ The longer the straw of any kind, the worse as fodder; short straw is said to be invariably the most nutritious: cattle always prefer that which is fresh thrashed, a day even making a difference. (Straw intended to be kept should be stacked and pressed down very close; or cut to chaff, and laid close in a heap, covered and surrounded with straw.)

“ THISTLES being cut young, and withered, cattle will eat them in that state, although not when green. ELM LEAVES, gathered green, and suffered to dry in the sun upon the branches, the spray being stripped off, in August, will prove a great relief to cattle in winter, or in scorching summers, when hay and fodder is dear. Cattle, it is said, will eat this food greedily and profitably. The boughs must be preserved in a dry place, or the leaves will mildew. Formerly, in Herefordshire, according to Mortimer, they gathered elm leaves in sacks for the use of cattle and swine.

“ GRASS of middling goodness may raise a beast to be half fat; but in that state he may remain, however deep the bite may be: nor does it follow, that the artificial grasses, so fattening on good soils, will have the same effect on lean ones, or those which are not good

feeding grounds: persons ought, therefore, to consider the nature of their land, and not attempt to fatten cattle on soils which are only adapted to store feeding or breeding.

“ Dr. Sloan says, fol. 84, that the Jamaica way of FATTING cattle is to bleed them in the jugular vein, and purge them with aloes. (I have already discussed the *rationale* of this practice.) Nothing cheaper wherewith to raise a fattening bullock than barley meal and chaff (the chaff of good hay.) A stalled ox in winter, kept on hay only, will eat, at least, a load every two months, and may be made fat in twenty weeks. An ox put to grass in good case on May-day, with a full allowance of hay, as soon as it shall become necessary from the decline of the grass, will be fat and ready for market at Allhallowtide, or six weeks before Christmas.

“ AN HEIFER or young cow will make beef earlier than a steer. An old cow, or an old sheep, will not fatten nearly so well with hay as with grass. The combs, or the larger malt dust, two quarts of them being boiled in two gallons of water, and given to an old cow thrice a day, will plump her up in six weeks to a sufficient show to deceive the butcher. TURNIPS do not fatten bullocks well after Christmas, when they become hollow and sticky; they do better for sheep.

“ The aftermath of natural GRASS, far more nutritious than that of clover or the artificial; but no aftermath or rowing of a fattening nature except upon good ground. FRENCH GRASS (*sainfoin*) hay, if cut early in flower, will fatten until towards spring, when it becomes dry and sapless.

“ IN DRIVING TO MARKET, fourteen pounds weight of hay is the constant allowance on the road to every fat beast: this quantity is put into the rack in the evening, to serve night and morning. *The cattle that*

in hot weather come to London in droves, are, many of them, heart-broken, and so heated and tired of their spirits, that if they were not killed, they would die; and those whose feet bear not the journey well, do so waste their juices through fatigue, that when they are killed, they will not stiffen. (These disadvantages are infinitely enhanced by the subsequent treatment of the cattle, in the streets of London, where individuals of them, goaded by the most racking pains, and agitated by extreme alarm, are driven to madness, to the heart-felt delight, not of the drovers only, as has been supposed, but of a beastly and an ignorant rabble of all sorts, to whom it is *a high gratification, to impress with affright and inflict tortures.* From the violent and continued inflammation, the flesh of these animals is given out to the public as food, in a state of absolute gangrene. All this, however needless to the extreme point of ridicule, is borne with that laudable patience, which has ever induced nine tenths of mankind to dread and reject effectual remedies.)

“A young beast may eat well HALF FAT, but an old cow half fat is not eatable, for the whole body of such a cow ought to be filled with new juices. A young cow will be fat on the back, but very rarely, well tallowed within; whereas an old cow seldom handles so well, but generally carries most of her fat within. A two year old EWE will fatten and tallow well. The springing or standing out of the navel, the best sign of internal fat; also, in lean cattle, such protuberance, a sign that they will fatten internally.

“An understanding butcher may gain more money by an ugly mis-shapen bullock, than one whose bones lay well, because those bones that lie ill carry more fat than they seem to do. (I would wish the understanding butcher to contrast that position with another—*A thorough shaped beast will always come*

well to the scale, whereas an ill formed one will seldom reach the weight he is laid to.)

“A beast should have a large HOOF OR FOOT, and large long legs: this is a sign that when he is fat he will weigh well: a spiny-legged beast never pays the grazier so well as the former.” [An unfortunate judgment in Mr. Lisle, but such was the opinion of his day. With respect to the spiny leg, I can agree with him so far, as to be convinced that the aggregate weight of meat will be increased by a proportional size of the bone.]

“A beast should not be LEATHER-THROATED, but have a fine and thin neck, in order to prove well. Should be deep in the gascoigns, which mounts him high in the hinder-parts, and makes him weigh well—wide between both huckle bones, which gives room for his filling—deep in the brisket, or from the upper part of the shoulder to the lower part of the neck, for then he will fill well with fat—short-ribbed, that is, the rib and the flank should meet close: some beasts either want a rib, or have a false rib, which is so called, because it is very little, or lies deep within, which is a great blemish, occasioning the flank to pitch and fall in.

“When a beast is fat, he will shew himself so to the eye, by a roll of fat as big as one’s fist, which, when he walks, moves itself forwards, before his shoulder: such a roll of fat may likewise be seen in his flanks. *Luxuriat toris.* VIRGIL.

“A cow has a good udder, when her teats are at equal distance, and pretty wide asunder; when the teats are near together, there is danger of losing one of them: as the teats ought not to be very small, so neither ought they to be too big; such are called windy teats. When the udder hangs full in leather, and in wrinkles behind, it is an argument the vessel is

large to receive milk, whereas some cows, although they might give ever so much milk, have no vessel to contain it." [This last defect, were it not imaginary, might probably be remedied, by milking thrice a day—but nature generally proportions the vessel to the fluid secreted.]

"In a fair, there may be many LEAN BEASTS, which in shew appear twenty shillings a head better than others, and yet are not, in reality, worth so much as those of inferior appearance; as amongst fat beasts, the lightest in weight, by twenty shillings, may be preferable at the same price. In the purchase of stores, a long and heavy dewlap, or *merry-thought*, hanging down under the throat, a thick jaw, small dull eyes, and thin buttocks, are to be avoided; such do not take on fat kindly, for they are apt to lay it on unequally, *and not on all parts proportionally alike*; a great advantage to the butcher, for then the coarse pieces will sell well."—['On all parts'—here we have, I think the real *utile* of the matter, far more than in our present modish doctrine of laying on fat here, or there, or on the best parts. Equal fatness is not only a great advantage to the butcher, but to the great majority of the public.] "The hide of a bullock should be of a middling substance, for the grain of thick hided beef will be coarse, yet a very thin hide is not desirable. The north country oxen [long horned] are thick hided, nor will they in Smithfield sell so dear as North Wiltshire [meaning, it may be presumed, Gloucester, Hereford, and Western red cattle] oxen: the sweetness of the latter beef is esteemed greater than the former, and will outsell them, one hundred weight in seven." [The same difference holds at present, with the exception of the improved midland county beef.]

"AN HEIFER, that has never been bulled, will not

fatten so well as having received the bull; but if she has had a calf, or has warped [suffered abortion], she will fatten very well without the bull; an opinion, however, which is not general. [Either one or the other will fatten without the bull, and come to a far greater account, provided the needful time be allowed; for although, whilst the desire of the male is upon them, they are stationary, yet it is seldom with actual loss of weight, nor do they eat their usual quantity; the heat being passed, they proceed to thriving. Should the *furor* be extreme, they may be cooled, and the length of the fit abated, by dark confinement and nitrated water.]

“The largeness and fullness of the cod, in a fat ox, is reckoned a great beauty. LABOURING oxen make the best beef, dying more kindly, and carrying more inward fat, than those which have never worked, and as the phrase goes, they divide better in the joints, and piece better under the cleaver, when quartered out by the butcher; whereas, the unworked beef does not so easily divide, and eats coarse and livery.” [Some abatement, perhaps, ought to be made here: the sinews of the labouring ox are enlarged, and more tough than those of the unworked ox, more particularly if worked many years.]

“The HAIR STARING, or erected on the ridge of the back, and the bushy extremity of the tail being thinned, denote the waste of excessive labour. Thick horns or head are disliked, also thin flat ribs. A beast with a thick hide setting loose and in wrinkles, with the hair sticking up, like beggars-plush, will not thrive well.

“The cattle of North Wales and Shropshire do not fatten kindly, on account of their being thick hid—the cattle of North Wales are generally black. But in

Glamorganshire, and other parts of South Wales, they have thin hided cattle, which are much on the *red and brown* colour, of the breed of Gloucestershire, and which fatten very kindly. The more northerly the cattle are bred, on account of the cold, the thicker their hides, and in Leicester, Derby, and Yorkshire, the hide of a large ox [in 1717] may sell for thirty shillings, being thick enough to make ben-leather for the soles of shoes, whereas the hide of a south or western ox, although equally large as the other, will not fetch above fifteen shillings: yet such an ox as the latter, weight for weight, will sell for more money, by two pounds in ten, than the former, because the meat is finer, and the carcase will yield more tallow.

“ To graze cattle in a HILL COUNTRY, these three things are especially to be regarded: first, to raise a good quantity of French grass [*sainfoin*] for hay and aftermath—Secondly, to turn a good quantity of hill country meadow into rich pasture, by seeding, dunging, or otherwise manuring it, in order to make it fit to raise a bullock, in the spring, when he comes first from hay, and to receive him with a vigorous aftermath, when the aftermath of the artificial grasses goes—Thirdly, to have hovels in your bartons [fold yards], inclosed with close court walls, to shelter your cattle in the winter from wind and rain. All these three things are necessary and uniform, and do correspond one with another: without them, grazing must be carried on very defectively, and to little profit, by the hill country farmer.” [Modern improvement has added an useful item or two to Mr. Lisle’s excellent *three things*, to wit, cutting and carrying the summer food, and the root-crops in winter: we ought not, however, in the style of fashionable vete-

rinary gasconade, to boast of these as a matter of late discovery, but to acknowledge, that we have adopted them from former authority.]

“ By the above methods, plenty of sainfoin hay will enable the grazier to buy in lean beasts, in winter, when they are cheap, and if by winter hayning [shutting up] some meadow ground, fed close, but in high condition, you can early in the spring, by April or sooner, have a bite for such beasts, before the clovers are ready, it will be very advantageous—and by hayning up such meads for aftermath, which towards the end of the summer, are in very good heart, you will support your bullock, and carry him on, when the spirit of the other grasses fail—Then, such cattle as are unfinished, being brought to sainfoin hay, and tied up under hovels or coverings, or within court walls, will proceed in thriving by being secured from the wind and rain, and the tedious hill country *rimes*, which often continue whole winter days, causing fattening beasts from grass to pitch [fall away,] and washing them out. Besides, if you have not plenty of sainfoin hay, you cannot in winter make the best of a cow that warps, or of one that, towards the latter end of the winter, proves barren, or of a fat cow, that casts her calf before you kill her.

“ The foregoing cautions unobserved, ill consequences such as these will result.—Your cattle cannot at any time of the year be made fat, as they ought to be, and then, sell them you must, at the buyer's price, half fat, however great the prospect of a sudden rise may be, and you will seldom find yourself paid for the meat they have eat—then if early spring grass be wanted, even if you have plenty of hay, it will not succeed late in the spring until there is a bite of the hill country clovers, and the cattle will pitch before your eyes, yet unfit for market. Again, if early spring

grass be wanting, you cannot begin summer fattening of cattle, nor can buy a barren heifer, till towards the middle of May, a very dear time; and in the hill country for so late a beginning, that summer grass will hardly fatten a beast, the ground generally poor, falling early off its strength—then if you have not a quick growing aftermath treasured up, it is plain you must again run into the first evil—and if you have such an aftermath, you will again often be wanting hay in November and December, to finish summer fattened beasts; so that *plenty of hay is always necessary*. And lastly, though you have both hay and grass, *if you want winter shelter the cattle must suffer.*”

[Mr. Lisle then collects his advice on fattening cattle in the hill country, under a number of specific heads. It ought, however, to be remembered, that sheep and swine are the more appropriate stock of the hill country, where the cultivator had better decline fattening oxen to any further extent than for his own, and the use of his neighbourhood.]

[The GLOUCESTER BROWN were a breed of oxen in the highest repute in Mr. Lisle's days, (from 1690 to 1720) the Herefords, now so celebrated, were then unknown, originating most probably in a Gloucester cross.]

The learned Lisle gravely records, the following rational opinion of his hind, concerning a bull's breath:—In 1711 an ox fell lame in the field whilst ploughing; on the spur of the occasion, they yoked an unbroke bull in his place. This master of the herd belowed up and down the furrow, for two or three turns, but without making any resistance: he ploughed quietly that day and the following, much to his master's satisfaction, who intended to have continued him at work, had he not been deterred by his hind, who assured him the bull would kill the ox he laboured

with, “by blowing on him with his breath, which was very strong:” a Wiltshire discovery, where, for that same reason, they always ploughed with two bulls, in the same yoke. The strength of the breath of bulls, however, presently ceases, it seems, on their being gelt, and three years labour will work out his bullish nature, and he shall then produce beef equal to any ox. An ox does not care to plough, side by side, with either a bull or a gale (bull seg, or gelt bull) until his bullish nature and strong breath be ploughed out; besides, *with their short horns the bulls can easily strike the ox in the face, beat him out of the furrow and tire him, by his endeavouring to use an equal strength to draw sideways, from the bull, or to press forward.*

[Doubtless, had Mr. Lisle given a certain old medical receipt, he would have repeated the injunction *to gather the herb with the left hand, the moon being in her increase.* The bull with his short horns driving the meek and unequal ox sufficiently explains the whole business, leaving the breath of the former to its proper use. Nor ought any one to be assured, that a seg will make beef equal to the best ox beef, by virtue either of three years labour, or of the best keep: but the passage is an old and strong confirmation of the use of the bull for labour; in truth, no bulls need be kept idle. Qu?—how many bulls have we upon the island, and how much may be added to the common stock, by the employment of the major part of them in labour?]

“The north country beasts much exceed ours in bulk and weight; for though we have as deep feeding in Somersetshire, and in the vale of Wiltshire, as they have in the north, yet because we work our bullocks, that stops their growth; whereas in the north, they plough with horses, and keep their bullocks unwrought, till they are fatten and killed.” [This is a curious

specimen of the facile and current mode of settling general principles in rural affairs: the truth is, that the northern beasts he alludes to, were and still are, *specifically* larger, in growth, than those of Somersetshire, whether they have laboured or not; and farther, that the laboured ox generally fattens to the largest size, age being equal. Probably Mr. Lisle had, without reflection, imbibed the notion, that “all breed goes in at the mouth,” and that keep levels all size; and being at a loss to patch up a flaw in his theory, opportunely stumbled upon the idea of labour.]

“The CLAWS of working oxen grow larger and broader than they otherwise would do, therefore a broad full claw is a sign that the ox has been a good working beast, bearing hard upon the ground, which has caused the horn of his claw to expand. Oxen, previously to being *cued* [shod,] to be tied upon some dung heap, or in a moist place, to supple their claws, that the nails may drive more easily. This practice may be continued in the stall, since their feet are generally tender after shoeing, whence also, it is beneficial, to favour them, for a day or two, at least not to work them on rough and stony ground, or in the woods, where their shoes are liable to be torn off by the stubbs. Oxen turned off to rest, ought to be fresh shod, as a preservative to their feet, and a promotion of the substantial growth of the horn.

[Often washing with water, warm if need be, or rather suffering the feet to remain immersed in water, a considerable length of time, and frequently, is the proper method to render the hoof supple. In this particular, of no little import, [whether for horses or oxen, both for the legs and feet] the French veterinary school sets the best example, which we have, hitherto, followed tardily, and without sufficient patience. It is surely good practice to turn off either horses, or

oxen, with shoes, when there is either a danger of breaking their hoofs from the hardness of the ground; or of rendering them too relaxed and soft, from its wetness. The feet of oxen should be well washed and cleaned from all dirt between the claws, after labour. I have already hinted that there is room for improvement in the shoeing of oxen, which is said to be more particularly apparent in their labour, on the road, where, in long journeys, their claws are liable to distension and strain. The ancients did not shoe their oxen, but tarred the bottoms of their feet, and between their claws, as a preservative. It is recommended, as more profitable, instead of a boy, to employ an able man to drive the oxen at plough, and even for the ploughman and driver to change hands, in the course of the day, as a change of voice will make them ‘*go trig*,’ and quicken them. I wonder it did not occur to Mr. Lisle, that a quartern of corn each, might possibly have a superior effect in making his cattle go trig.]

“ In 1719 he was inclined to dispose of his two OX-TEAMS which he had used many years, because they were so chargeable to him, in hay and vetches, but was persuaded by a farmer, to keep at least one of them, and to work them moderately upon straw only, in winter, from nine in the morning until two o’clock, which, it seems, was to get them a stomach to their meat; but the practice was not to be continued longer than the age of seven years at farthest, since aged cattle thrive not well upon coarse meat.” [His teams of oxen consisted of six and four occasionally; had he reduced the number to one half, in each team, and fed them with hay and corn, as horses, it is probable, his solicitude on the matter would have ended.]

“ Nothing in winter beats out cows and oxen, or makes them pitch [anglice, fall away] more, than their being WET ON THEIR BACKS AND LOINS: for cattle

carrying their hides wet, day after day, is as bad to them, as it would be to us, to wear wet clothes; same injury arises to poor, straw-fed cattle, working in wet weather, one day's work in such, harming them more than three of equal labour, in dry weather. On this account, his cattle were put under pent houses, in bad weather, where, although exposed to the air on one side, they were kept perfectly dry and safe. House your cattle dry, and wait not for the winter rains.

“BARLEY CHAFF improper for oxen, being apt to stick under the root of their tongues, an objection which does not lie against the chaff of wheat and oats. WINTER VETCHES, good to mix with, and qualify the cold and washy aftergrass. In the hill-country, it is necessary to the well-doing of oxen, to have a rick of good old winter vetches [tare hay] in store, for their use in July, when probably all the natural grass may be burnt up, as they cannot bite close like a sheep, and since there may be no fresh grass springing until after the rains in August. Green tares, at that season, said to scour and make oxen sick, although they agree with horses.” [This difference arises, probably, in that horses are more usually allowed dry meat of some kind, with their tares.]

“In a cow a broken mouth or pot-belly, the certain signs of old age, then unfit for any purpose but grazing. Straw-feeding, particularly on cold or hilly land, hastens the old age of cows. Under such circumstances, it is not profitable to keep cows beyond six years of age.

“FREE-MARTEN known by her BEARING [*prudendum*] being drawn up like a purse, and not turgid, like that of the breeding cow, her head coarse and open, ox-like horns, small udder and teats. Her beef is worth more by a halfpenny per pound than that of a cow, and she fattens kindly, approaching the ox in size. The an-

cient Romans knew the free-marten, calling her *taura*, and yoked her with their oxen.

“ In a cow which has not taken the bull, or which has not gone through [not succeeded,] the bearing will be firm and turgid, whereas being in calf, her bearing shrinks and grows lank, afterwards again growing turgid about two months before calving.

“ Captain Tate of Leicestershire, observed to this author, in 1706, that notwithstanding their Leicester-shireland was richer than that of Lancashire, they could not keep up the Lancashire breed of cows and calves, but they would so degenerate, that in the third descent, *they had their Leicestershire breed again.*” [This is the old story, perhaps, in one of its early editions, to which I have before adverted, particularly in the case of pigs (see *Farmer's Calendar*) : however, Mr. Lisle gives a very sufficient reason, in the then superior keep and management of Lancashire, where, so many years ago, they weaned with pure milk, and gave eight or ten pounds for a yearling bull calf, which were, at that age, large and forward enough to serve the cows. Here we have a good proof of the original district of the celebrated LONG-HORNS, beside too many evidences, at this day, that the Lancastrians have degenerated in respect to their ancient attention in cattle breeding, their brethren of the midland counties advancing in proportion. *Om. re. vicis.*]

“ A notable Wiltshire dairyman assured Mr. Lisle, that he never did, or ever would, stock a cow upon sale, nor use any of the common tricks to prevent her calf from sucking, nor would he purchase a cow which had been set off in that way, from the well-grounded suspicion, that such manœuvres must necessarily be intended to hide some defect. He observed, that nevertheless, his cows sold as well as those of other people's. [I have elsewhere described and remarked

on the impotent attempt at deception in this barbarous and useless cow-jobbing practice. To stock a cow, previously to sale, is to suffer the animal to remain unmilked, one or two days, perhaps longer, that her udder may be distended to its utmost possible capacity, in order to make a great shew of *tackle*. Now, as the custom is notorious and acknowledged, it can deceive nobody, yet the jobbers fail not to practice it, even among themselves. All buyers for their own use ought to set their faces against a custom often productive of inflammation, and its consequent ill effect upon the cow's udder.]

“The rank and foul food sometimes given to the LONDON cows, Mr. Lisle was informed, would rot them in two or three years, if they were not sold off fat, in that time.

“Cattle, well SUMMERED, are half WINTERED, that is to say, cattle going to straw ~~yard~~, in high condition, will preserve a good plight throughout winter; whereas, such as have been fed upon short commons during the summer, and go to straw in a weak condition, are liable to become worse, or even to drop off in the winter season, particularly if it be unfavourable. Very young cattle and old cows, are the most dangerous stock under these circumstances.” [To the above well-grounded position may be added—Cattle well wintered are half summered: they are able to encounter either extreme of rank and surfeiting, or of low summer keep, with greater safety than weak and starved cattle.]

“Cows will eat a prodigious quantity of HAY, the exhaustion of milking increasing their appetites, to almost double the capacity of those which are not milked. A cow will consume as much, probably more hay, during winter, than a fattening ox of the same size.

“The spring [1714] proving cold and dry, there

was no prospect of a swarth of sainfoin, so the labouring oxen, and the milch-cows were turned into it, and found a noble bite, but it turned out, that the cows did not milk so largely, as from broad clover, nor were the bullocks so able to labour: yet broad clover, from its bitterness, is said neither to make good cheese or butter." [This memorandum is of consequence, a very different opinion having been held of late, perhaps with little reason.]

"VETCHES, an excellent cordial for cows which calve in winter, or in early spring. Cows said to take such COLDS in calving as to have rheumatic pains in their bones, a long while after, so as to set a leg forward with difficulty; repeated doses of two quarts strong ale, with plenty of toast recommended.

"In retention of the CLEANING (*placenta*,) the countrymen give a cow *rough* barley, on the supposition that from its roughness, it has a mechanical effect in expelling the after-burden. The virtue consists in the nutritious power of the barley. The cleaning not coming away, but hanging from the cow, weakens her, and her straining brings on running of the reins, coming from her like the white of an egg. Unless a remedy be found, she will sink, and not recover her flesh. A handful or two of *mistletoe* said to be a remedy.

"Where WINTER PROVISION is insufficient, it is most advantageous to dry your cows, immediately before you put them to straw, and to fodder them where they may have fog or winter grass. Give the LONGEST fodder in wet weather, because the cattle will be more apt to trample upon and waste the short. Cows do not thrive so well entirely confined to the house, as having the range of a well-foddered yard.

"Heifers will TAKE BULL sooner from a bull going with them: young ones liable to be injured by a full

grown or heavy bull; instance of one having her hip dislocated by the weight of the bull. Yearling bulls frequently preferred on that account. Heifers taking bull very young, and bringing a calf, are sometimes liable to miss the next year.

“ A cow having gone twenty weeks with calf, if one press with the hand, against the flank, on the right side, with a swift motion, the calf, about the size of a ball, may be felt beating against the hand: until the calf be twenty weeks old, or thereabouts, it lies up high under the flank, but, on growing larger, descends, and then one must feel lower for it; and a second person being on the other side the cow, to push the flank from himself, it will assist him who feels, when the cow is very young; by the hardness and size of the calf, is to be judged how long the cow has to go.

“ The UDDER of a heifer springs [suddenly distends] sooner than that of a cow, remaining in that state a longer time previous to calving, perhaps to the extent of a week; whereas a full aged cow may not wear that appearance above a day or two.

“ A heifer will not, when she is half gone, so easily discover herself to be with calf as an old cow will, because the sides of the latter fall in more; in judging of a heifer, therefore, one may often be mistaken. When the cow has gone half her time, the calf preys upon her and she wastes, and although she may be in flesh, and fit to kill within three weeks of her time, yet she will be much impaired within, and in her tallow, nor will her flesh spend so well.

“ SWINE should never be suffered in a fold yard with cows, because burrowing holes in the straw, the incalf cows are liable to overlay themselves by night, in such hollows, and being unable to rise, they may perish before they can be seen and assisted.

“ A cow should never be TIED UP in the house, when

she is soon expected to calve, since being unable to assist or lick her calf, it may be smothered in the discharge, or the dung.

“ A cow that is liable to WARP [miscarry] should be dried, as the best remedy. Cows that GO THROUGH [miss conception] will be bulling every three weeks of the season, and by riding the in-calf cows, often *squat* or kill the calf, with their knees striking the cow's flanks.

“ If a cow CAST her calf, you must let part of her bag, that will hang down behind, continue so till it rot off; for if you pull it off, you will be apt, with it, to pull away what you ought not. Should she warp three months, or one month before her time, she may, nevertheless, milk well.” [The bag hanging down behind, as the author calls it, is the cleaning, or after burden: under this circumstance, the cow should be removed from the herd, to a safe and warm place, if needful, where, if she do not soon *clean*, the proper remedies should be applied.]

“ Spreading in the pasture the SOIL OF PONDS and ditches, it is averred, will occasion cows to slink their calves.

“ Cows liable to DIE IN CALVING during the dog days, as the heat excites them to glut themselves immediately with cold water. Hay to be given them before they are suffered to drink. The greater care demanded by a cow in high condition, as more liable to inflammation. The care respecting water to extend to several days after calving, the drink to be dispensed frequently, but warm and in small quantities. A bull calf and a pur lamb come a week earlier than the females. [A strange mistake of the author surely; it is probable, the females of all animals come first.]

“ The excessive cold in June, 1699, universally affected the horses and cattle. The cows at Lough-

borough fell off their milk, which turned salt, as if they were near calving, and the farmers did not expect an amendment until the next calf.

“ To repel, or DRY AWAY MILK, it is recommended to half milk the cow two or three times, and anoint the udder with tar. Also if the milk return, and irritate the cow, whilst she is at grass, drenches of a pint of verjuice, at two or three days distance, are directed. [I apprehend the verjuice would be more safely and effectually bestowed upon the udder, than internally. Clarke, one of our veterinary writers of reputation, relates that a horse was killed by a drink of a pint of vinegar.]

“ Cow to be DRIED within two months of her calving, as, to milk her longer, most certainly impoverishes both cow and calf, to a far greater amount than the value of the milk. All young animals well kept, are the better for it ever after; heifers come to the pail earlier from it, and bullocks fatten earlier. Instance of hog lambs sent at a good price to be kept in rich pasture, through the winter, by which the owner was paid double.

“ The FIRST CALF of an heifer best for rearing; the reason alledged that the cow could not be reduced by milk during gestation. LATE FALLEN calves, in May or June, never so hardy when grown up, or bear the winters so well as those dropped in March: the chief reason of this is because late fallen calves must be weaned late, and as they always pitch, or fall away a little on weaning, the approach of winter prevents their recovery. Nothing afterwards can make amends for the defect of the summer's sun to invigorate their tender growth; and not acquiring that strength of *stamina* and bodily firmness, so necessary to resist the access of cold, they are ever bad winterers. Generally these late weaned cattle do not shed their coats so early,

by several weeks, as others, and may be seen with the russet winter hairs on their backs, in June: such condition may, however, be also the result of hard winter keep. [This rule of the excellence of early breeding applies equally to all our domestic animals, including poultry. The necessary caution in the case, is to shelter all young animals, during the severe and variable weather of early spring. I have known a farmer suffer his mares and foals to wander about a common exposed to the north east winds, until they were fairly and foully glandered, for no other reason than because he had always used to do so, and as he supposed, with impunity.]

“ CALVES weaned at three days, or immediately after having drawn away the *beestings*, will not be apt to suck each other, or the cows. Preferable to feed each calf by itself, with a prescribed quantity, *e. g.* three pints at first weaning, gradually increased to the maximum of five pints. If fed in troughs together, the point of cleanliness apt to be neglected, and the calves to rob each other. A calf may be weaned at a month when there is grass; it is better to continue their milk awhile, and if the grass scours the calf, a small quantity of salt in the milk will prove a remedy; also hay.

“ No calf, lamb, or other animal should be caught and held by THE TAIL, as it strains and inflames the loins and kidneys.

“ No VEAL, it is averred, can be white until the calf be a month old, from that time it begins to whiten.” [We may observe how modes of practice, right or wrong, are continued. It has been observed of a Gloucestershire farmer, that he gave his calves their milk *scalding hot*; he probably learned it from Lisle, who derived his authority a century since, from the good wives of Leicestershire.]

“ In Gloucestershire, where the cows gave much milk, it was said to be a good HOUR’S WORK for a woman to milk six, but that no woman could milk more than eight per hour. Cows begin to ABATE of their quantity of milk about the blossoming time of wheat, until the flush of after grass, when an increase of milk returns for a time, until the cold of autumn and decay of the grass occasions another abatement. [The flow of milk returns on the cows entering the fold yard, which is well provided with the winter crops.]

“ The *colostra*, or BEESTINGS, always to be milked clean away, or its absorption will injure the cow. When a cow looses her calf, it is common to put a strange calf to her, to suck away the beestings, which, however, generally purge and reduce the calf; it is far better to draw away the first milk by hand, nor should a calf be put to that duty, but in the case of danger to the cow, from her retaining the milk.

“ PROFIT OF A COW in the Isle of Wight in 1698. Rent of a cow 45s. average quantity of milk, 2 gallons per day, each cow, which quantity produces 4 lb of butter per week; a cow yielding 70lb. from June to Michaelmas to be potted, in value 23s. 4d. with 1 cwt. skim milk cheese at 1½d. per lb. besides which, there is the May butter, since they do not pot until June. The value of the calf 16s. and the whey towards the maintenance of a pig.”

Compilers of cattle books repeat one after the other, that ‘ the best English oxen and cows for largeness and neatness of shape, are bred in the counties of York, Derby, Lancaster, Stafford, Lincoln, Gloucester, and Somerset. Those bred in Yorkshire, Lancashire, Derbyshire and Staffordshire, are *generally black*, with large well spread horns: those of Lincolnshire are, for the most part, pied, very tall and large, and fittest for labour: those bred in Somerset and

Gloucestershire are generally red, *and for shape* much like those of Lincolnshire. Wiltshire breeds large cattle, but with ill shaped heads and horns.' Not having Fitzherbert's book by me, I have been unable to trace this account farther than Gervase Markham, whose first publication was in the reign of Elizabeth, or early, in that of James. Numberless writers, even as late as within very few years of the present time, some of whom, one would have supposed more conversant in the existing state of things, have copied this account of Markham verbatim. Markham says, these black cattle had 'exceeding large horns, very white, with black tips, and they whose blackness is purest, and their hairs like velvet, are best esteemed.' He represents them 'stately, big round, and well huddled, short jointed, comely to the eye, and esteemed excellent in the market.' This breed, extinct in the counties he mentions, was probably the same we find, at this time, in some parts of Scotland and Wales. His description of the Lincoln cattle does not ill suit those of the present day, 'their horn little and crooked, of bodies exceeding tall, long and large, lean and thin thighed.' Thus it appears that Lincolnshire possessed the short horns earlier than the more northern counties. His strange comparison of the Lincoln with the western cattle, arose most probably in his want of a practical acquaintance with the animals he was describing.

ELLIS OF GADDESSEN, Herts, a farmer of extensive practical knowledge, and one of the most intelligent and most free from prejudices that any country has bred; unlearned, but a voluminous writer. Passing through Gaddesden, about the year 1790, no one whom I met had known, or even ever heard of Ellis, so well known in his day.

"WEANED CALVES. Good keeping the first year is

the way to have them a year forwarder than those kept on straw. A calf weaned in April will *wrinkle* on the horn a year sooner, than one weaned late in summer, and take bull a year sooner. Cows suffering from long drifts and sore feet, will be deficient in their quantity of milk, though fed in the best pasture. One acre of CLOVER cut and carried to cattle, is thought to go as far as six of natural grass fed in the common way, and as far again at least as clover fed with beasts in the field.

“ Ellis could never find that a cow would SUCKLE and fatten above three or four calves at most, beside her own, in one year, and then the gain would be but about £5.; for a cow is a great devourer of hay in winter, and will easily eat from one and a half to two cwt. in a week. [Much more than this may be done with deep milkers and small sucklers, the cows being fully supplied with succulent, as well as dry meat.]

“ By the Irish DAIRY ACCOUNT a cow yields three gallons of milk per day, for the first ninety days; for ninety days more, one gallon; for ninety more, scarcely one quarter gallon; for ninety more, dry. [More than fifty years since.]

“ By the vehement lugging and drawing the milk, by large strong calves, the cows are not so prone to take bull, as when milked. Twenty two gallons, or 176 pounds of cream, yield about 70 pounds of butter.

“ A person of note, in Gloucestershire, said he could FATTEN an OX with CARROTS as much in one week, as common meat would do in four.

“ No green vegetable produces more milk, nor fats sheep and bullocks sooner, than RAPE, COLE, or KAIL, and that in the severest cold winter or spring, only particular care must be had, this food being so apt to *hove* them. It is by the help of this food, that the winter suckling of calves may be carried on to the

greatest perfection. This one example, among many, discovers the ignorance and bigotry of our British farmers, who, though they have heard of the improvement of field coleworts, for more than forty years, yet would never be brought to sow the seed, in our chiltern country, till within these very few years past. Cattle not to be turned into rape, as they are apt to tear it up by the roots. The heads to be cut off, which will sprout again."

"YOUNG'S SIX MONTHS TOUR. About forty years since, Charles Turner, Esq. of Kick Leatham, Cleveland, Yorkshire, made two comparative trials of the merits of the Lancashire long, and the Yorkshire short-horned cows, the result of which was as follows:—From 52 quarts of milk given by the long-horned cows, a cheese was made 3lb. larger than another made from 58½ quarts of milk given by the short-horned cows.—From 22 quarts of cream, from the milk of the long-horned cows, 20lbs. of butter were made, 22½ oz. to the lb. but from 20 quarts of cream from the short-horned cows, only 15lbs. were made. [From my own observation, I apprehend the result of such an experiment would be similar at the present time.] For grazing, Mr. Turner preferred the long-horned cattle, as quicker feeders, and found a difference of £20 between wintering 30 short-horned, and 30 long-horned beasts, in favour of the latter. He was at much trouble and expence in procuring a dairy of the true Lancashire long-horned cows, their pedigrees being investigated with almost as much care as those of race horses. His first bull cost him forty guineas, and fifteen cows, twenty guineas each; for two of which Mr. Bakewell offered him sixty guineas.

"OX TEAM. A waggon with horses being set in a village, and Lord Waltham's ox team passing by, accidentally, the horses were taken off after much

rallying, and the oxen clapped to, which, to the amazement of the beholders, drew the waggon out in triumph. *At that time* (about 1767) the Essex farmers would as soon have believed that oxen could speak as draw. Near York, it was asserted by those who used oxen, that two oxen are much stronger at a draught than two horses, and will carry out a much greater weight. [Utterly improbable.] Four horses driven at plough with reins by the ploughman.

“SIZE. Mr. Mackie, in a Letter to Col. Dirom, gives account of a comparative experiment of fattening large and small oxen on turnips and hay, in which, each large ox ate double the quantity consumed by a small one. On sale, the large fetched £12 each, the small £8. [Nothing is here conclusive on this complicated subject: Mr. Mackie’s theory on the form and fibres of the animals, still less so.]

FIR TREES. A correspondent of Dr. Anderson in 1782 says, ‘I was so pinched last spring for provender to cattle, that I had not a stone of straw or hay, from the middle of March; nothing but whins and oats for horses, and fir tops (that is, tender shoots of firs) for cattle; and I had 430 horned cattle, and about 120 horses, small and great, of which I lost but a few (four or five, I cannot tell which) cattle; but there were numbers of cattle that died in this country for want. Some tenants lost one half of their cattle, and some almost the whole.’ As many branches were lopped from the trees as would subsist the stock of cattle for the day, as they ate not only the leaves and smallest twigs, but even gnawed down the stumps to the size of a thumb. The cattle continued in perfect health. In 1786 (Vol. V. *An. Ag.*) the Lord Viscount Townshend applied PLANTATION THINNINGS to like purpose, and with equal success. Some of the sheep which *scoured* were recovered by the use of the trimmings

and the bark. Sheep, cows and bullocks, ate the leaves and small twigs, deer the bark only. They prefer the trees in the following order: first ash, next Scotch fir, oak. Beech, birch, sycamore, spruce fir, and larch, they seem to dislike. His Lordship's letter is full of useful practical hints respecting plantations.

A writer several years since, upon what authority I know not, made a computation of the neat cattle, in this kingdom, according to the following round numbers—One million of BEEVES in keep. Two million of MILCH COWS. Two million of CALVES.

The following calculation of the INCREASE of neat cattle, is extracted from an old author, who has sketched out a regular table, which I have not leisure to transcribe. By this table it appears, that beginning with ten cows, having by their sides ten cow calves, and supposing afterwards, an annual equality of males and females, losses and failures excepted, the increase in TWELVE years will be 1777 head, of which, 486 will be milch cows, 243 cow calves, and 243 steers and oxen. The increase in twelve years, from a stock of 50 cows and calves, according to this rule, would be 5789 head. Such calculations, matter of mere curiosity, necessarily proceed upon the ground of every female being preserved for breeding, and of the cow calves taking the bull early in the second year; yet with every deduction of allowance for casualties, a wonderful power of increase in a few years is demonstrated, forming a comfortable prospect in extensive and newly-settled countries, where, to raise a stock of cattle for subsistence and the convenience of human life, must be so great an object. Speculations like these, out of place in Old England, may be entitled to a considerable share of attention at Botany Bay, whither, I hope, this book, not its au-

thor, who is too old for travel, will be speedily transported.

“ Parve, nec invidio, sine me, liber ibis——”

“ **HEREFORD BULLOCKS.** This breed, so celebrated for producing quantity of beef, indeed ‘the crack’ of the present day, seems to combine all the desirable qualities,—length, depth, substance, rotundity, fineness, yet sufficiency of bone. From seeing a very beautiful and complete shew-ox, about the year 1797, which they called a Hereford, I was first led strongly to suspect, that the Hereford had, at some period, received a northern cross. My opinion has lately been confirmed by a Herefordshire farmer, who informed me, that, about fifty years since, a Mr. Gallier, of the Grange, near Leominster, procured a red bull from Yorkshire, with a *white face*, and rather wide horns. He bred from this bull, and the produce becoming fashionable in Herefordshire, actually laid the foundation of the present famous breed and thence, it seems, the bald face of the Herefords is derived. My informant farther imparted to me a late and very commendable resolution, in the Hereford breeders, *to cross no more*, but to adopt the midland county system of breeding and improving solely from their own native stock. Conjoining beef and labour, they stand doubtless upon the summit.

“ **COW WEED**, or *Ranunculus aquatilis*. The Rev. James Willis, of Sopley, near Ringwood, Hants, gives the following account of this aquatic plant and its use, in the Annals of Agriculture. The cows of the cottagers are fed with it, night and morning, procured from the river Avon. It is cut daily from the side of a boat, with a hook resembling a common reaping-hook, but much larger, and fixed to a handle ten feet long. This must be very dexterously used, in cutting the

weeds which grow in the bed of the river, otherwise the rapidity of the stream quickly disperses them, and the man's labour is in vain. The weed grows in the river Avon throughout the year: the cows are permitted, after feeding on it night and morning, to range the wide expanse of heath, which they very readily eat, returning to the cottage to be fed and milked. The heath qualifies the laxative nature of the weed, and keeps the animal perfectly sound. The milk and butter have nothing peculiar in appearance or flavour. Produce of milk, on the average, 5 quarts in the morning, 3 in the afternoon; of butter per week, 4lb. each cow, inferior to grass, but superior to hay or straw butter, and fetching the best market price. Sort of cow small, and lately crossed with the French or Norman, the best kind, in Mr. Willis's opinion, either for a rich or a poor man. Soil on which they feed, a very poor black sand, covered with common heath, and absolutely in a state of nature.

“ In the 5th Vol. of the *Linnean Transactions*, we find this plant and its uses described by the late Dr. Pulteney, who says, that in the district just noticed, both cows and horses are almost wholly sustained upon it; its acrimonious qualities evaporating entirely on drying. [Is it then made into hay?] The cows relish it so highly, in its green state, that it is thought unsafe to allow them any more than 25 to 30lbs. per day. One man kept 5 cows and 1 horse so entirely upon this plant, and what the heath afforded, that they consumed only half a ton of hay throughout the whole year. This ranunculus is generally nutritive, and hogs improve upon it, as upon clover, and may be well sustained with it, until they are put up to fatten. It is a very common plant in most rivers, rivulets, and stagnant waters, during the early part of summer, and may become of great use in many

countries, where hitherto it has remained unknown or unnoticed."

SHEEP.

THE SHEEP, as the ox, is of the order of *pecora* or ruminants; namely, of such cattle as chew the cud, and its genus is by naturalists divided into ten species. The generic character—with or without horns; the horns hollow, wrinkled, turning backward, and spirally intorted. Front teeth eight in the lower jaw, in the upper, or canine teeth, none.

After having styled the cow the most useful of all beasts, inclining to each, as it presents in turn, we know not how to forbear bestowing the same attribute on the sheep, in all respects, so important and interesting an animal, which both feeds and clothes us, indispensibly ministering to the most difficult parts of agriculture. The flesh of the sheep is an universal viand, that of the upland and mountain sheep, an exquisite dainty. His fleece is equally contributory to the purposes of simple utility, and to those of the most refined luxury. Wool serves to keep the body of the labourer warm, and to cherish and adorn the person of the prince. It serves to a still higher purpose; it furnishes the exhaustless labour of millions; that labour, which feeding and supporting population, forms the truest base of human society.

The immense consequence of our woollen manufacture may be estimated by the following calculations extracted from Ellis. "One pack of wool, made into broad cloth, will employ fifty-eight persons for one week, who will earn £19. 8.—One pack of long combing wool in fine stuffs, serges, sagathies, cam-

blets, &c. 158 persons, who in one week will earn £33. 12.—One pack of wool in stockings, &c. 150 persons, one week £55. In the whole, 366 persons in one week, will earn £108. in manufacturing three packs of wool." In Ellis's time it was computed, that Great Britain produced yearly 500,000 packs of wool, and Ireland 300,000, at 240lb. each, in all, 800,000; out of which, allowing for home consumption in Ireland, 100,000 packs, there remain wrought up in Britain 700,000. Both the growth and the manufacture of wool since Ellis's time must have immensely increased, but to what extent, I have not documents before me, at this moment, to ascertain.

In an agricultural view, simply, the importance of sheep is extreme; since by their assistance alone, thin, barren, upland soil, so often the far greater part of a country, can be cultivated to advantage, or even generally cultivated at all. The sheep will subsist and multiply on those barren soils, where no other animal could be maintained to equal profit: he is equally calculated for the most deep and fertile, challenging competition, and dividing the palm of profit with the ox, and is excluded from such only, as abound in stagnant water, the moist exhalations of which are naturally destructive to his constitution.

The sheep has been highly improved in this country, both in respect to the value of the carcass, and the wool, and is proceeding with gradual, and by no means tardy advances, towards the criterion, which, according to our present ideas at least, may be esteemed that of perfection. Our long-woolled stock, on which chiefly the hand of improvement hath hitherto operated, may, in all probability, be said to touch already on this point. It is not easy to conceive, that a greater quantity of long wool and mutton per acre is at all attainable, than we have, at this instant, in

our power to attain, from an union of our best new Leicester and Lincoln stock. This advantage has been compassed within ourselves, and independently of any late foreign recourse; but it is far otherwise with our short, or clothing-wool sheep, a species perhaps not originally indigenous in any part of Europe, and which, for certain reasons, has been most unreasonably neglected in this country: our natives of this kind have been hitherto little more, in general, than half bred; it has been therefore absolutely necessary to recur to the parent stock, which for ages has been preserved, in original perfection of blood, in Spain alone. The Spanish cross in former days, introduced, but in an occasional, desultory, and imperfect way, has, of late, been applied permanently and effectually to our short-woolled stock, and with a complete success, which, although so much doubted, was perfectly on a level with common sense, and even ancient experience. The foundation of our independence on foreign countries for a supply of fine wool is thus gradually and happily forming, and the æra of our full attainment of this national object, may not be very distant, or may even be accelerated by the intervention of some wholesome difficulties to stimulate us to exertion.

Our remaining objects of improvement in the sheep husbandry, are—AN UNIVERSAL EXTENSION OF THE MOST PRODUCTIVE BREEDS; A REFORMATION OF OUR WINTER SYSTEM, BY WHICH, AT NO OTHER CHARGE THAN THAT OF PROVIDENT CARE, A VAST ADDITION MIGHT BE MADE TO THE NATIONAL STOCK OF MUTTON AND WOOL, IN THE PRESERVATION OF THE LIVES OF NUMBERS WHICH ANNUALLY PERISH BY NEGLECT AND EXPOSURE, AND IN THE IMPROVEMENT OF ALL; A GENERAL SUBSTITUTION OF THE FULL-BRED FINE-WOOLLED SHEEP, FOR THE HALF-BRED SPECIES AT PRESENT KEPT, AND AN EXTENSION OF THE

FORMER UPON OUR LIGHT SOILS, TO THAT DEGREE, WHICH MAY ASSURE TO OUR MANUFACTORY OF FINE GOODS, AN AMPLE AND CONSTANT SUPPLY.—TO WHICH OUGHT TO BE ADDED, A TOTAL AND SWEEPING ABROGATION OF THOSE COERCIVE LAWS RESPECTING WOOL, WHICH ORIGINATED IN THE SELFISH, BUSY, AND MEDDLING FOLLY OF BARBARISM AND IGNORANCE, AND WHICH IN THE EXTENSIVE VIEWS OF IMPARTIAL REASON AND JUST LEGISLATION, ARE AS USELESS TO OUR MANUFACTURING, AS THEY ARE HURTFUL AND DEGRADING TO OUR LANDED INTEREST.

The date of the original domestication of sheep, and the business of the shepherd, I apprehend to be so buried in the profoundest depths of antiquity, as to be far removed from the reach of any existing records. The little we derive from the ancients on the nature, management, and varieties of the sheep, is vague and inapplicable, affording us very slender assistance towards forming a judgment of their respective merits. Columella tells us, that ‘a fat and champaign country sustains tall sheep; a lean and hilly, those which are square and well-set; a woody and mountainous, such as are small. *Covered* cattle find very convenient pasture in meadows and level fallows.’ This account has been copied by all our early English writers, and by not a few of the late, and applied to their own country. It is curious, however, to observe, that the idea of large stock being required by a rich, low country, is as ancient as the time of Columella. He proceeds to enumerate the breeds most esteemed, which were the Grecian, Tarentine, or covered sheep. They were so called from Taranto, now Naples, whither, probably, they were first imported from Greece; and *covered* sheep, with like probability, from the closeness and thickness of their fleece, in contradistinction to the coarse, long and thin woolled, or hairy

sheep of those countries. The Asiatic were also covered sheep, and in high estimation, for the fineness of their wool, which, from its bright reddish colour, was styled *Erythræan*. These Asiatic and Grecian sheep were no doubt the original fine or clothing wool species, with which the rest of Europe has been since supplied by Spain, that country having derived this invaluable race of animals either from Naples, or from their indigenous country. It appears that covered sheep were kept at Cadiz, in Spain, by the elder Columella.

The Milesian (Carian, Asiatic) and the Calabrian and Apulian, were early distinguished for their goodness by the Roman shepherds; but in Columella's time, those of Gaul and the Altinian (Venetian) variety had the preference. The elder Columella imported certain wild and fierce rams to Cadiz, of a wonderful colour, and on account of their colour, it should seem, crossed his covered, or fine-woolled ewes, with them; but the produce were of a *rough and bristly* fleece, which however was remedied, and the fineness of the wool recovered, after a number of intercopulations with the flock, in which, it may be rationally supposed, the blood of two or three rams was merged and lost. Here we have the clearest refutation of the African origin of Spanish fine-woolled sheep.

According to Columella, sheep are divided into two species, 'the soft and delicate, and the rough and bristly.' On horns, as a mark of distinction, he lays no stress, barely noticing that there are both horned and hornless sheep. He counsels never to use any other than a white ram, if white wool be the object, for even a white ram may produce tawny lambs; whilst white wool is never generated by a red or black ram; which is, on the whole, useful, but partial rea-

soning. The idea of the old bucolical writers, that the tongue and palate of the ram being black or spotted, although his fleece may be white, he will produce black or coloured stock, is generally true; yet in many, perhaps most instances, we observe that the mixed colour will go no farther than the face and legs of his descendants. The white-coloured wool was, by the ancients, esteemed, as in the present times, the most profitable, and for the same reason—‘because of it very many other colours are made, but this is not made of any other.’ They had black, brown, and red-coloured wool, in greater variety and plenty, than we choose to have at present.

To speak of the whole genus, as found in all parts of the world, the grand distinctions of sheep, in point of utility, are into the long, the short woolled, the hairy, and the intermediate varieties, or those which have a mixed covering of both wool and hair. There seem to be no other characteristic marks of much consequence. Both the horns and ears vary in different species, but such variations exhibit no decisive mark of utility. The ears are indifferently erect or pendulous. Some breeds have a number of horns, a spiral and perpendicular one rising from the centre of the forehead. In the Spanish breed the rams are horned, the ewes polled or hornless. But in this respect the more general division is into the bicorned, or those bearing two horns, and those without horns: nearly all the large, long-woolled breeds are hornless; at the same time, many, or most of the small and fine-woolled varieties are without horns.

Europe and the more temperate parts of Asia have always produced the wool-bearing sheep. The finest wool is the growth both of the warm and genial Asiatic clime, and of the rigid northern clime of Iceland: the difference between the fine fleeces of the

north and south is this; the former, although equally fine, is not so elastic, and far inferior in quantity; it is produced on a bed of hair, from which, in shearing-time, it is pulled without either pain or injury to the animal, the hair remaining as a future defence to the carcass, from the severity of the climate. In fact, the covering of these small northern sheep may, with equal propriety, be classed with the fur as the fleece. Africa produces hairy, rough-coated sheep, the covering, in some parts, being long, and apparently partaking both of the nature of hair and wool. The aboriginal sheep of America bear a very distinct character, yet indubitably appertain to the genus. They are called in the language of the countries where they are bred, in Chili and Peru, *Huanacus*, and serve to carry burdens; there is a variety of them inferior in point of size and strength, called *Vicunha*, but greatly superior in respect to their fleece, which is a most precious commodity.

To make a brief and expeditious, yet universal shepherd's tour.—GREAT BRITAIN and IRELAND produce the best shaped, and most weighty carcasses of mutton, the flesh of which is perhaps superior, both in respect of nutriment and flavour; the superiority of these countries is equally decisive, in the article of long wool, whether as to its quality or the quantity grown per acre. Throughout the whole continent of EUROPE, the sheep genus branches into varieties nearly similar to our own; whilst the improvement of their fine wool, through the medium of the Spanish cross, has been pursued during a long course of years, with an ardour hitherto unknown in this country. ICELAND and RUSSIA produce many-horned sheep, the number of the horns extending from four to eight: their fleece, in weight, about four pounds, dark brown in colour, long and hairy, covering an internal coat

of soft, short fur. RUSSIAN TARTARY produces large-polled, lop-eared, Roman-nosed sheep, resembling in countenance (as it appears to me by the portrait) our Wiltshires, and not altogether unlike those of the Dorsets, in form: their wool long and thick, in colour roan, or black and white; they are without a tail, instead of which, they have a large cushion of fat covering the rump, whence they were named by Pen-nant, *the fat-rumped* sheep; they are very prolific, usually bringing two or three at a time.

In Wallachia, Crete, and generally in the Islands of the Archipelago, they have sheep with curious spiral, vermicular horns, either standing perpendicular from the forehead, to a considerable height, or diverging a considerable space one from the other. They are good-sized, and not ill-shaped animals, and bear a long and shaggy, but not a rough fleece. I have seen some of these lately, and also at various periods individuals of many of those foreign species here described.

IN PERSIA, SYRIA, EGYPT, and BARBARY, are found the broad-tailed sheep, which tail, in some individuals, grows to the breadth of a foot, and to a length sufficient to bring them to the weight of twenty, and even fifty pounds, insomuch that the shepherds are obliged to support those enormous appendages on a carriage with small wheels, to prevent them from galling and exhausting the animals. These tails are esteemed a great delicacy, being a substance between fat and marrow. One of our late voyagers describes the Egyptian mutton as the best in the world. The mountain sheep of THIBET produce a wool of extraordinary length and fineness, of which is made the Indian shawl, of such high price in this country. The GUINEA sheep, a breed said to be common in the tropical climes, are described as large, strong,

and swift ; although domesticated, often found in a wild state ; having coarse, hairy fleeces, short horns, pendulous ears, and a kind of dewlap under the chin. Madagascar is said to produce sheep of good size and well covered with a close pile of smooth glossy hair.

BUCKHARIAN sheep also are hairy, kept in large flocks in Great Tartary. The island of Antigua, and probably other West India isles, have a breed of the same kind, which, it may be supposed, were originally carried thither by the Spaniards, who, we know, have been in the habit, from a very early period, of importing to their country, the hairy sheep of Africa. Sir Joseph Banks once imported thither, from Spain, three sheep with coats as sleek and smooth as those of a horse, and which never, at any season, shewed the least sign of wool or down.

In CHILI and PERU, but more particularly in the mountainous parts, on the lofty and rugged sides, and in the keen, pure, and rarified atmosphere of the Andes or Cordilleras, are found that peculiar variety of the sheep, or rather that gradation between the sheep and the camel, called the *huanacus* or guanaco, in their wild state ; and when domesticated, the *lama* : also a smaller variety of those, called the *vicunha* or *vegogne*, whilst in a state of nature ; its appellative, when tamed, being the *paco*. The lama is about four feet in height, or twelve hands ; and the length of its whole body, from head to tail, five or six feet ; its neck making three of them. Small, blood-like head, large eyes, rather long nose, thick lips, the upper cloven, the lower in a small degree pendulous ; the ears four inches long, moving with great quickness ; small deer-like tail, about half a foot long, and somewhat turned up at the end ; cloven-footed, but with a kind of spur, or natural calkin at heel, which,

penetrating the ground, assures the safety of the animal over precipices, or slippery ways; their backs are covered with a short wool, of the clothing kind, which yet grows very long on the belly and sides, and in colour, brown, but sometimes black or white.

The lama breeds in the third year, and is useful until the twelfth. They are of a meek and quiet disposition, but with an inherent obstinacy, in certain cases, similar to that of the dromedary; they are very easily subsisted, and drink little. The strongest of them will travel fifteen miles a day, for several days together, over the most rugged and mountainous ways, carrying a load of two hundred, to two hundred and half weight. They are chiefly employed in carrying the silver ore from the mines of Potosi, where above three hundred thousand of them have been actually employed at one time. Their flesh is esteemed excellent.

The *paco* resembles the lama in form, but is of inferior size, has shorter legs, and the muzzle thicker and closer. The flesh of this variety is inferior to that of the lama, but the wool superior, being fine, long, and equally valuable with silk. The natural colour of the *paco's* wool is that of a dried rose leaf, and so fixed, that it remains without alteration after manufacture. This wool is worked into gloves and stockings, and into quilts and carpets, bearing a higher price than those of the Levant. The *pacos* also produce the bezoar stone.

In this short general view of the various branches of the family of sheep, it is unnecessary to introduce the celebrated variety of Spain, of which hereafter it will be requisite to speak so much in detail; the same reason precludes any notice of the crossed and improved breeds in various countries on the continent. The present recapitulation is mere matter of curiosity, excepting that any foreign species could be pointed

out as worthy, on the principles of commercial utility, of the adoption of this country. Two foreign varieties only, of the sheep genus, impress me with that idea; which are the fine-woolled breed of Thibet, and the Chilian pacos. They are doubtless both valuable for their carcasses as human food, as well as for the precious fleece they bear. The introduction and growth of such wool might prove of vast importance to our manufactures, and at any rate forms a legitimate object of speculative curiosity; for powerful as is the ability of our agricultural and commercial bodies, and also of individuals, it is disgraceful to their industry and spirit of enterprize, to leave any means untried which bears even the semblance of a probable benefit to mankind and the country. The animals quoted are bred in lofty and cold situations, and the pacos in particular are said to subsist easily, and with health and safety, amidst ice and snow; but if otherwise, the experience of a century has taught us to naturalize to our soil, natives of climes the most opposite in temperature to our own; those of the burning deserts of Afric.

The larger wool bearing animals would not probably be worth the expense of naturalization in this country, from the inferiority of their flesh: the chief of these are the *Sarluc*, or grunting-ox of Tartary, the Louisanian *Bison*, and the *Musk-ox* of Hudson's Bay.

Of the USES to which every part of the body of the sheep is applied, and nothing of it is wasted, it were needless to speak. The CHARACTER of the sheep is universally and strongly imbued with timidity and heedless giddiness, whence a necessity of the most gentle and patient treatment, and a constant superintendence. Chacing sheep with dogs ought to be entirely banished from the practice of every enlightened shepherd, since we find, that flocks kindly treated, are perfectly docile and under command.

The **BODILY CONSTITUTION** of the sheep, as of the goat, the deer, the camel, the hare and rabbit, is usually called hot and dry; we however know, from unquestionable experience, that dry soils, a dry air, dry provender, and green food, which does not abound in cold and watery juices, are most appropriate and salutary to them. Indeed the contraries are replete with danger to the sheep, most particularly, which is naturally and constitutionally subject to serous effusion, producing a dropsy of a peculiar kind, either universal or circumscribed, but more usually the latter, extending indifferently to all parts of the body. This efflux of water, or rather watery tendency, in all the fluids of the body, gradually produces in the solids disorganization, mortification, or **ROT**. Catarrhal affections are the most usual primary causes of rot. These ideas very plainly indicate the proper situations, food, and treatment of sheep.

Sheep have been often described as of ‘a weakly constitution, liable to be exhausted by fatigue, and ill able to bear the extremes of heat and cold; subject to many diseases, most of which are contagious.’ Such notions are to be received with much allowance, for in truth, this useful race seems enabled by nature to accommodate itself to all the vicissitudes of climate, and to nearly the extremes of heat and cold, of which the husbandry, ancient and modern, of both northern and southern countries, forms the best proof. We see them accustomed to brave the most rigorous of these extremes, unhurt; liable, as may be expected from the nature of the case, to casualty and loss, which timely shelter might prevent. The sheep well fed, from its fleecy covering and gregarious habits, whence results an atmosphere of considerable warmth, remains very little affected by intense cold, if unaccompanied by moisture; he is perhaps more unfavourably affect-

ed by great heat, but continues safe under either extreme with the advantage of sufficient shelter, obviously one of the most important points in the sheep husbandry. The various diseases incident to sheep have their origin almost exclusively in neglect, improper situations and treatment, or errors in feeding. Reverse these, and diseases among sheep would be as few and rare, as they are now numerous and rife, throughout our sheep districts; another grand point in their husbandry.

The ancients were in the habit of affording SHELTER from the inclemency of the elements to their domesticated flocks, and most particularly to their ewes at the time of bringing forth. We have ample accounts of their sheep-houses and their vigilant attendance. These have been copied and recommended as absolutely necessary, by our early writers, but apparently with very little effect, for with the exception of *cotting* in Herefordshire, and perhaps in one or two more limited spots, the exposure of sheep, in all seasons, and suffering them to bring forth abroad, has been, and still is, the invariable practice of the British Isles. Upon the continent, where the winters are more severe than with us, the mild and provident practice of the ancients has been generally adhered to, amongst the most enlightened proprietors, with considerable improvements of late years; and we find, on comparative experience, that the extraordinary labour and expense has been most amply repaid, in the prevention of diseases, and mortality, and in the superior quantity and quality of the wool.

On the subject of wool, it is necessary that I call in professional assistance, which I find very opportunely at hand, in the papers of those real patriots, the Bath Society. The importance of wool has been much enhanced to the farmer of late years, and it be

hoves him to make himself more minutely acquainted with its properties, than has hitherto been generally the case, in order that he may avail himself of the knowledge of every step which leads to profit and improvement.

It will be sufficient in this place to adduce the two common DIVISIONS of wool; namely, the long and combing, and the short, or carding species; the former used in the manufacture of coarse, the latter in that of fine goods, chiefly for the purpose of broad cloth. Our British clothing wools not being of themselves sufficiently fine for the best broad cloths, it has hitherto been the custom, it is said, to intermix them with a much larger portion of imported Spanish wool.

In the first place, one of the two species of sheep, the long and the short woolled, having been chosen, as most appropriate to the situation, and wool being made an object, it is most advantageous to select such flocks as are as pure as possible of the species to which they belong, and not a mixture of the long and short woolled breeds, which must generally produce an inferior fleece, disadvantageous to the manufacturer. Length of staple in the long, and fineness, elasticity and closeness in the short-woolled fleece, will be the best guides in this case.

Whether the wool be long or short, the carcass of the animal ought to be amply and regularly covered; it is a great defect when the belly is bare, and a still greater, when the wool is thin and open along the ridge of the back, admitting rain and moisture to a most susceptible part, indeed to descend upon all parts of the body.

It is a piece of good old advice to buy your RAMS a little before shearing time, if possible; and a very necessary modern addition, to take the opportunity of purchasing at the farmer's house, whilst you can see

the animal in *puris naturalibus*, and before he has been decked out and trimmed for show, by the sheep-barber. A thick fleece, covering all parts with as much equality as possible, containing plenty of *yolk*, or retained and inspissated perspiration, is the object. If ewes, equally well-bred, can be procured, the shepherd anticipates and reaps an immediate benefit; if not, he must patiently await improvement of his wool, through the medium of the superior blood of his rams.

At SHEARING TIME, examine the bottom of the fleece, or the lower extremity of the filaments of wool; if it be *stitchy-haired*, of mixed quality, or if the sheep have a coarse breech, or be not well covered, it must be rejected, as improper for a breeding stock, where it would perpetuate its defects. The quantity of yolk or grease is a good proof of the thickness of the fleece, since by the closeness and thickness of the wool, the grease or perspirable matter of the animal is retained; hence fine, closed, curled wool has ever the greatest quantity of yolk. As it has always appeared to me, there needed not any question or dispute on this point: the use of this unctuous matter to the wool may be, to strengthen the filament, by its rendering it, in a certain degree, supple, and by preventing too great rigidity and brittleness.

BLACK WOOL is said to be much more liable to the inroads of the moths, than white, and even when made into cloth, but if the wool be dyed the objection ceases. FLEECE is the term for the wool shorn from one sheep, and wound together by a band twisted out of some parts of itself: Top, at Hereford, and in some other parts, has the same signification. A PACK of wool in the country is 244 lbs., in London 242 lbs: the standard tod 28 lbs. which varies in different districts. The stone at Hereford $12\frac{1}{2}$ lb. STAPLE is a word of such various application in the commercial

vocabulary, that it is difficult to assign to it a precise definition. Mr. Collins (Bath Papers) defines it to be a lock of wool: it is, however, an abstract term, to which relative qualities are conveniently ascribed, as *long, short, thick, thin, hovery or frothy, yolky, hard, harsh, soft, smooth, clear, strong, rotten, weak, cotted, felted, matted, hitched in the middle, or in the ground, in proof or out of proof*. If combing wool be matted in the middle of the staple, it will not open in the suds, and in combing will run almost to pinnels; if at the ground, it will open, and is but of little harm.

WOOL-BEARING being the natural, characteristic property of a genus of animals, is in course dependant on genus solely and absolutely, and unchangeable in essentials by soil, food, or climate; quality of wool, a characteristic of species, is dependant also on species solely. We know by experience, that all the various climates produce wool-bearing animals, and indifferently, all their different species, in respect to quality of wool. Yet, that wool may be, and indubitably is, affected, within certain degrees, although not radically, by the accidents above mentioned, is allowed; indeed it is obvious, that one certain invariable standard of quality cannot, in the nature of things, be preserved even under the most favourable circumstances of congenial soil and climate.

Persons versant in the subject, will perceive the meditated use and application of the above theory, when we come to treat of improvement. With respect to those superficial changes operated on wool by adventitious circumstances, they seem to be according to our experience, as follows: excess of heat or cold may reduce both its fineness and its weight; high and luxurious keep of the animals may increase the length of the staple, and the weight of the fleece, sometimes reducing in long wool the fineness of the filament; in

short, its elasticity only. Such effects have been asserted, and may probably have ensued; but it is at least equally certain, that the most forcing keep has been given in numberless instances, unattended with the smallest change in the quality or price of the wool. It is a far more certain maxim, because founded on invariable experience, both in this country, and upon the whole range of the continent, that insufficient keep and the exposure of sheep to the extreme rigour of the seasons, in our vulgar tongue “keeping them hard,” will decrease the quantity of wool, of either species, render it coarse and shaggy, and insufficient as a covering in various parts of the carcass. They will yet be wool-bearing animals; they will yet, under the operation of any, or all these causes of superficial change, still retain their specific distinction of long or short wool, granting no mixture by alien intercopulation, which is the only means of radical or specific change, and which may be extended to infinite variety.

On these principles it was, that Dr. Anderson, whom I have elsewhere took occasion to quote, as a sound theorist in the science, repelled the groundless notion of sheep losing their wool, and becoming hairy, after remaining a few seasons in the climate of Jamaica; an effect doubtless caused by intercopulation with an hairy breed; upon a similar principle the said hairy breed introduced into this country, for mere use, not experimental curiosity; and, in course, suffered to intermix with our woolly breed, would lose its characteristic hair, which would become amalgamated in the large and generally woolly mass; probably, however, leaving some lasting adulteration in the wool of the flock, with which they had been blended. That sheep of any species, if strictly preserved from foreign intercopulation, would retain their natural characteristic wool for ever, upon the island of Jamaica, I

should conceive there is not the slightest reason to doubt, since such phenomenon accords with the constant tenor of our experience. The residence of a long-haired European colony, through thousands of ages, in the heart of Afric, no intergeneration with the natives taking place, would not deprive the former of the original external European character stamped upon them by nature; would not be able to transform them into woolly-headed *shangalla*.

The deceptions on this subject which have so long prevailed, and which, in fact, are still in full force amongst us, are very easily explained. Some occult power of assimilation is supposed to reside in the soil, the product, the air, the water, or perhaps the name of a county or district. It seems you may introduce live stock of a different variety from another district, but you will ever find, in course of years, that you have "got your own again;" that is to say, that you have worked no perceptible change in the established breed of the county, and that you have lost all traces of the aliens introduced. But did you keep these aliens rigidly separate, and suffer them to breed only among themselves? Had you so done, they would have retained their original character, in despite of the supposed influence of soil, and you would not "have got your own again." On the contrary, had your introductions of the new variety been sufficiently numerous and constant, you would, in the course of time, have totally lost "your own," as it has actually happened in so many instances.

The product of the soil is supposed capable of effecting radical, instead of merely superficial and temporary changes in the body of the animal feeding upon it. Thus, a man seeing small short-woolled sheep, the fleece of a coarse, indifferent quality, immediately determines and very probably publishes his

opinion, that such pastures produce small, short-woolled sheep: but farther reflection might induce him rather to conclude, that small stock being best adapted to such short keep, were for that good reason originally introduced upon it. An improver, I apprehend, would fail in the attempt to render Lincoln and Teeswater sheep specifically small and short-woolled, by keeping a breeding flock of them, upon Bagshot Heath; the event might be, according to my guess, that the survivors would acquire a long, and shaggy fleece, leaving the back and belly nearly bare, an additional length of leg, and a gaunt, boney carcass, which would not make fat in haste; but that no length of time would serve to metamorphose them into a breed of small, and short-woolled stock.

From the former mode of reasoning it is decided, that large and long-woolled sheep are the natural growth of rich pastures, where, by an analogy apparently rational, but which may be powerfully controverted, the opinion has originated, that on the improvement of a soil, sheep of an increased size are most profitable.

In consequence of this theory in the sheep husbandry, under such circumstances, rams of a larger variety, and of the long-woolled species, have been sometimes introduced among short woolled stock. This practice takes place gradually, yet to such an extent, that in process of time, the whole breed of a district becomes thoroughly changed from short to long woolled sheep: the country entirely 'loses its own.' Thus it happened in the Cotswold hills, Gloucestershire. Now the circumstance of an alien cross is often overlooked by our speculators on the subject, and the change of size and wool attributed to gross keep solely. At this instant, we often hear complaints of the Ryeland and South Down fleeces having de-

generated in fineness from marsh, clover, or oil-cake feeding, whilst the real cause of the change, the late prevalent introduction of new Leicester tups amongst those breeds, more particularly the former, seems to be totally forgotten, or esteemed of no consequence in the question. It is already a difficult matter to procure any considerable number of genuine fine woolled sheep, or Ryelands, in Herefordshire; the common rage for increasing size in sheep has prevailed, for some years, amongst many of the South Down breeders; the Leicester cross is coming into use, in order to accelerate the growth of lambs for the butcher, from Down ewes, and if this old system be still pursued, we may live to see the extinction of the South Down breed, justly celebrated as it is.

The AGE of the sheep might be prolonged beyond twenty years; and I recollect to have heard of a bell-wether in Kent, which lived to full twenty-four years, his wool decreasing in quantity and quality with the increase of his years, until his body became bare in patches. In general, the incipient decay of the teeth, or the broken mouth, in sheep, is an infallible indication that their utility is on the wane, and that their keeper's, and the public profit require they should be forthwith replaced by younger stock. Nevertheless old ewes will breed good stock, and may be kept to eight or ten years of age, should any particular purpose render such a measure desirable; but old rams are not to be depended on.

DENTITION commences and is completed early with the lamb, and I have within these few hours examined the mouth of one three months old, which has its complement, eight small or lamb's teeth. Two of these, in front, fall and are replaced by two broad or sheeps' teeth, at some period previous to the sixteenth month, sometimes, although rarely, within the first

year. A similar renewal of two teeth takes place every succeeding year, until towards the end of the third, sometime during the fourth, or in the commencement of the fifth year, when the sheep is full mouthed or aged, having acquired his eight broad teeth. Mr. Culley observes, that in the opinion of some shepherds, sheep renew only six of their teeth, but if it sometimes so happens, I apprehend it to be only an exception to the general rule.

The APPELLATIVES, ancient, but still in use, are as follow.—A ram or wether lamb, after being weaned, is called a HOG, or HOGGITT, TAG or PUG, throughout the first year, or until he renew two teeth; the ewe, an EWE-LAMB, EWE-TEG or PUG. In the SECOND year the wether takes the name of SHEAR-HOG, and has his first two renewed or broad teeth, or he is called a TWO-TOOTHED TAG or PUG; the ewe is called a THAIVE, or two-toothed ewe tag or pug. In the THIRD year a SHEAR-HOG or FOUR-TOOTHED WETHER; a FOUR-TOOTHED EWE or THAIVE. The FOURTH year a SIX-TOOTHED WETHER or EWE. The FIFTH year having EIGHT BROAD TEETH, they are said to be FULL-MOUTHED SHEEP. Their age also, particularly of the rams, is reckoned by the number of times they have been shorn, the first shearing taking place in the second year; a SHEARLING or ONE-SHEAR, TWO SHEAR, &c. The term *pug* is, I believe, nearly become obsolete. In the West of England ram lambs are called *pur-lambs*.

I am obliged to the Rev. Mr. Findlater's Survey for the northern APPELLATIVES of sheep: they are designated as follows—MALES, from lambing time until Martinmas, when they are salved, are called TUP-LAMBS: from that time to the following July, when they are shorn, TUP-HOGS: ever after, TUPS. FEMALES, in the same order, EWE-LAMBS—EWE HOGS—GIMMERS—YOUNG

EWES—OLD EWES.—CASTRATED WEDDER-LAMBS—
WEDDER-HOGS—DUMMONDS—WEDDERS.

The ancient term *tup*, for a ram, is in full use. CRONE still signifies an old ewe. Of *crock*, I know nothing of the etymology, and little more of the signification, only that the London butchers of the old school, and some few of the present, call Wiltshire sheep horned *crocks*. I believe *crock mutton* is a term of inferiority.

These rules respecting the age of the sheep, although sufficiently accurate for general utility, cannot be precisely so, since the lambing time is not always at a regular period, and since dentition may be retarded or accelerated by insufficient or plentiful keep. There have been many instances in high fed tups, of the two first sheep's teeth pushing up within the year. The teeth of sheep and lambs are often also prematurely broken by hard articles of food, such as certain kinds of turnips, hard beans, and harsh straw, a considerable detriment to them in feeding, and impediment to their proof.

The ewe is capable of PROCREATION as soon as she produces sheeps' or broad teeth, but if she bring stock towards the close of the second year, it may be sufficiently early. The period of GESTATION with the ewe is from twenty weeks, to one hundred and fifty days, and she will breed twice and even thrice a year, if it be made a point to produce such an effect by attention and high keep, since she will receive the male indifferently at any season, and like the rabbit, very soon after bringing forth.

Lisle gives an instance of three of his ewes, well kept, lambing at Christmas, fattening off their lambs at Lady Day, and producing lambs again, the first week in June. It seems they stole the ram immediately after lambing, but brought the second time only single

lambs, although of a breed that generally produces twins. I think there is no doubt but the sheep would produce young thrice a year, were the bad practice resorted to, which has been so currently recommended with the rabbit, of allowing the male immediately after parturition; the ready way to render both the female and her progeny worthless. Could the lambs be advantageously weaned at two months, sufficient time would remain for the ewe to bring forth twice within the year; for example, suppose the young ewe tupped in August, the lamb would be dropped in the middle of January, and might be weaned in mid March, the ewe again receiving the ram on the turn of the milk, like the sow, perhaps in or before April, she would then bring forth within the twelve months or in August. This plan would at least injure the dam infinitely less than suckling during gestation.

The ewe brings most commonly one, next in degree of frequency, two, rarely from three to five lambs at a birth. This property of double birth is in some instances specific; the Dorset sheep usually yeanning twins, and the large polled Belgic sheep, with their descendants, our Teeswater, doing the same, and producing occasionally more at a birth. Other breeds bring twins, in the proportion of one third of the flock, which is supposed to depend considerably on good keep. A certain number of ewes per centum prove barren annually; the cause, very rarely, natural defect; sometimes over fatness, a morbid state of body from poverty or neglect of the ram, in other words, want of system in the shepherd.

Barnaby Goge (p. 139) says, "Ewes for the most part bring but one lamb apiece, yet oftentimes two, and if they be well fed, five at a time. It hath been seen in Guelderland, that five ewes have had in one year, five and twenty lambs; it may seem peradventure

to many incredible, and yet no great marvel, since they have *twice a year*, most times two, and sometimes five at a time."

Mr. Culley gives the following uncommon instance of fecundity in a Teeswater ewe. "When two years old in 1772, she brought four lambs: In 1773 five: In 1774 two: In 1775 five: In 1776 two: In 1777 two." The first nine lambs were lambled in eleven months.

This large species of sheep Mr. Culley justly observes are not adapted to numerous flocks or poor ground, and require the best winter keep. On the fruitful banks of their native Tees, they are kept in small well-sheltered inclosures, enjoying the privilege of the haystack during winter, the ewes receiving the benefit of corn some time previous and subsequent to parturition.

The reader will bear in mind those general rules on the subject of FORM in animals, which I tendered to his consideration and correction in a former work, and transcribed in p. 21 of the present. Hereafter follow other opinions ancient and modern, on the subject.

COLUMELLA recommends the RAM which is tall, with a pendent and woolly belly, an exceedingly long tail and thick fleece, a broad forehead, twisted horns and large testicles, preferring however the hornless breed. The ram not to be used in the flock until three, nor after eight years of age. The EWE to come into breeding use at two years; to have "a huge body, a long neck, a large belly, well covered; long wool, but not harsh or coarse." He counsels very wisely and practically, to avoid the ewe "with a peeled, bare, and small belly."

MARKHAM advises "to choose your sheep the *biggest boned*, with the best wool, the staple being soft,

greasy, and well curled, and close together, so that a man shall have much ado to part it with his fingers. These sheep, beside bearing the best burden, *are always the best butcher's ware, and go soonest away in the market.* The RAM large of body, in every general part, with a long body and a large belly, his forehead broad, round and well rising, a cheerful large eye, straight short nostrils, and a very small muzzle, by no means any horns, for the dodder [hornless] sheep is the best breeder, and his issue never dangereth the dam in yeaning as the horned sheep do. A large upright neck, somewhat bending like the neck of a horse, a very broad back, round buttocks, a thick tail, and short jointed legs, *small, clean, and nimble,* his wool should be thick and deep, covering his belly all over; also his face and even to his nostrils, and so downwards to his very knees and thighs." The reader has doubtless remarked in the first part of this quotation, the advice to choose the *biggest boned sheep*, in the latter, a recommendation of *small, clean legs*, a trifling inaccuracy that, in the collections of old Gervase. The general description of the sheep however, does no dishonour to the discernment of the breeders in the reign of our virgin Queen.

Culley's description of the RAM. "His head should be fine and small, his nostrils wide and expanded, his eyes prominent and rather bold or daring, 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, being perfectly free from any coarse leather hanging down; the shoulders broad and full, which must at the same time join so easy to the collar forward, and chine backward, as to leave not the least hollow in either place; the mutton upon his arm or fore thigh must come quite to the knee; his legs upright, with a clean

fine bone, being equally clear from superfluous skin and coarse hairy wool, from the knee and hough downwards; the breast broad and well forward, which will keep his fore legs at a proper wideness; his girth or chest full and deep, and instead of a hollow behind the shoulders, that part by some called the fore flank should be quite full; the back and loins broad, flat, and straight, from which the ribs must rise with a fine, circular arch; his belly straight, the quarters long and full, with the mutton quite down to the hough, which should neither stand in nor out; his twist [the junction of the inside of the thighs] deep, wide, and full, which, with the broad breast, will keep his four legs open and upright; the whole body covered with a thin pelt, and that with fine, bright, soft wool." Mr. Culley's present breed from new Leicester tups, comes nearer perhaps to the above description than any other breed in Britain, and I am assured by one of our best judges of sheep, who has lately viewed many flocks of them in the North, that they are our best variety of new Leicesters, and even superior to their originals: I should be glad to see some of these tups made use of in the South.

The NUMBER of sheep in the kingdom were a few years since calculated at twenty-six millions; and of lambs ten millions: which by this time, with our increasing population, we may justly conclude much augmented. The old author I before alluded to, p. 241, has also given a table of the increase of sheep, according to which, a person beginning with a stock of ten ewes, will find in the twelfth year [casualties excepted] his increase to be 879 ewes, 439 ewe lambs, and 440 wethers; the total number of the living stock being 2852. I have several times noticed with pleasure the flock of a poor labourer raised from the smallest beginning; in particular, the flock of a poor lad,

from a single ewe lamb won by him at a raffle; and another of a poor young man and his wife, who were yet turned out of their comfortable home by the act of settlement. An extensive and judicious scheme of sheep-breeding, which supposes improved stock, the best management, and ample scope in a fit country, cannot fail, in the course of years, to create a considerable fortune.

FOLDING sheep, I have observed, in the *New Farmer's Calendar*, is not generally deemed a part of improved husbandry, yet there are perhaps, circumstances which may render it eligible, or at least incline the farmer to the practice. It is moreover almost universally practised upon light soils, but seldom on those deep and rich lands, where heavy long woolled sheep are fed, or where grazing, rather than breeding is the object.

It does not appear clearly, from any of the ancient writers, whether the moveable fold, for the purpose of dressing the land, was in use in their time, nor is it easy to trace the commencement of the practice in this country, or in Spain, where also, it has prevailed, and whence probably we derived the knowledge of it. I do not observe it mentioned in Barnaby Goge, who, however, was rather a learned compiler, than an original or practical writer on rural affairs. Mascal and Markham speak little, but rationally, on the subject, giving proper cautions on the danger of folding, to the health of the sheep. Mortimer, a truly original writer, *de re rustica*, speaks in the same tone. From these sources of information, it does not appear, that the practice in question was so general, or so highly in repute in their time, as it has since been; and it seems to have gained ground during the last century, and with it a much more free exposure of sheep to the rigours of the seasons, than had the sanction of ancient

usage. This improvement, or rather change, is perhaps destined to be moderated by the increased light and matured experience of the present period.

The opinion of Mr. BAKEWELL (if the vulgar accompaniment of *Mister* ought to be tacked to the name of the eminent defunct) on the merits of folding was as follows: "The advantages supposed to be derived from it are visionary; being in fact no more than robbing a large part of a farm to enrich a small one. Large flocks, even any number kept together above one hundred, is a barbarous practice: for in such flocks the strongest will beat the rest from their food; instead of which, the weakest sheep should have the best food; and if folding is necessary on farms that have no commons annexed to them, why not have different small folds on different parts of the farm, and for those of different kinds, or ages and strength, and thereby save the trouble of driving from one part of the farm to another? for had not the animal, after it has filled its belly, better lie down to sleep, than travel to create an appetite? From his general observation in various parts of the kingdom where folding is, and is not practised, his opinion was confirmed; nor would he allow any utility to the fold, excepting perhaps in the case of *a flock feeding on large open commons by day, and considered in the light of mere dung carriers to the arable land.*"

In the last case, of sheep being mere dung carriers, I am convinced it would be infinitely to the advantage both of the flock and the arable land, for the sheep to be driven to a good home fold by night, and well fed, instead of being travelled, perhaps from starving or short commons, to lie all night with empty bellies on the bare earth. In the former method, the sheep would be thriving, at the same time making double the quantity of manure, and of far better quality,

than that which they possibly could in the latter, by which also their improvement is out of question. I do not altogether coincide with the above great authority, in one point, which has been generally adopted by all who write or speak against folding: it does not appear clear or accurate to me, that the practice "robs a large part of the farm to enrich a small one." I am inclined to see the matter in an opposite light. Perhaps if the farmer will not go the length of a home or standing fold, his store sheep, granting them well fed, and in good heart, may, with advantage, assist the arable land, by folding it; more especially, if other resources are few, and the land, from distance or various causes, inconvenient for the dung cart. As to folding starved sheep, or as it is called, working them hard, that is to say, travelling and harassing them about long distances in the worst weather, and in all seasons, heavy ewes or couples, or whatever the stock may consist of, it is one of those numerous follies, which men are accustomed to learn by rote, and as they can assign no reason for their opinions or practice, so they will hear none. Mortality, the hunger rot, pelt rot, scab, foot rot, loss in quantity and quality of wool, appear, now and then, in shape of powerful arguments, but perhaps generally, the natural hardiness of the stock rising superior to all disadvantages, it is not perceived or calculated, how much greater profit the stock would pay for better treatment, and that the gain by *keeping them hard*, Irish as the phrase may seem, is really a heavy loss. The separation of flocks, and their division into numbers as fifty or under, assorted according to strength or age, would be attended with numerous and great advantages, with which the expence of extra assistance of shepherd lads, forming too a good school for that class of servants, would hold no competition;

and indeed the success of the plan has long been fully established by the experiments of various intelligent sheep masters. It is certainly a strong argument against folding, that so eminent and experienced a cultivator as T. W. Coke, Esq. of Holkham, in the folding county of Norfolk, has quitted the practice; and that Mr. Arthur Young, who remarked on Bakewell's opinion, "his own ideas were as far as the poles asunder," has entirely changed his sentiments, and is no longer an advocate for the fold.

But as the practice of folding is at present in extensive use, and may long continue, at least partially, it is necessary to speak of the former and present modes, and the degrees of benefit at which they are rated. Mascal, in whose book, as has been before observed, we sometimes find practical and useful ideas, directs to DRAW AND DIVIDE sheep, immediately after shearing, into small parties, the most proper to feed together; for example, ewes, lambs, shear hogs, wethers, and rams, each flock by itself, that the large may not beat the small, nor the strong drive the weak. He commends frequent changes of pasture for the speedy fattening of all cattle, and particularly recommends it for such as are weak, and of which it is desirable to make a speedy end.

Some, he observes, are accustomed to set their fold with divers partitions for the ewes, lambs, and wethers, tying dogs, as a guard, at the four corners. In some places, the shepherd hath his CABIN going upon wheels, to move with the fold, an old custom, which surely might be revived, with advantage, in many of our wild and exposed sheep districts, where the poor shepherds suffer so severely from the severity of the weather, and where even many have perished. Shepherds, he observes, need not care greatly for folding but once in a year, which is from July until after

August, except in dry countries; and that they never usually fold in autumn or winter, or in wet weather, which they hold not beneficial, but stick poles in the land, by which the sheep will lie down.

PENS are also made near the fields, or pastures side, in some dry ground, with partitions to receive troops of forty or more, that they may be at any time under command, for examination and selection.

Mortimer says, some farmers made great improvement of their land by folding, confining themselves, however, to the summer season and dry weather, because the practice of folding is supposed apt to produce the rot: many reckoned all folding of sheep to be very bad for them, and therefore contented themselves with sticking up stakes, sloping in the ground, to which the sheep would come and rub themselves, leaving there their dung and urine.

At present, sheep are folded throughout the year, in various parts of England, but more generally in the south and west. Ewes or couples will make more manure than wethers, and eight hundred of the former, that is, ewes and their lambs, if well fed, or from sixteen hundred to two thousand of the latter, will amply manure an acre in a single night, a dressing probably worth a guinea or upwards. It ought, however, to be recollected, that good fold manure lasts but two years, and that the inferior is of a cold and unsubstantial nature, its effect being visible only in a single crop. In hard winters, it has been observed, that wheat upon folded land has perished, when that upon land which had received a good manuring from the dung cart, resisted the rigour of the season, and produced a full crop. The annual value of sheep for folding may be from three to seven shillings a head, dependant on their size and treatment. A sheep is allowed upwards of a yard square, in the fold, which

should be repeated, if the land be not well covered the first time.

Mr. Ellman, the well known Sussex improver, writes as follows (*An. Ag.*): “ Just 20 South Down sheep [if a larger sort, a less number will do] will fold one rod per night; 3200 will fold one English acre per night. We value the manure at from 35 to 50s. per acre, the goodness of which depends much on how the sheep are kept: if kept on artificial food, such as tares, rape, clover, turnips, &c. they will drop more soil than if fed on grass only. Suppose we estimate the folding at 40s. per acre, it will amount per year, to 4s. 6d $\frac{1}{4}$. per sheep; £22. 16s. 3d. per 100, or £223. 2s. 6d. per 1000, supposing the sheep folded throughout the year. If it be a breeding flock, it might be well to omit folding for five or six weeks immediately after lambing, as the young lambs might suffer from being trampled upon, and from driving to and from fold, would often lose their dams, and suffer in that way, more than if they remained quiet.” Mr. Ellman reasons respectably on folding, but does not go so far as to enquire whether the annual value of the fold might not be greatly enhanced by other methods.

The HURDLES, or fence gates, which are stuck into the earth, to confine the sheep in fold, are either open ledged, close rodded or wattled, closed up with a net work of small cord, or of reed and straw. I have been accustomed only to the rodded hurdles, and I think those, or any close ones, far preferable to the open, as in some degree sheltering the fold. From twenty-five to thirty-five hurdles will enclose a fold of one hundred sheep. In winter folding, and when the earth is damp and cold, our best sheep masters allow hay; racks, or cratches, being placed in the fold, afford shelter, as well as food, to the sheep, and some go so far as to litter the fold with stubble or waste

straw, by which the sheep have warm lodging, their wool is preserved from soil, and the quantity of manure increased.

The *STANDING FOLD* has been adopted by several improving farmers, in seasons when the land is too wet for the common practice. This fold is fixed upon a head-land, in a dry and sheltered situation, and well littered with straw daily, or as often as the stock of straw or stubble will admit, and the sheep are well fed, morning and evening, with turnips and some hay, or whatever may have been provided. They should be let out daily for exercise, and to pick about upon the land, four or five hours in the middle of the day, unless very bad weather forbid. One hundred and thirty-four sheep and thirty lambs, thus penned, six weeks, and littered with five loads and forty trusses of oat straw, forty pounds to the truss, made twenty-eight large loads of dung, and consumed two acres of turnips within the time. *An. Ag.*

But the late Mr. Macro, of Suffolk, a most respectable name in the annals of good husbandry, carried this system of the standing out-fold still nearer to perfection. In autumn, 1785, he inclosed a double fold with thirteen dozen of old hurdles, seven feet long each, made with wands, and raised a haulm fence around them, composed of upwards of sixty loads of wheat stubble, the area of the fold being littered with about thirty loads more: in this the flock were to be lodged when the field-fold was unsafe, or could not be removed from place to place, on account of frost, snow, or floods. He made, during the first winter season, 493 loads of manure, improving at the same time the condition of his flock. The land laid at too great a distance to be manured from the home stall.

Mr. Macro observes, that before he thought of this scheme, his sheep were always obliged to lie, in bad weather, upon a certain sheltered part of a heath, where the fold manure was not only lost to his farm, but the grass, on which the dung was heaped in such quantity, became so coarse and sour, that nothing would eat it: exclusive of this damage, he used to lose by mortality, in a wet or severe season, during yeaning time, a much greater number of both sheep and lambs, for want of the dry, warm lodging of a sheltered fold, the advantage of which he estimated at thirty or forty pounds per year, at least. He saved not less by his improved plan, than thirty lambs in a year, besides sheep, amounting to a greater number of lambs than he usually reared in one year, during that period of his farming business. The vast superiority here so clearly evinced over the common, moveable, and naked fold, renders all auxiliary arguments unnecessary, with men open to conviction; with others all reasoning is useless: it is yet curious to observe, that even the respectable inventor [such he probably was for himself] of this excellent plan, only made use of it in bad weather, and not constantly, notwithstanding its obvious superiority in all seasons and all weathers.

The COVERED FOLD and COTTING. Mordant, who wrote about half a century since, observes, that—“ In Essex it is common for the farmers to fold their sheep in covered folds, and mix their dung with ditch earth, mud, &c. which causes the dung to spread and go much farther. In Gloucestershire, &c. the farmers house their sheep at night, and litter them with straw, and when one quantity is converted into soil, they add fresh, so that a whole winter affords a great quantity of dung where there is a large flock kept, and it is found by long experience to answer the

trouble; so that by folding in summer, and housing in winter, all their dung and urine is preserved for the land in tillage. SHEEP PENS are to be made at some convenient corner of a pasture, or where several fields, commons, or pastures meet, so as to be common to them all. They should also be erected on a dry spot of ground, and stones laid at the bottom to keep the sheep dry and clean, whilst under examination. The pens to be divided into partitions to hold about forty sheep.

“The SHEEP HOUSES for warmth in the winter season are made low, and a third part longer than broad, and rather large, the sides lined with furze or boards, for warmth, the bottom laid with large stone slabs, and very level, that the urine run not away, but soak into the litter. It would be proper to have the sunny side set with lined, moveable hurdles, that when the sun shines it may be laid open to give the sheep a refreshment, by letting them into some close or croft, wherein the sheep-house stands: the house to be well covered.” I am not aware that the covered fold was ever so common in Essex, as the above writer supposed. COTTING or housing of sheep, I believe to be nearly disused in Gloucestershire, and to be much less in use than formerly, even in Herefordshire, a change, in my apprehension, without improvement.

From the preceding data the impartial reader may derive some assistance towards forming a decisive opinion on the important question of folding. I say the impartial reader, without great expectation of finding such amongst those who have imbibed an early prejudice in favour of a practice which is unquestionably attended with benefit, and appears at least calculated to save trouble. I might be tempted to give in to the practice occasionally, and under circumstances as I have stated, but that the common fold

can come into any degree of competition in the various points of profit with the home-fold, or the standing out-fold, I know from a great number of experiments, would be a preposterous supposition. Granting sheep to be hardy animals, they will yet well reward the shepherd who keeps them dry, allowing them, at the same time, plenty of air; and the northern gentleman who said the sheep never improved more, than when kept in the style of a *pet*, shewed himself thoroughly acquainted with their nature. Nor do I agree with the calculations of those, who, in the exposure of their sheep, ground so much in the saving of expense; nor join in the opinion of others, who attribute the fineness or weight of the fleece to a virtue derived from contact with the ploughed soil. The universal tenor of long-continued experiment teaches us other things. The comparison of the common practice with coting or home-folding, may be brought to a point, by stating, on opposite sides, Mr. Ellman's calculation of the value of dung made per annum by 100 sheep, viz. £22. 16. 3. and the result of a number of experiments, by which it appears, that a middling sized sheep will make full three quarters of a load of dung in the house, during the winter season, to which is to be added, the profit of the summer fold, in either method. I agree with Mr. Kent, that the large breeds of sheep may be folded, as has been often enough proved, with the old Lincolns and the Cotswolds, but it cannot be doubted, that short distances to the fold, and good keep, ought to be presupposed.

There is, I believe, a small TREE-FOLD upon Newmarket heath, of a circular form, for the protection of sheep from the rigour or extreme heat of the weather. The Annals of Agriculture also notice a plantation of trees for this important purpose, in the form

of windmill sails, the trees standing upon banks five feet high, in the centre of a heath in Suffolk. The flocks are thus sheltered, and the hay secured from blowing away, to whatever point the wind may blow. But it seems strange, that the great superiority, and no more than equal labour and expense of the surrounding form, did not occur to the contrivers of this plan; and still more strange, that any common in the British Isles should be without its appportionate number of such inestimable conveniences as plantation-folds.

The SHEPHERD, in our country, has been in all ages, too commonly, a knowing and wicked dog, that is to say, sharp sighted, subtle witted, conceited, ignorant, treacherous, and thievish. I speak of professors. On this head, hear old Leonard Mascall. "The shepherd ought to be of good-nature, wise, skilful, countable and right in all his doings, wherein few are to be found at this day, especially in villages and towns; for by their idleness and long rest, they grow now to wax stubborn, and are given for the most part, to frowardness and evil, more than good profit to their masters; and ill-mannered, whereof breeds many a thievish condition, being pickers, liars, and stealers, and runners about from place to place, with many other infinite evils."

On the continent, they have schools, wherein young shepherds are reared with the necessary knowledge of their business, being instructed in the anatomy and physiology of the sheep, and in their different species, the food and treatment proper for them, throughout the seasons, a skill in their diseases, and in the common operations, particularly in the manual assistance often required by the parturient ewe. Our shepherds are too often equally ignorant and conceited, indeed so bigotted to the ways in which they have been bred,

that it is a task too mighty for the generality of masters, to reform them. The cause of the mischief and its remedy lie both together upon the surface. The master is too indolent either to learn his own business, or to practise it, and so changes places with his servant; instead of which, a master thoroughly skilled, both theoretically and practically, in the sheep husbandry, is absolutely necessary to the formation of a good shepherd, who ought to be compelled to the most punctilious observance of orders, and ever discharged for the second wilful breach. A man with native good sense, receiving fair reward and encouragement for his labour, will submit to this discipline with pleasure, at least, I have generally found it so. The method of encouragement, adopted in some districts, of allowing the shepherd to possess a small flock, or as many ewes as his means will allow, is probably of the most powerful. It gives him the steadiness appertaining to property, and is an additional and strong incentive to the attainment of knowledge in his business. A shepherd should be naturally active, both in body and mind, clear-headed and clear-sighted; such an one, for instance, who can distinguish the individual countenances of a numerous flock, and running over them with his bodily and mental eye, instantly give the exact number and condition; or perceive, at a glance, a bird's nest in the thickest quickset. Fond of animals and attractive to them, (the latter quality is well known naturally to inhere in some persons) possessing a musical voice and shrill whistle; hardy, patient, watchful, satisfied with little sleep, and temperate in drink. He ought never to be suffered, if he profess, to practise physic, nor any but the most easy and common operations, a farce that too often ends in a tragedy; for if of two

evils we ought to choose the least, the office of medical practice had better devolve on the master.

The shepherd's hut, for his comfort in the severe weather, has been adverted to; in some situations, the moveable wooden house on wheels may be of use. He ought to be clad, during winter, with substantial woollen next his skin, from his feet upwards, as the best defence against those rheumatic ails to which he must be necessarily subject; and he should always go provided with the instruments proper to his profession, ready for immediate occasions; namely, scissars, knife, steel, fleams, salve-box, &c.

The necessity of a dog, as an assistant to the shepherd, has of late very rationally become a question among the most intelligent sheep-masters: it may probably be thus settled—there can be no occasion of any such aid, nor any necessity for incurring the danger of it, amidst convenient enclosures, or where quiet breeds of sheep are kept, and where it is made an object to render them tame and docile; and if upon extensive wastes and mountain districts, the service of dogs cannot well be dispensed with, it ought to be made a main point, that they be trained early to a kindness for the sheep, and to view them rather as their companions, than their prey; a thing which I know by experience to be most easy, and I also know that such dogs are infinitely of the greater use, as the sheep, far from dreading or shunning, will run to them, in case of need, for protection; and I have often witnessed the caresses and gambols of these and the lambs, with a delight which I never experience in the combats of animals. The present method of training shepherds' dogs, in too many parts, is as if they were intended to hunt the sheep as a prey, and the fellows take as much delight in pursuits of this

kind, as the rascally and insensible blackguards of Smithfield market; hence infinite mischief is done annually, to ewes in lamb, and to weak diseased sheep; the real cause perhaps not even suspected by the master. I have heard of a whole lot of ewes made to cast their lambs, from being chased by the dog, for the pleasure of a young shepherd, who no doubt had been taught to delight in the rational amusement of hunting. In conclusion, a dog properly trained and beloved by the sheep, can do no mischief in any situation, provided the shepherd be equally well educated, and possess as much feeling and common sense as his dog.

The various PLANS of sheep-farming in this country are at once designated under the following heads—A BREEDING FLOCK, the lambs being sold to go to keep, or fattened for grass lamb, or suckled for house lamb, or kept on, to be grazed and sold, either as store or fat wethers; the ewes as they are culled, being sold lean, or fattened, as profit or convenience may indicate. Thus the farmer will determine according to his situation and capital. He may breed and fatten all off, lambs, wethers, and ewes, if his purse will reach such a comprehensive system, and if markets for the disposal of fat stock are within his reach, and this ought to be, and probably, on an average of years, is the most advantageous scheme: or he may do this in part, judiciously turning his plan and his money with the vicissitudes of the times: as for example, it sometimes happens that store stock shall be above all reasonable price, when it is generally good policy to sell. The least risk and the least trouble attends the purchase and keeping of a store flock, which may be lambs, wethers, or crones (old ewes), some of which last may prove in lamb, and which may be fattened off with their lambs. Ewes also are

currently sold in lamb, or in couples, that is, having lambs by their side; some purchase these annually, in order to dispose of both fat, within the year. There has been immemorially a miserable practice in waste land districts, to keep a breeding flock of the scum of all creatures in the form of sheep, merely for the sake of skin and wool.

We breed on poor land, not because we cannot breed upon that which is rich, but because we cannot fatten on that which is poor: and as rich land is best adapted to fattening, we make the most of its prominent quality, by adhering to that system, and the quickest return of good fat wethers is the most profitable application of deep and grassy soils: this is said without any view of deciding the question of superiority as to profit, between grazing oxen or sheep, which must probably follow the question of size.

It has been said, wool is a secondary consideration: but that position has lost much of its force from the improvement which has already happily taken place; and I believe our best woolled sheep of either kind, will also produce the greatest quantity of mutton. If in remote, poor-land districts, they content themselves with a coarse-woolled, hairy species of sheep, it is no longer from necessity, but the indolence induced by inveterate habit. It has now become the bounden duty of our great landed proprietors, to themselves, to their tenantry, and the country, to set the example, by introducing upon such sheep-pastures, flocks of a species which will produce both a good carcass and a good fleece; preparatory to which, measures must be taken to secure winter provision and shelter, a thing unquestionably practicable, upon the least favoured spots in Britain, as is proved to our conviction, by the example of rational sheep-masters,

in climates far more rigorous and difficult than our own; and this reform, in which the public interest is so deeply concerned, ought not to be deferred an instant, since the prejudices and indolence of remote and recluse people are ordinarily so great a length of time in giving ground.

Experiments upon a small scale, commenced with practical judgment, and continued with perseverance, will prove decisive, at a risk and expense so trifling, that they merit no notice: and even their ill success will leave to the experimenter a useful addition to his stock of knowledge, and the not inconsiderable desert of having made an attempt to accelerate the necessary progress of improvement.

Complaints have been made, in various parts, that it has been useless to improve the quality of wool, since the improvers had it not in their power to reimburse themselves by raising their price in consequence. This might depend perhaps on local situation, or probably more on the narrow limits of the improvement; but, doubtless, could the whole, or a very considerable portion of the wool of a district be amended in quality, an enhancement of price would follow as a necessary consequence. Such result we have lately witnessed, in regard to the wools improved by the Spanish cross, which, at first, produced no higher price than the current one of our home wools, but which now, having become an established article, are readily saleable at an advance apportioned to their improvement, and which will doubtless rise in price, as from a repetition of the cross, they advance in quality. But in case of difficulty or obstruction from local situation, facilities for the disposal of improved wool, should be afforded to the tenantry by an association of the great proprietors for the establishment of fairs, depots of wool, or of any measures

of similar tendency, which may appear eligible and effective. After these preparatory reflections, we proceed with the practical branches of our subject.

Reasons have been already assigned, why there can be little use or dependance on calculations of profit, or of the number of sheep to be kept per acre, or upon a farm; those must depend entirely on local circumstances: let the young farmer, at first, look over his neighbour's hedge and follow the established custom, which he may afterwards regulate by the standard of his own reason and experience.

The PURCHASE of sheep may be made at distant fairs with greater convenience than of any other animals, on account of the considerable number generally wanted, which reduces the expenses per head, and on account of the subsistence they find upon the commons in their journey; this consideration affords great encouragement to the view of procuring the best stock; nor is the question of the consequence of a single pin, whether this or that breed of sheep has, by custom, been kept upon the farm, or in the district, but whether the species be adapted to the soil and the keep. I advert to this, as a known source of vulgar error, and a common bar to improvement, although it be fostered by a number of grave advisers, both orally and in print. The farmer who goes with his shepherd to a distant county to purchase sheep, had need be *à l'fait* on every point of the profession, and if so, will find himself much assisted by a friendly resident in the vicinity, or even by a salesman in the market, to whom it may be well worth while to allow a commission for the benefit of his judgment; the latter is a measure to which I have frequently had recourse, with considerable advantage.

The SIGNS OF HEALTH in sheep are, first—a *skittish briskness, clear azure eye, florid, ruddy eye-strings and*

gums, teeth fast, sweet, wholesome breath, nose and eyes dry, respiration free and regular, feet cool, dung substantial, wool fast and unbroken, skin of a fine florid red, particularly on the brisket. Sheep are often seen in the market, with nose and eyes running, or as we should say of a horse, almost glandered. This happens from wet layers, during their travel, in cold, windy seasons; and a continuance of such weather, and perhaps after-neglects, lay the foundations of diseases of which afterwards the cause is not suspected. Great caution is necessary during *drift*, that the flock be not suffered to rest on wet and boggy layers, and that they are provided with dry lodging, and sufficient keep to support their strength; and if on their arrival at home, any sinister appearances should be visible, it will be a great saving to nurse and recruit the sheep a while, in a good dry sheltered yard.

The management of A BREEDING FLOCK must depend, to a certain degree, on governing, local circumstances: for example, the TUPPING SEASON, or that in which the ram is put to the ewes, must be regulated by the period desired for the fall of lambs, dependant on that, in which they can be best supported, earlier or later, according to the state of the country. A shearling tup will serve fifty or sixty ewes in the season; an aged one, from one to two hundred. Nothing can be more absurd than the old method of managing this business, which indeed prevails at present in too many parts. A number of rams are turned into a large flock, where, in their combats, they beat each other to pieces, neglect, or ineffectually serve the ewes, besides attending some, and rejecting others. A more proper method is to put each ram to his stated number of ewes, but it is still preferable, to confine the ram in a paddock, or other convenient place, giving him a few ewes, and replacing such as

have been served, with others; this is to reduce the matter to a certainty, and to make the most of the ram's powers. It would be superfluous to explain the utility of keeping the tup high at this time, in which view, barley and pease ground together, form an excellent diet. The reader will perceive I am not treating of the management of ordinary stock. Various methods have been recommended to stimulate those ewes which are backward to take the ram, and some of them extremely irrational; the most effectual of which I am apprized, is the allowance of nourishing food, with a moderate plenty of water; probably two baits per day, of a meal composed of buck-wheat and pease, would in a short time produce the desired effect. There are several causes of adventitious barrenness which elude observation in a flock, but which, in the present method, are easily detected. I have heard of ewes so closely enveloped behind, in their fleece, that the ram was absolutely incapable of performing his duty; and of others, which, from a natural want of capacity, could not admit the ram, until an operation had been performed. In extensive flocks, however, the most general cause of the barrenness of ewes, is, that the ram has never addressed them, nor are the marks of the ram's feet always a certain sign that the ewe has been effectually served. After the whole ewe flock shall have visited the ram, in parties, it is yet proper to leave a tup with each flock a few weeks.

The various species of both SUMMER and WINTER FOOD, together with hints on the storing and management of the latter, have been already described in treating of the larger horned cattle, between which and sheep, the article of diet is in common. There is no doubt but the fine down grasses are the most natural and best food for sheep, and make the finest

mutton, but where such immense flocks are kept, as in this country, and where land is wanted for other purposes, various substitutes for grass must be resorted to. Upon good land, these are indeed so various and easily attainable, that the man, who, in such a situation, should be defective for the support of his flock, even in March and April, the most trying season of the year, would commit high treason against œconomy, and even against common sense. In poor countries, the case is somewhat different, although by no means a hopeless one, for where sheep may be kept at all, they may be kept in a healthy and improving state, and the opinion does credit to the pages of Columella, *that it is far more profitable to keep a small number of sheep in good condition, than a large number in poverty.*

All the ROOT and GREEN crops, with fog or kept grass, hay, straw, oil-cake, corn, both dry and green, are in modern use, for the winter support of sheep; for the summer, the natural and artificial grasses, green beans and peas, tares and chicory. Melilot has been recommended at various periods for these thirty years past, but we are yet without any experiments of its use. Burnet is an excellent winter grass for sheep, upon soils where it will grow, which, according to my experience, is rather uncertain: it should never be fed but in winter, or rather early spring. A small plat of parsley is convenient in a medicinal view, for dropsical, consumptive, or scabby sheep. Turnips are now generally the grand dependance upon poor soils for winter food; they are yet doubtless a poor and watery diet, at best, still more so, on poor land. The Rutabaga or Swedish turnip is preferable to our own in two very important respects, it is more substantial and nutritious, and almost impenetrable to the frost. Its disadvantages,

real and suppositious, are as follow—there is difficulty in obtaining good and genuine seed, and the rutabaga requires a better soil than our common turnips. Many farmers to whom I have recommended the former, particularly Mr. Thornbory, of Thornton Stewart, Yorkshire, have complained, that they do not obtain from it the quantity per acre, which the common English turnip produces; but it is probable, they have not taken into the account, either the superior specific weight, or more nutritious quality of the Swedish turnip, determining merely by the larger individual size of the English; now notwithstanding that circumstance, the acreable weight of the Swedish roots may be far superior, and I am in daily expectation of an account of the weight of an acre of rutabaga, from a distant county, the report of which is of a magnitude totally unexpected. The various disappointments lately suffered have induced Mr. Gibbs, Seedsman to the Board, whose attention to the quality of his seeds I have so often, and as I have hitherto experienced, so justly commended, to import some fresh seeds this year from Sweden. By an occasional attention of this kind, we may expect to obtain the rutabaga in perfection, an article, in fact, far superior to the common turnip in goodness, and even approaching the quality of the carrot, upon rich, dry loams: this discrimination, however, is necessary, where good crops of carrots or parsnips can be grown, we should lose by the best crops of rutabaga.

Our LAMBING SEASON, for the most part, may be said to commence soon after Christmas, and to continue throughout the spring. The ewes generally shift upon the fallows and wastes, but whatever kind of stock they may be, or however made to shift in general, a farmer who knows his own interest, will endeavour to get them in good heart towards their lamb-

ing time; at which critical season, starved ewes may be so feeble, as absolutely to be without throes, or ejective powers, to bring forth their offspring, and in this miserable state they perish together, in the storm, the snow, or upon the wet earth. It is here that nature requires the fostering hand of art. The shepherd should always be prompt with his manual assistance to the ewe which may need it, in her labour, and he should be mindful to act cautiously and gently, following the indications of nature. The old practice confined the ewes to lamb within doors, a rule at present followed upon the continent, but however exposed the flock may generally be, it is certainly indispensable, that the ewes about to lamb, should be driven to the most dry and sheltered pastures, where they may have the best keep the farm or walk will afford. The shepherd will now exert himself to save the weak lambs, holding them up to the teat, providing those which have lost their dams, or in fine, taking those home to nurse, which are too far reduced to exist abroad, which if debilitated by cold, must be wrapped in woollen, and thrust into a warm hole in a hay stack, or have the benefit of moderate artificial heat, the universal preservative of that degree of animation which may remain in young animals of every description. The ancient writers recommend to draw off the *colostra*, or first milk, vulgarly called beestings, from the erroneous notion that it would injure the lamb. Sometimes from cold, or other causes, the udder of the ewe is inflamed, the milk cores, and the lamb is unable to draw it, or the orifices of the teats are obstructed by a waxy substance. These defects may be occasioned by the lamb being too weak to suck, whence the udder becomes inflamed and obstructed by too long retention: in this last case, the vigilant shepherd must be careful to draw off the milk,

unless he have at hand a lamb in want of milk, and it is safest to confine the ewe whilst sucked by a strange lamb. The remedy for an inflamed udder will be found in its proper place.

I have often wished it were more practicable to keep a stud-book for a flock of ewes, as we are accustomed with the larger animals; for great mistakes are made, respecting the precise time at which the ewes will drop their lambs, and many are lost in consequence under the common system, being lambed in the night, perhaps in a fold where they are trodden to death, or in the deep snow, or in some exposed place, where they are caught up by vermin. The shepherd now must watch his ewes night and day, during a succession perhaps of five or six weeks, a dreadful duty, in a rigorous climate and exposed situation. It is even necessary to visit the flock at midnight, for the purpose of arousing the ewes, indolent and torpid with cold, and of obliging them to stand and suckle their lambs, which might otherwise perish for want of sustenance and comfort.

In very young ewes, the teats are sometimes so tender, that it is with difficulty they will admit their lambs to suck, in which case, the best method is to confine the ewe with her lamb, until the difficulty cease: the same with a stepmother, to which last when again turned out with the lamb, regard must be had that she does not desert it, to prevent which they sometimes *hobble* the ewe, as it is termed, by tying her hinder or her fore leg for a few days. A twin will, of course, be given to the ewe which has lost her lamb, but should the ewe be in her first milk (*colostra*) and the foster lamb of an age beyond the period when such milk is proper, the ewe's udder should be drawn clean. Ewes with twins should be kept awhile by themselves, as such are apt to lose one

of their lambs. It is convenient at this season to have a reserve of cow's milk for an occasional want, but it is generally given boiled to lambs, being otherwise apt to gripe and purge them, when very young. The putting a strange lamb to a ewe, it ought to be remembered, is sometimes a matter of difficulty. I have known an instance of singular obstinacy in the case: a lamb was confined with a stepmother which was found a few hours after, butting the little stranger to death; it was however saved, and the skin of the ewe's deceased lamb sewn over it; she then permitted it to suck, but after a while, detecting the fraud, from the artificial covering becoming loose, she once more attempted to kill the lamb, nor was she reconciled to it, until after a considerable time; hence the necessity of confining the ewe by the head with a strange lamb.

Many years since, I recollect the following circumstance. There was a lamb in the flock, remarkable for its fine size and roundness of barrel; this roundness seemed to increase daily, until about the third or fourth day, the lamb was observed to stagger and strain very much, and to make a great quantity of urine. The bailiff who was inspecting the lambs, ordered the shepherd to catch this, and on examination, it appeared to have no vent for the excrement, the skin being continued over the orifice of the anus. The shepherd perforated the part with a sharpened stick, and the lamb continued to be the finest of the flock. From these few hints it will be at once perceived, what demands must necessarily arise on the vigilance of a shepherd, and how imperfectly he will be able to perform his duty, to an immense, straggling, promiscuous flock, under little or no system or controul.

As we are now treating of sheep at the season when they require our greatest care, I will briefly give the outline of that plan which has invariably appeared to me preferable to all others, in point of safety to the flock, in course of profit to the farmer. To every farm yard ought to be attached a SHEEP YARD, or home fold, completely fenced in, and either totally, or in sufficient part, surrounded with sheds composed of faggots or any cheap material, excepting furze, which may damage the wool, thatched and secure from the weather. The sheds to be closed up, having windows for the admission of air, to as great an extent as may be judged necessary, the remaining space to be left open. The whole to be divided into pens for the needful separation of the flock. The bottom to be laid with chalk, well littered, and I think it is better for the health of the sheep, that the dung be frequently cleared away, rather than suffered to remain a whole season as usually practised in coting. On extensive sheep farms, as many of these covered folds, in the most convenient situations, if surrounded by plantations the better, as are necessary in order to completely secure the whole flock. The most convenient part of these folds or enclosures, must ever be reserved for the first ewes expected to lamb, and thither they must, after selection, be driven and confined in good time; and so on, in succession, by which a numerous train of risks and mischiefs may be avoided. If the sheep must in general go out to feed from necessity, yet the occasional use of these folds will assuredly render the largest proportional profit of the whole sheep system. And I greatly prefer keeping sheep of all descriptions at home in the fold, wherever a constant supply of provender can possibly be stored, advantage being diligently taken of fine weather, to lead out the flock for air and exercise. In feeding,

the sheep should be divided into lots, sufficiently small, and properly assorted as to strength and condition. In grazing abroad, upon inclosures, the practice of division into small flocks of strong and weak, is excellent, and productive of numerous advantages unattainable in the old system.

To return to the LAMBS newly fallen, the ancient practice was to keep them within doors, until they had acquired sufficient strength to follow their dams abroad, an usage long become obsolete, and indeed no farther necessary, than in the case of severe weather, or of weakness in the lambs, when nursing them will ever be found the most speedy and certain restorative, notwithstanding all the pleas of indolence to the contrary. To counsel that the suckling ewes be fed with the best food, in the farmer's power, is to repeat what every one knows; it is to somewhat more purpose to say, that the articles should be at once productive of milk, and of substantial nutriment, for these animals are too often fed with such loose and washy meat, that what with the floods of watery milk and of urine, which are excited, they are reduced to skeletons, before the weaning time arrives, and are not easily recruited afterwards: a plenty of such food, however, is far better than starving whilst they suckle, because in the latter case, they do not always reach the weaning time; and few experienced shepherds, in certain districts, but have too often witnessed the horrid sight of a starving lamb tugging at the teat of its expiring mother!

HAY is so precious an article in a severe season, that on viewing a piece of fog, or kept grass, trodden into the earth and made into dung, I have more than once regretted that it had not rather been made into good wholesome and fragrant rowen or after hay, of which kind, that of Middlesex, I think, is the most beautiful

in sample, and the most excellent in quality we have, although generally grown upon harsh, unkindly clay. Turnips, especially those of poor soils, produce weak milk, and when they become decayed, are apt to occasion dangerous scourings, or fluxes, in the ewes, the preventive of which is to allow hay, or even good straw, of which oat and pease straw have the preference; a pease stack cut like hay, for this purpose, is of supreme use, where it can be afforded. Similar precautions are proper with rape, or washy fog. The highest style of keep for an ewe flock, is with parsnips, or carrots and hay; or an allowance of barley, pea, or bean meal, or malt combs, with turnips or fog, potatoes or cabbage, &c. with hay. If the stock be of good quality, they will pay better for such than for ordinary keep.

It matters not how early the lambs be CASTRATED, provided they be strong and in health, otherwise the business had better be deferred until they gain strength. This common operation is safely performed with the teeth of the shepherd or leech: dry and moderate weather is most suitable, and the newly gelt lambs should be kept from getting into ponds of water, to which they are sometimes inclined, and which may kill them, by bringing on cold and inflammation of the parts: in unfavourable weather, they would be more safe under shelter, provided they could be kept moving about.

The WEANING of lambs takes place at the age of three or four months; indeed it is a matter of very slight consequence in inferior flocks, where the rams run with the ewes, as these will drive the lambs from them, on becoming again acquainted with the ram. The lambs well accustomed to graze with their dams, will suffer little loss of flesh, on separation, if turned into good feed, otherwise they will *pitch*, and being

checked in their growth, at a most important period, will never again thoroughly recover, under even the best treatment. Should the udders of any of the ewes swell, and become inflamed, on separation from their lambs, such should be carefully selected and relieved by occasional milking, and if necessary, the proper repellent applied. The ancient custom of MILKING the ewes for profit, after weaning the lambs, is probably abolished throughout this island, with the exception of two or three instances, in Scotland and Wales; indeed the practice could only consist with an unimproved state of society, in which the most trifling aid or profit is acceptable; at present it would be a losing game indeed. It is necessary, however, to be cautious, in admitting the lambs to very rich and succulent food, lest they *heave*, or surfeit themselves into those disorders which arise from too quick feeding and an over fullness of blood: this will be best effected by turning them into the rich pasture with appetites already satisfied in part, and by attending in order to keep them gently moving about the field. It is the custom upon some poor land districts, to send their lambs to vale farms or marshes, to fatten or bring them forward. Where lambs are reared at home for wethers, they rejoin the flock in autumn, and the unfortunate blunder is not seldom committed, of suffering them to lose by poor winter keep, the advantage in growth and condition, which they had attained in good weaning pasture. The sale of grass lamb, in course, succeeds that of house lamb, as the former is succeeded by the sale of store lambs at the autumnal fairs.

I have yet seen no reason to change my opinion, as to the practicability or profit of SUMMER-FEEDING sheep with cut grasses, in convenient folds, either at the home-stall, or in different parts of the farm. Such

is the invariable practice with many large flock masters upon the continent. Granting that sheep must be indulged in a short and fresh bite, they may be accommodated in that point, during their hours of necessary exercise. Over and above the great saving of keep, the advantage of sheltering the flock in hot weather, and of holding them under constant easy inspection, at a very critical season, would be truly great, and indeed sufficient to outweigh almost any objection.

Rearing HOUSE-LAMB. This branch of sheep husbandry prevails most largely in the neighbourhood, or within a convenient distance of the metropolis, and may succeed to a certain extent within reach of any considerable market town. In the counties around London, western horned ewes have been preferred in the business, as the best milkers, for a century or two past; at present the Dorsets are particularly chosen. Forty or fifty years ago, a certain technical slang, now I believe become obsolete, was in common use in the suckling houses of Essex and Herts. Thus, those suckled by strange ewes were called *twin bastard* lambs. Ewes which suckled strange lambs were called *bastard ewes*. Sucking the first of the milk was styled *sucking at head*.

The first object with a view to this business, is a good and convenient house for the ewes and lambs; warm, yet airy, and divided into pens. The lambs to be well littered, kept in a state of extreme cleanliness, and not crowded too many together, attended with punctilious regularity as to the feeding hours, and their stomachs well satisfied, without being overloaded. The suckling house in course, consists of pens, according to the number of the lambs, and a sheep room, in which the sheep stand to suckle a lamb on each side, held by the head when necessary, the

shepherd pinching the ear or jaw of the sheep, as we do with a horse, to restrain its motion. As many lambs are brought forth as can be conveniently attended; when filled, they are put into a pen reserved for the purpose, and when all are satisfied, they are separately arranged in their proper quarters. A shepherd will thus attend five or six score ewes, having a little occasional help abroad. The ewes ought to be the best milkers that can be procured, and to be fed with the most nutritious and succulent food. Such are the chief conditions, subject to which, providing the market with house lamb, is a profitable concern.

The best method is for the dams to lie in the house by night, with their lambs, the former to be turned out early to feed, either in the yard or pasture. The suckling hours, six or seven in the morning, ten, three, and seven o'clock at night, making four times in the twelve hours. Lambs, like all other sucking animals, are subject to acid crudities in the stomach and indigestion, which will prevail sometimes to that degree, as totally to prevent their improvement; in which case, care must be taken not to overload their stomachs, and to suffer such to have only the first or thinnest of the milk; they must also be encouraged to feed. The udders to be sucked dry by the strongest and forwardest lambs. Food for the lambs, meal of barley, or wheat and pease ground together, with fine hay. The tails and udders of the ewes to be clipped and kept perfectly clean, nor should they be driven far for their food, for fear both of the foot rot, and of decreasing or rendering their milk poor and watery.

I take it for granted, that every flock master is well enough convinced of the absolute necessity of a daily INSPECTION and enumeration of his sheep, a species of stock liable to more casualties and diseases, than any other: he ought to be convinced also, that *prevention*

is ever the cheapest and most certain cure: thus if the case have at all the semblance of being desperate, the knife, in the first instance, at once puts the matter out of hazard and saves waste. The next point is *separation*; home if needful, and real earnest, not hesitating, fiddle-faddle attendance, when recovery from any malady or mischance is aimed at. Sheep, in the common method of keeping them, may be hung in the brambles by their fleece, cast between high ridges on the fallows, or in a ditch, buried under the snow, or in the summer time, may be suddenly stricken by the fly, in which case, the proper remedy must be immediate, or the animal may be lost. As a preventive, no part of the skin ought to be left broken, but if any accident has produced that effect, the sheep must not be trusted abroad without the proper application to the part.

The objects of ANNUAL INSPECTION, for which, perhaps, the beginning of October is the most convenient season, and with which should be associated the account of PROFIT AND LOSS, are the state of IMPROVEMENT OR DECLINE in the breed; the propriety of KEEPING ON, OR CHANGING STOCK, OR PLAN; culling and dismissing WORN OUT EWES AND RAMS; selections of lambs and wethers for SALE, STORE-KEEPING, OR FATTENING; examination and election of YOUNG STOCK FOR BREEDING. With respect to young rams, as their form can seldom be distinguished until they approach the adult state, it is necessary to preserve a considerable number from early castration, out of which to chuse, at the time of inspection. As many of those of the best form, and truest to their blood, as may be wanted, must now be reserved for the service of the flock, and the remainder castrated; which it is perhaps preferable to fatten for the ensuing spring market, since, if kept to greater age, they usually become coarse and ram-

mish. All those of the young ewes, which are liable to objection, in respect of form or wool, must be forthwith discharged, and if the number retained be deficient, it must be made up by purchase of the same species. If the stock be of an improved or good description, there will seldom be found any individuals with coarse mouths, generally denominated *dog and pig-mouthed*, but should there be any such, they are to be rejected from a breeding flock. For the principles of improvement the reader is referred to page 25. A segregation should likewise be made of all THE WEAKLY OR DISEASED SHEEP, that, being secured by themselves, they may not be liable to injury or retardment, from the robust and healthy.

GENERAL RULES in the management of a flock. Sheep require DRINK when at straw, or dry meat of any kind, if it be grass dried up by the dog day heats. They should not be turned into pasture, in the autumn or winter, until the heavy dews or hoar frost be exhaled, which frequently does not happen until late in the day, and sometimes not at all. In this way sheep are immensely injured, and great mortality ensues, particularly in the northern parts of the island; the great quantities of chilling and unwholesome water which the animals take into their stomachs, with the grass, induce flatulent colic, diarrhœa or scouring, and intermittents, ending in a general waste or consumption. The only palliative remedy, where no means exist of supporting sheep, but by this exposure, is to allow them hay in the morning, or to fill them with straw. Sheep, in truth, are good straw yard stock, but unless the straw be bruised for them, it is apt, by its harshness, to damage their mouths, on which account, the straw from the thrashing machine suits sheep. It is a very old rule, to drive the flock over the dewy field, in every part, previously to suffering them to feed, in order to brush off as much as possible of the moisture

from the top of the grass; there is another ancient injunction not quite so rational, which many of the moderns have copied, namely, to keep the flock with their heads to leeward, or from the wind, lest it should enter their stomachs, and occasion flatulence, an insignificant notion, generally entertained with respect to human stomachs. People about to expose themselves to the air, take spirits or cordials, the grand promoters of flatulence, in order *to keep the wind off their stomachs*; now the wind in their stomachs is of a nature specifically different from the external air, nor did it proceed from thence, but was generated exactly where they find it; and with certain exceptions of extreme laxity and debility, where the substance of the stomach feels to the patient, like wetted paper, the best method of getting rid of wind, and of preventing its access, is to take exercise, on horseback in preference, in the open air, with the stomach empty.

Barnaby Goge, says, [p. 141, book iii.] “They must be well ware in the driving of them, and ruling of them, that they guide them with their voice, and shaking of their staffe, not hurting nor hurling any thing at them, nor that they be any time farre off from them, and that they neither lye nor sit: for if they go, not forward, they must stand: for it is the shepherd’s office to stand alwaies as nie as he can, that he may plaine and easily discerne, that neither the slow nor the great bellied in laming time, nor the quick nor the lively while they roam, be severed from their fellowes: and least some theefe or wilde beast beguile the negligent shepherd of his cattell.”

The Arabian writers insist, that sheep have an ear for music, and I have either fancied, or really observed, something like it; however, custom might render it familiar and even delightful and attractive to them,

and the shepherd's pipe, as of old, might serve at once to divert his own solitary hours, and gently to soothe his flock into obedience. The Arabians and Turks, so famed for their humanity to beasts, are equally remarkable for their full share of the natural inconsistency of the human mind. The Arabian, who reasons with his horse, and would shudder at the idea of striking him, is totally unconcerned at witnessing the tortures inflicted upon the animal, by the infernal curb, which in checking him, fills his mouth with blood: and the Turk, who would not, for the world, hurt a dog, consigns thousands of them, without pity or remorse, to a lingering death by famine, or the devouring of one another.

On the use of SALT. It is remarked by the old writers, that, "the shorter and finer the grass, the fitter it is for sheep; yet there is no pasture so good or so fine, but with continual use your sheep will be weary of it, except the shepherd remedy this fault by giving them salt." Doubtless the short bite is sweet and preferable for sheep, and it has been well and truly said, that "the harder you stock, the more grass and the more sheep you may keep:" farther, hard stocking with sheep will render the coarser grasses fine, a most useful memento in many situations. But as all advantages have their concomitant disadvantages, there is such a thing as *stenching* the grass, that is, defiling it with such vast quantities of dung and urine, that the sheep lothe it, and even the young and rank grasses produced by this superabundant manure. In this case, I apprehend, a fresh and wholesome pasture is of infinitely greater consequence than salt, which, there need be no doubt, owes its great celebrity as a panacea for cattle, rather to ancient authority, than to reason or experiment; indeed the truth of this position, is amply proved by British practice. Of

the medical virtues of salt, however great they may be, I know not, that we have any right to speak with greater certainty: we prescribe it after the ancient writers. Aristotle, as far as I recollect, is the oldest writer who recommends salt, and he prescribes the allowance of a peck every five days, to one hundred sheep, in the summer season, which, he promises, will keep them always healthy and in a thriving state.

On grass, or layers, which will occasion the rot. Grass which springs up suddenly, in swampy soils; also corn which shoots among the stubbles, after harvest, particularly barley, is said to be dangerous to sheep. Wet, unsound fallows. Lands which have been flooded. Bakewell was strongly of opinion, that flooded lands and their premature, unsubstantial herbage, ever occasioned the rot, which was never induced by rains, the water of which did not flow, or by springs. It seems, he could rot his sheep at will, by flooding his land, which he was in the habit of doing, with such of his improved stock as he wished to keep out of any other breeders hands. It was only necessary to flood a pasture in summer, which, in consequence, would infallibly rot the sheep in the ensuing autumn: land flooded after the middle of May, of whatever kind the soil might be, would, in his opinion, infallibly rot sheep. In Derbyshire lime-stone land is said to rot sheep, and that you may make any land have that effect by liming it.

“ In places subject to rot, fold sheep before the dew falls, and keep them in fold until it exhales, spring and summer; feed with hay, &c.—No ewe ever rots whilst she has a lamb by her side; place sheep that have the rot where they can get at the bark and young shoots of elder.” *Bath Papers*. The nature and course of the *hunger-rot* are sufficiently defined by the name. The MIDSUMMER ROT is said to be the most

fatal, because at that period the sheep can obtain the greatest quantity of wet unwholesome grass which is the cause of the malady. The autumnal or MICHAELMAS ROT, supposed nearly equal in danger to the former and for similar reasons. The earth washed by floods from the sides of hills or of the ridges of fallows, taken in large quantities with the grass into the bodies of sheep, deer, or other cattle, said to rot them. Heavy rains, especially if attended with hail, or a moist, foggy, sultry and stagnant state of the atmosphere in summer, sometimes produce a very sudden putrescence of the humours in sheep, which is then denominated the *swift rot*. The water being saturated with putrid juices from the bodies of insects or other causes of putridity, said to have similar effects. To drink water much impregnated with hail has been generally supposed unwholesome for sheep, but I should judge must affect them in a very different manner to that which has been described above.

It had been an old opinion which Ellis repeated, and many others after him, that in driving a sound flock of sheep across the country, if you suffer them to lie but one night on a wet piece of ground, even in a hill or chiltern district, you run a very imminent risk of rotting them: the same effect will ensue from their lying in the low wet and boggy parts of the commons or pastures at home. I know by experience the truth of these positions, and whether accidentally or not I cannot tell, but I have seen more Dorset sheep injured in this way than any other breed. I however dissent entirely from the general opinion as to the proximate cause of the rot which ensues, and which is supposed to be the grass eaten by the sheep in these wet places; on the contrary, I am inclined to attribute the malady to cold caught by the animals in the wet layer, and afterwards neglected: for I

repeat, catarrh followed by glanders is a very common cause of the rot, and I have witnessed the progress of the disease in a great number of instances. Sheep are particularly subject to catarrh, and its most malignant effects are very speedy with this species of animal. I think it utterly improbable that feeding a few hours only upon the grass grown on wet land could produce such considerable effects; in fact, I well know, from a multitude of proofs, that sheep may occasionally feed on such with impunity: nevertheless a continuance of crude watery food would infallibly rot them.

The methods of PREVENTION in all the above circumstances will readily suggest themselves. Should necessity oblige the farmer to feed his sheep on swampy grounds, wet fallows, or lately flooded lands, two precautions may ensure the safety of his flock; namely, not to suffer the sheep to rest, far less to remain on such dangerous layers, but to pick as much grass as much be judged expedient, and then be immediately driven either to high and dry grounds or folds where they may rest, particularly by night, and receive a sufficiency of dry food, hay or straw, which by its absorbent property may counteract the ill effects of the washy herbage on which they have been previously fed. I do not recollect the occurrence of any mischief to sheep from being occasionally fed in bottoms, under these precautions, which are also of great use during continued summer rains, however good the soil and its produce may be.

In feeding down GREEN CORN by sheep, the old rule was not to turn them into rye after the first, nor into wheat after the middle of March, lest being too rank they should occasion scouring, an effect, however, which green corn will invariably have at first, as well as rape and turnips, which last, and more especially if

poor or decayed, are extremely dangerous to sheep inclining to rot. The proper and safe method with these green articles is to accompany them with dry food, and to restrain their immoderate use, on which account, I have wished it were practicable to mow the green corn, and to soil the cattle with it, as in summer.

DOCKING or curtailing of sheep is of unquestionable use since they are so liable to foulness behind, although in some counties, in Dorsetshire particularly, the tails are left entire. Natural length of tail has been formerly noted as a mark of specific distinction, but I am not informed concerning it. There is also another measure of prime utility, and practised by the best sheep-masters, both of old and at present; it is to TRIM the sheep behind against the approach of hot weather, which keeps them clean and cool, and prevents disagreeable accidents from filth and the fly. The drawing of Mr. Culley's wether in Bewicke's *Quadrupeds*, a book of great merit, and most pleasing in a country family, exhibits a sheep neatly trimmed behind. Mr. Ellman's practice is to clip off the coarsest of the wool on the thigh and dock, a month before washing and shearing, which he sells at an inferior price as locks, the quantity amounting to about four ounces per sheep. The UDDERS of all breeding ewes should be constantly kept close trimmed, which prevents the danger of cold sometimes consequent upon trimming them a short time before lambing; but at any rate they should not be suffered to go to suckling with foul and woolly bags, which become inflamed and chafed, and so tender that the ewes will not suffer their lambs to come near them. And indeed, rather than additional, it may eventually turn out a great saving of trouble to keep the whole flock entire in skin, by preventive cleanliness or timely

application of the proper remedy to any accidental breach.

Loss of wool from brambles and furze should be guarded against as much as consists with the nature of the pasture; indeed this loss is of more consequence than generally supposed, and on heaths abounding with furze, and in green lanes, I have known it a common practice for the labourers wives and children to glean wool, in considerable quantities, which, if gathered before rain came, they sold at a good price. In driving sheep to different parts of a farm, their fleeces may be damaged: I have known a careless young rascal chase a flock along a narrow lane, when from their jumping and crowding together, the bushes on each side have been covered with wool.

Sheep are sometimes bitten in the udder or legs by VIPERS AND EFTS, and many have been so lost, there being no certain remedy among those we have to recommend. Here again prevention is worth all other remedies. The shepherd ought to know the chief haunts of those useless as well as venomous reptiles, and take every opportunity to destroy them; in the mean time a true vermin cur should occasionally hunt over the suspected ground whilst the sheep are upon it.

In feeding for THE BUTCHER the advantage will be immediately perceived of a store flock to follow the fattening one in order to pick up their leavings, which must else be wasted, or the latter be compelled to eat stale refuse, to the hindrance of their proof, which will always be accelerated by allowing them prime and unsullied food. This respects feeding in the inclosures where the head of grass being well taken down by the first flock, the finishing close bite may be left to the stores or breeding flock. I repeat, for I know not what number of times, the plan of cutting the green meat for sheep, or soiling them, wherever practicable.

The method of HURDLING OFF daily a portion of turnips, so well known and commonly practised, is certainly far preferable to turning in a flock to range over the whole field, pick and cull the sweetest, to bite, reject, urine and dung upon the remainder, and stamp them into the earth, although this method, however comparatively advantageous, is far inferior to drawing the turnips, which I have already so strongly recommended: in fact, turnips hurdled off are much trodden and wasted, and some sheep are very troublesome in leaping the hurdles. Mr. Bartley is unquestionably right, in his preference of potatoes to turnips, as a general sheep food, saving and excepting the powerful objection, that they are not so easily obtained. I see no reason why the hurdling practice should be confined to the turnip crop, it might be extended to the grasses.

The various articles of SHEEP FOOD, adapted to every season, have been noted. The general good price, afforded by the spring markets, ought to be an encouragement to winter fattening, from which results so much excellent manure. I have a good opinion of baked potatoes for sheep fattened in the home fold, and I have lately heard of a cheap and convenient kiln for the purpose of cooking them, which I am sorry I am unable at this time to describe. Many wethers I believe have been fattened with barley meal, as an article become very plentiful, this last winter; an allowance of such solid food, with roots or greens, must at once make quick dispatch in fattening, and produce the best mutton. The most convenient vehicles of the food, either for home or field use, are the trough and rack joined, the latter in height about the level of the sheep's head; the trough parted in the middle, as sheep feed on both sides; the whole steady

and firm on the ground. A sufficient number of these racks should be provided.

Sheep will eat, upon an average, twenty pounds of TURNIPS each, in twenty-four hours. An acre of good turnips in the field, between November and March, will keep one hundred sheep six weeks. One gallon of raw potatoes will suffice a sheep twenty-four hours, but some will eat much more. Fourteen hundred sheep will eat up and spoil an acre of good TURNIPS in a night. One acre of good grass will suffice five hundred couple a day. Of the quantities of HAY AND CORN, which a sheep will consume daily, I do not immediately recollect any accurate experiments; but I believe an ewe will eat some pounds of hay within the twelve hours; and to feed liberally, one hundred sheep, with this precious article, throughout the winter season, ten ton, at the least, would be required; although I have lately been informed by a great sheep master, that he allows but that quantity to a flock of one thousand, his turnips being excellent, with plenty of grazing ground. The allowance of a pound of hay per day to a sheep, according to the practice or idea of some feeders, must be rather for the name of the thing, than any possible utility; and perhaps from its insufficiency, that quantity is simply thrown away. As to CORN, a large sheep will eat several pints, or pounds, per day, and the comparison of quantity of food between the sheep and the ox, may be generally stated, at one eighth or ninth part for the sheep. A notion has been long current, that Wiltshire sheep are the most proper for corn feeding, the real ground of which is, old custom has elected that species for such high keep, for in fact, no food agrees better than corn with sheep of every species.

The following quantities eaten by lots of six several

breeds of sheep, according to Mr. Billingley's well known experiment, in 1792, will give the best idea on this subject. As they were fed to determine the superiority of proof, it may be presumed they had their bellies full.

5 *Leicester Sheep* eat from April 3d to 10th—Cabbages 29lb.—Hay 91lb.

.....June 20 to 27—Green vetches 840lb.

.....Decem. 1 to 8th—Cabbages 445lb.—Hay 35lb.

5 *Gloucester Cotswold*.....April 3d to 10th—Cabbages 29lb.—Hay 120lb.

.....June 20 to 27—Green vetches 1050lb.

.....Dec. 1 to 8th—Cabbages 615lb.—Hay 51lb.

4 *South Down*.....April 3 to 10th—Do. 29lb.—Do. 70lb.

.....June 20 to 27—Green vetches 750lb.

.....Decem. 1 to 8th—Cabbages 388lb.—Hay 41lb.

5 *Wilts*.....April 3 to 10th — Cabbages 29lb. — Hay 125lb.

.....June 20 to 27—Green vetches 1035lb.

.....Decem. 1 to 8th—Cabbages 516lb.—Hay 42½lb.

5 *Dorset*.....April 3 to 10—Cabbages 29lb.—Hay 123lb.

.....June 20 to 27—Green vetches 1050lb.

.....Decem. 1 to 8th—Cabbages 526lb.—Hay 43½lb.

5 *Mendip*.....April 3 to 10—Ditto 29lb.—Ditto 87½lb.

.....June 20 to 27—Green vetches 870lb.

.....Decem. 1 to 8th—Cabbages 417lb.—Hay 41lb.

In this experiment, the Mendip sheep paid most money for the food they ate, but on that, the grand point, nothing was satisfactorily determined; the fate of various single experiments. On SOILING sheep, I omitted to state the old objection, that they will eat the leaves of the artificial grasses and reject the stems, which they will also do, when turned into the feed, if the grasses be forward and high; it shews, that in

either mode, such grasses should be taken in time for sheep, and that in case of fat sheep, store followers should be fed on the refuse stalks.

SHEEP SHEARING is performed twice a year in some, chiefly warm countries, a practice which perhaps has never equalled the common method, either with respect to the quantity or goodness of the wool, nor has shearing lambs been found advantageous. In France the experiment has been made of suffering the fleece to remain unshorn three years; the result was an equal quantity of wool and of equal quality with that shorn annually, nor were the sheep injured, which however might well be the probable consequence of such a practice, the interest of money also must be an adverse consideration; how far the greater length of staple in fine wools, to be obtained in this method, might or ought to operate in its favour, I am uninformed. It has been stated that in Iceland, and the Shetland islands, they have a breed of fine-woolled sheep, which require no shearing, the wool being shed spontaneously, or plucked annually, without pain to the animals. Columella mentions the same property in certain of their covered sheep, those of Greece, I believe, whence probably the race may have found their way northwards.

JUNE seems to be the general shearing month, in this country, and where no extraordinary precautions are taken, the business had better be delayed until towards Midsummer, more especially in cold, backward springs, because in such seasons we seldom, until that period, have any settled warm weather; besides a more perfect fleece is obtained, and fuller of yolk, from the perspiration of the animal.

There is a common practice of previously shearing the fat sheep sent to market, early in the spring, but it is a gross cruelty for the chance of a trifling profit;

I am sorry, however, to say, that as yet, justice and feeling towards brutes have no place or meaning in our vocabulary of profit; that they have not yet been sufficiently reflected upon to be even understood. On viewing a drove of naked sheep in March, going to market, the north-east wind cutting like ice, and freezing the very current of the animals' blood, their eyes gummed up, and inspissated mucus adhering to their nostrils; I have most piously wished for the honour of driving a flock of their owners, also in *puris naturalibus*, or stark naked, the same journey, and at the same rate, to view the sale, and share the losses as well as the profit of their sheep. Seriously, I think this method a losing game (by far my best argument) since from the cold probable to be caught even in favourable weather, from such a loss of clothing, the animals must be considerably injured, but if unfavourable weather ensue, their deterioration, both in weight and quality, is certain. I have often had the opportunity of examining this matter in Smithfield, and with more attention the present spring, than before; one market-day in particular, about a month since, when it was extremely cold. Many lots of shorn wethers appeared to me to have lost full a stone a head, being in a perfect state of disease from catarrh, whilst the unshorn ones were in a brisk and healthy state. Consulting a cutting butcher afterwards on the occasion, he expressed himself entirely of my opinion, observing, that no man ought, or could afford to give the full market price for sheep in such a state; that he had killed some, to use his own peculiar phrase, "the blood and fat of which were curdled together like jelly," and that their flesh was as dry as a chip, and without flavour. He further remarked, that the common notion of sheep not tra-

velling well in their fleece, in the spring, was groundless, and indeed so I have found it.

WASHING previous to clipping the sheep, is the general custom, with few exceptions, in this country; indeed it is proper with all long-woolled sheep, but not so easily practicable with the matted, greasy and impenetrable fleeces of the Spanish and carding-wool breed, whence in Spain they invariably shear dry, as has been the practice in Devonshire, with the short-woolled sheep for centuries. Mascall says, "In Devonshire, they never wash their sheep, when they clip. After they wash their wool before they spin it, in warm lye, and dry it on hurdles." As to the time of shearing, he says—"The best is, to consider when the sheep cannot endure cold if thou shear him, nor heat if thou shear him not."

With fine-woolled sheep upon the continent it is generally made an object to increase by art as much as possible, previously to clipping, the yolk or grease among the wool, and in Spain and among the least enlightened sheep farmers of France, they annually act over the execrable tragedy of the Black Hole, by confining their flock to sweat for several days and nights before shearing, in such close quarters, that sometimes a score or upwards will perish in a night by suffocation. Surely if such a loss should occur but once in seven years, independently of the damage done to the health of the surviving sheep, it must detract somewhat from the expected advantage of this notable method of enhancing the value of wool.

Mr. Collins, before quoted, (*Bath Papers*,) informs us, that the yolk in an English short-woolled fleece of three pounds, will be nearly a pound and half, which is the customary allowance to the wool buyer; and that if any sheep has escaped washing, and is shorn

in the yolk, much harm is done to the fleece when hard washed, as it mixes the fine and coarse wool together, so that they are afterwards scarcely separable; that it is worse still, to mix with good wool, that shorn from a dead skin; such articles ought to be kept separate for home use, blankets, mops, &c.

It is fortunate to have a fair and dry time for sheep washing, and dry pasture, or a clean dry yard are the most proper places for the flock after the operation; if housed in case of rain, they are liable to have their wool soiled. They may remain two or three days until the wool be perfectly dry, although in late shearing, I have known them washed in the morning, and clipped the same day. Clean washing and fair winding will always command the best market price; the advantage of selling dirt for wool, will not probably be obtained more than once or twice. It is not an object altogether unworthy attention, to have a general regard to keeping the sheep as clean in the fleece, as circumstances will admit, in particular when they are not folded. The ancients were so much of this opinion as to wash their sheep frequently, with the view of cleanliness and the promotion of health.

The danger, I think, of sheep catching cold from washing, is not so great, as from the loss of their wool afterwards in shearing, but if it should happen from a sudden change to cold rain, that they are affected at first, they become doubly susceptible after shearing, and it is a case particularly to be guarded against, by giving them comfortable quarters, and shelter if the weather be cold or wet, and even medicine to any which seem to droop. The ancients were accustomed to smear their sheep after shearing, with a certain composition, in order to prevent or cure the scab, or drive away the fly; this was afterwards

washed off with sea water, or water salted. I have lately observed some of the spring-sheared sheep with a coat of ointment, composed, I suppose, of red oakre and oil.

The method of WASHING must vary with local convenience. In some parts of Kent, sheep are washed in the Thames, a barge-load of them being put afloat to a sufficient distance, and then put overboard, whence they swim ashore. They are thus sufficiently washed, requiring indeed very little in so clean a country; but it is otherwise with folded sheep, and upon layers where the wool is much matted and soiled, and where it cannot be made clean without manual assistance from the washers; under such circumstances, I have not hitherto seen sheep washed to my satisfaction, more time and labour being requisite to that end, than most people are disposed to allow. A stage for the men to stand upon is a necessary convenience.

Improved shearing, were it more general, would be a considerable national benefit, for in the old hasty and careless way of clipping, from one to four ounces of wool are left upon the sheep. I have not been able to trace the meritorious inventor of *circular* shearing, but have reason to believe, the method originated in the north. The best practice in the kingdom is probably to be seen at this day, on the farms of Messrs. Culley and Bailey, in the north: in the south, at Woburn and Holkham, and in Sussex. In some parts of Scotland, I think, I have heard of complaints of Mr. Culley's method, as too perfect, leaving the animal naked and exposed for the climate. In the mode of treating the sheep, during the operation, there is, in most parts, much yet to amend, as I too well know, and as the following quotation will further evince, being the substance of memorandums made

by Mr. Price, of Appledore, in Kent, with remarks thereon by Mr. Culley. (*An. Ag.*)

“ Sheep shearing, in Romney Marsh, commences about Midsummer, and finishes about the middle of July. Those who shear first, think they escape the effects of the fly, and those that shear late, apprehend they gain half a pound weight in every fleece, by the increased perspiration of the sheep. In early shearing, the wool has not the condition which it afterwards acquires, but the hot weather occasions a good deal of trouble in detecting the fly.

“ In order to begin, the large pen is filled with sheep ready for the coming of the shearers, in number, from four to twelve, in proportion to the extent of the flock. The time employed, two to four days. The sheep are let into a small pen thirty or forty at a time, and when taken out to be sheared, all except three, more are put in, because one or two only left would be apt to jump out. A boy keeps the gate and the account of the number sheared, with small leaden tellers.

“ These shearers by profession differ much as to quantity and method of performance; never begin early, but are satisfied with eight or ten hours shearing; a good shearer will shear ten an hour, a bad one, seven. Their emulation tends only to dispatch and profit, not excellence of performance, and the sheep are too often pulled about in a rude and barbarous manner, and even wounded by the shears, with cuts, of the length of three or four inches, and the wool left unevenly shorn: tar, or some ointment, is then applied carelessly by the boy, in order to keep off the flies. The master's office is usually to give the pitch mark, and when one field is finished, the sheep are returned, and others are in readiness to take their place.

“ The common method of CATCHING the sheep is by the hinder leg, drawing the animal backward to the adjacent shearing place ; the hand holding the leg to be kept low, when at the place it is turned on its back. Or they are moved bodily, or one hand placed on the neck, and another behind, and in that manner walked along ; the first or common mode the most safe. Sheep fed on rich pastures, and fleshy, if handled hard and bruised, the parts are liable to fatal mortifications ; an accident which often happens, on which account pens upon some lands are obliged to be lined with woollen, or many would die from bruises.

“ The PRICE of sheering 18d. a score, with a dinner, or 1d. a sheep without victual. A good WINDER will wind 400 fleeces a day, at the same price per hundred as the shearer has per score.

“ The METHOD of shearing—the left side of the sheep to the shearer’s left leg, his left foot at the root of the sheep’s tail, and his left knee at the sheep’s left shoulder. The process commences with the shears at the crown of the sheep’s head, with a straight cut along to the loins, returning to the shoulder, and making a circular shear around the off-side to the middle of the belly ; the off hinder leg next : then, the left hand holding the tail, a circular shear of the rump to the near *huck* of the sheep’s hind leg ; the two fore feet are next taken in the left hand, the sheep raised, and the shears set in at the breast, when the remaining part of the belly is sheared round to the near stifle ; lastly, the operator kneeling down on his right knee, and the sheep’s neck being laid over his left thigh, he shears along the remaining side.

Remarks by Mr. CULLEY, on the foregoing. “ Mr. Price’s observation is just, in regard to the benefit arising to wool from being late clipped, and it is consonant with the opinions of the Lincolnshire graziers

and breeders, who have paid more attention to the subject, and understand it better than any other of the profession in this island: but very great attention is required from the shepherd to keep the sheep, under the circumstance of late clipping, free from the fly and maggots, also from the danger of being *beaten* by small flies, which fasten on those parts where the points of the shears have made the smallest scratch.

“ In regard to shearing seven or ten sheep in an hour, nothing can be more absurd and improper than such attempts, since it is impossible for the best shearer to clip the lowest number within the time, and perform it well, as it ought to be done. Forty years ago, the same absurd practice prevailed in Durham, and particular men would clip 60 or 70 of that large breed in a day; but the consequence of such improvident haste was, that besides imperfect shearing, large pieces of skin were cut, particularly from the bellies of the sheep, which, being constantly pestered and tortured in those parts, by the flies throughout the summer, suffered much injury in their health and condition, some of them never recovering. Several sheep have died immediately after shearing, owing, perhaps, to having their legs tied, which, with hurrying and tossing them about, brought on a colic or cramp, putting a period to their existence in a moment. At that time, in a flock of 200 sheep, we seldom escaped without the loss of one or two in a season: since, in the clipping of 3000 and upwards, annually, we have not lost one these seven years. *But instead of tying their legs, and trying who could clip the most per hour or day, we have wisely began to try who could clip the best, and from that change of system, instead of clipping 50 sheep per day, we think it a very fair day's work to clip 25 upon an average.* Where sheep are clipped by the great, and the men paid for number

done, 30 or upwards may be sheared in the day ; but ours are done by the day, without hurry, and scarcely wounding a sheep in the day. Each shearer makes his peculiar mark on the sheep, red or blue, that bad shearing may be detected ; an useful stimulus to exertion.

“ The sheep may be caught by the hinder leg, above the hough, *but not by any means drawn backwards* ; on the contrary, as soon as the catcher has caught the sheep by the hough, he should draw it backwards, until he can, with his left hand, reach the throat, then with the right hand behind its tail, he conveys it along with ease and safety.

“ Thirty years ago, it was the general practice in this county, (Northumberland,) and some old-fashioned bigoted people adhere to it still, to shear the sheep thus—the clipper first opened the belly, and then, after tying all the four legs, sat down upon a sack filled with straw, the sheep lying between his legs ; when in the most awkward manner, he slashed and tore the fleece off, beginning at the neck, and going down the left side first, finishing at the right. Instead of clipping around the sheep, as at present, they then clipped them mostly lengthways.

“ The present method is to begin at the back part of the head, in order to give room for the shears to make their way down the right side of the neck, to the open of the breast. The man then sets down upon his right knee, laying the head of the sheep over his left knee, bent, and beginning at the breast, clips the upper side of the throat upwards, to the left cheek ; then takes off the back of the neck, and all the way down below the left shoulder. He then changes to the contrary side, and makes his way down to the open of the right flank. This done, he returns to the breast, and takes off the belly, after which it

matters not which side he clips, because being able to clip with either hand, he meets his shear points exactly at the middle of the back, all the way, until he arrive at the thighs or legs. He then places the sheep on its left side, and putting his right foot over the neck, and the other forward to the undermost hind leg, clears the right side; then turning the sheep over, finishes the whole.

“ Our price for clipping used to be one shilling per dozen, and a gill of ale about ten o’clock, and another at four in the afternoon. I suppose a man will have 1s. 6d. per dozen now; but *we clip all with our men, mostly the shepherds*, many of whom now do it most admirably: and we have in general prevailed upon them *to clip with either hand*; which is not only the easiest for the clipper, but enables him to do his work in the neatest and most complete manner.” (*Annals of Agricult.*)

All concerned in the sheep husbandry are under considerable obligation, both to Mr. Price and Mr. Culley, for their opinions on this interesting branch of their business. There is an observation of Mr. Price on good shearing, particularly entitled to our attention. He says, “ It is astonishing to see a good shearer handle a sheep; he studies its ease, and the sheep seems delighted in its situation.” I address this short sentence to certain incautious persons who employ a set of rough hewn, hard-headed boobies, to crop the fleece and disjoint the limbs of their sheep, whom I would not trust to clip a bear. I agree entirely with Mr. Culley, on the impropriety of dragging the sheep along by the leg, convinced that many are injured by that method, in particular when the fellows have had liquor. Nor should any animal be drawn by the tail, a method indeed seldom used but with pigs. Mr. Culley’s plan of instructing his own shep-

herds, and employing them in shearing, allowing them the reasonable time to perform their duty in the most perfect manner, is highly judicious and worthy of his great reputation as a rural economist. The strictest caution should be observed with respect to the sobriety of men employed in this edge-tool business.

The royal flocks of fine-woolled sheep in SPAIN are sheared in the beginning of May. There are shearing-houses, each of which will contain twenty thousand sheep; and cost in building above five thousand pounds sterling. To shear a flock of sixteen thousand sheep, requires one hundred and twenty-five men, a man shearing twelve ewes, or eight rams, in a day. The sheep are *sweated* previously to their being sheared, in a long, narrow, low *gut*, called the sweating-place, where they remain a night, crowded as close together as the shepherd can keep them. The shorn sheep are permitted to go to pasture if the weather be fine, returning home in the evening, to pass the night within shelter of the walls, or in the house, if cold or cloudy: they are so brought by degrees to endure the open air.

The practice of SALVING, or daubing the coats of sheep with some defensive composition against winter, so general in North Britain, seems formerly to have obtained in Spain, but late accounts suppose its discontinuance in that country. In North Britain the practice begins to lose ground, on the experience of those who have relinquished it, that the sheep endure the winter in a state of equal health and safety without it, and that the wool is of equal quantity, beside escaping the damage and soil of the salve. The old opinion was, and it is still retained by many, that the coat of salve not only protects the sheep from the rigour of the weather, but increases the growth of wool. However that may be, an improved winter

treatment, with less exposure of the sheep, would be an excellent substitute for salving, indeed render such a practice totally unnecessary. The most approved salve appears to consist of a mixture of one pound of tar, with four pounds of butter, which serves twelve sheep. Tallow and train-oil have been often used for cheapness sake, but the one is said to impede perspiration by matting the wool, and the other spoils its colour.

Some persons still adhere to the old practice of WASHING and ANOINTING the sheep after shearing, with the view of preventing cold, killing vermin, and promoting the growth of wool. Some use salt and water, others oil and warm water. The following form stands recommended in all the above intentions, and is by no means irrational, where the expense and trouble are disregarded; the former would amount to about three pence each sheep. Four quarts of butter-milk, two pounds melted butter, two pounds tar, and one quart of tobacco-water, in which is contained the strength of half a pound of tobacco-dust extracted by boiling; two pounds of salt; mix, and anoint the sheep all over as soon as shorn. The quantity will suffice twenty large sheep.

It has been observed, that sheep of all qualities are indifferently horned or hornless, the latter species being most numerous; the most consequential distinctions of the races are, into the LONG, SHORT, and MIDDLE-WOOLLED, or those with COARSE, OPEN-GRAINED, and FINE CLOSE-GRAINED FLESH. There are also subdivisions of FINE and COARSE both in the long and short wool, particularly in the HEATH and FOREST sheep. The fine COTTONY wool seems peculiar to a small breed in the Shetland Islands, which have been aptly enough called the Beaver sheep.

A few additions and alterations being made in the

well-known synopsis of Mr. Culley, the following will form a concise, and sufficiently particular view of the various permanent breeds of sheep upon this island.

CONCISE DESCRIPTION OF BRITISH SHEEP.

No.	White face and legs.	No horns.....	Long wool.....	Weight of Wool.	Price pr. lb of Wool.	Wethers pr. Quar.	Age killed.
N ^o . 1	Teeswater	No horns.....	White face and legs.	9lb.	1s. 0	30lb.	2 years
2	Lincoln.....	Do.....	Do.....	11	1 0	25	2
3	New Leicester.....	Do.....	Do. (fine).....	8	1 0	22	2
4	Cotswold.....	Do.....	Do. do.....	9	1 0	24	2
5	Romney Marsh.....	Do.....	Do. do.....	8	1 0	22	2
6	Dartmoor or Bampton.....	Do.....	Do.....	9	1 0	25	2
7	Exmore	Horned	Do.....	0	0 10d.	16	2
8	Heath	Do.....	Black face and legs.	3	0 8	15	$2\frac{1}{2}$
9	Hereford, Ryeland.....	No horns.....	White face and legs.	$2\frac{1}{2}$	2 9	14	$3\frac{1}{2}$
10	Morf, Shropshire.....	Horned	Black and speckled	$1\frac{1}{2}$	3 0	12	$3\frac{1}{2}$
11	Dorset.....	Do.....	White do.....	$3\frac{1}{2}$	1 6	18	$3\frac{1}{2}$
12	Wilts	Horned	Do. do.....	3	1 6	20	3
13	Berks.....	No horns.....	Black and white	7	0 10	18	$2\frac{1}{2}$
14	South Down.....	Do.....	Speckled do	$2\frac{1}{2}$	2 3	18	2
15	Norfolk.....	Horned	Black do.....	2	1 8	18	$3\frac{1}{2}$
16	Herdwick.....	No horns.....	Speckled do.....	2	0 8	10	$4\frac{1}{2}$
17	Cheviot.....	Do.....	White face and legs.	3	1 1	16	$4\frac{1}{2}$
18	Dun Faced	Do.....	Dun do.....	$1\frac{1}{2}$	3 2	7	$4\frac{1}{2}$
19	Shetland.....	Do.....	Various coloured do.	$1\frac{1}{2}$	3 2	8	$4\frac{1}{2}$
20	Spanish.....	Do.....	White.....	$3\frac{1}{2}$	6 6	14	$2\frac{1}{2}$
21	Do. Cross	Rams horned..	Do. (fine).....	$2\frac{1}{2}$	3 2	16	2

I now beg leave to submit a few practical observations to the correction of my experienced and improving readers.

The Tees-water breed I have never seen; in fact it is so nearly worn out of fashion, that I presume it would be a matter of extreme difficulty to procure any genuine individuals, were the thing desirable, which it is not on any account I am aware of, unless the property in the breed of double and even treble produce. I have heard there is a similar breed in Ireland, both derived from Batavian or Friezland stock, which came originally from India, probably from Thibet, or possessing some of that blood. Mr. Culley's description of these sheep is, that their wool is neither so long nor heavy as that of the Lincolns, but they have higher and finer boned legs, thicker, firmer, and heavier carcasses, are much wider on the back and sides, fatter, and the mutton finer grained. A genuine old Teeswater, bred at Stockton, was killed at Darlington at Christmas 1779, the four quarters of which weighed 17 stone 11lb. at 14lb. to the stone, or 31 stone 11lb. London weight, having 17lb. of tallow, after leaving all they could in the loins.

The LINCOLNS are now so generally improved by new Leicester tups, that they are, probably, in a great measure, free from those defects of the old breed, of which Mr. Culley, with much reason, complained, namely, slow feeding from a looseness of form, and too much bone, and coarse grained flesh. It must not, however, be denied, that a good old Lincoln has ever been, and the name, at least, still continues, a great favourite at Smithfield, and the flavour of the Lincoln mutton has been generally held superior, as more savoury than the Dishley. The improved Lincolns have now finer bone, with broad loins and truss carcass, and are among the best, if not actually the

best long woolled stock we have. Many will recollect the ridiculous and indecorous squabble, some years ago, between two eminent breeders, concerning these two breeds of sheep. About that time, they attempted to feed Lincoln sheep on the Essex marshes, and pretended the stock degenerated, which might happen from insufficiency of winter keep, or if they were breeding flocks, from crossing with other breeds, an everlasting and unregarded practice in those not professedly breeding counties.

NEW LEICESTER OR DISHLEY, so called from the farm, in Leicestershire, of that first of all cattle improvers, Robert Bakewell, whose name and example merit everlasting remembrance, on another account, that of humanity, and the kindest attention to brute animals, in the diligent practice of which virtue, no man ever excelled him. All his cattle were trained to such a height of gentleness and docility by patient and rational treatment, that his largest bulls would suffer themselves to be led by a child, with a twine thread; and I have heard it averred, that one of his labouring bulls was in the constant habit of dragging a cart, by himself, without a driver, to a brewhouse two miles distant, returning home with a load of grains. I formerly gave the best sketch, in my power, of the life and character of Bakewell, in a volume entitled *NECROLOGY*.

Before Bakewell's time, all the midland county sheep, as well as the Lincolns, were of a form too coarse, loose, and irregular. Having acquired much experience in the different breeds by travel in this country, and by visiting the continent and Ireland, he determined to amend the defects of the cattle in his own neighbourhood. His well known fundamental principles, that "like produces like, that small bones, thin pelts, and the barrel shape, are soonest and most

productive of fat, at the least expence of food," were most probably the original suggestions of his own understanding, for I know not, nor have been able to discover any other source whence he could derive them.

That Bakewell's theory was generally well grounded, there can be no doubt, and his improvements have received the sanction of a success so widely extended, or rather universal, that nothing similar can be found, either in past or present experience. Doubtless, the object of grazing cattle is to make them fat, and to produce that effect with as much expedition as may be, hence the immense worth of the new form, either considered as to itself, or as a cross for the improvement of inferior forms: but minds, ardent in the pursuit of improvement or profit, are apt to carry their favourite ideas to the extreme point. In that shape, which assures the excessive proneness to fat, we lose flesh, quality of meat, and length of carcase; the last a consideration of high importance in respect to weight; and it has never been a doubt with me, that sheep with a somewhat larger bone and greater length and depth of carcase, than the pure Dishley, will produce a greater weight of mutton per acre, and of a better quality, as having more flesh and less fat.

It seems preposterous to make fat the sole object in sheep, which are of a nature so prone to its production, and their flesh and juices so saturated with it, that in the last stage of feeding, the mutton is without flavour, indeed scarcely eatable: and if it be killed half fat and unripe, it is, in that state, mawkish, loose, and inferior meat. Nor is that external fat which an animal takes on so hastily, equal, in solidity or goodness, with the fat of well tallowed animals. That fat meat, were it eaten, will go farther, and is more economical food than the best lean, I will allow; but

in the comparison, the quantity of fat wasted in cookery, and sold for inferior uses, must not be forgotten.

I once dined where a leg of prize mutton made a dish. It weighed 17lb. At my desire, the fat which dripped in cooking was measured, and it amounted to between two and three quarts; besides this, the dish was a mere bog of loose, oily fat, huge deep flakes of it remained to garnish that which we called, by courtesy, lean, being itself also thoroughly interleaved and impregnated. It struck me forcibly, that an addition of a certain reasonable quantity of bone, and an exchange of seven or eight pounds of fat for lean meat, would have contributed much to the actual value and good character of the joint, but little of which was eaten at the first, and I have reason to think, not much more at the other tables.

Those large housekeepers, who garnish their tables with prize mutton, might derive some information on the above heads, from their cooks and butlers, did not weighty objections to disclosure interfere. However we have of late heard and seen the recantations of some, formerly the staunchest advocates for excessive fattening, and the same thing may happen, in due time, with respect to that peculiar form which tends so exclusively to fat.

The old common-place observation, that fat is the labourer's meat, is of that species of argument, generally pressed into the service of a favourite hypothesis; from the widest inquiries I could ever make, and in the metropolis particularly, the labourers invariably reject over fattened mutton, when they have any choice, for which there is this good reason, they must, from necessity, eat up all they buy, whereas the rich may admire, taste, and throw the remainder away; in fact, that of which we speak, is more properly rich man's

mutton. The late fashionable excess in fattening even pork and bacon, has generally disgusted the labourers; in consequence, much wanton waste has ensued, and the dealers in such articles now find unusual difficulty in their disposal.

The physical disadvantages of the barrel shape, have been long known, from experience. Its excessive tendency to obesity abates the procreative and lactiferous powers. Pure Dishley sheep are by no means the most prolific, nor the best nurses. The heads of improvers having had time to cool, it is no longer boasted that New Leicester sheep are able to subsist, and even thrive, on the shortest commons. In fine, the merits of this stock as an improving cross, (their grand point of utility) being so undeniably great, their disadvantages have been overlooked, and comparisons have been usually made with such only, as had a strong need of improvement, in which, the New Leicesters, in course, were sure to triumph. As to over fattened mutton, although it has been properly remarked, that no man can name the market in which the sheep have been rejected on that account, nevertheless the experienced buyer must, in judging of the weight, make due allowance for the defect of the short or barrel shape, and also for the weight of fat which he must strip from the outside of the carcase, in order to render the meat saleable and edible. It is true, every Dishley carcase of mutton does not furnish a loin like one weighed some years ago, which had $2\frac{1}{2}$ lb. of lean and bone, and $19\frac{1}{2}$ lb. of fat! The constant craving state of the markets for some years past, has doubtless favoured the riddance of such a commodity as we have been describing, but I am much deceived, if under an opposite state (of which, however, there is no near prospect) it would be at all possible to vend it, and if the breeder and grazier do not discover strong coun-

tervailing disadvantages, concomitant with the advantages of the barrel shape.

The characteristics of form, in the Dishley sheep, are fulness and substantial width of carcase, with a peculiar plainness and meekness of countenance; the head long, thin, and leaning backward, the nose projecting forward; the ears somewhat long, and standing backward; great fullness of the fore quarters; legs of moderate length, and the finest bone; tail small; fleece, well covering the body, of the shortest and finest of the combing wools, the length of staple six or seven inches. The fore-flank (a term of the old school, current in the time of Lisle,) or that flap of skin and fat appended to the ribs, and the inferior part of the shoulder, is remarkably capacious in this breed. New Leicester mutton, I believe, is the most finely grained of all the large and long woolled species, but of a flavour bordering on the insipid.

It is reported, and with the strongest probability, from the appearance of the stock, the fineness of the wool, and of the grain of the mutton, that a Ryeland cross was a prime instrument in the Dishley improvement of sheep. Probably the root or foundation was Lincoln. In the ordinary and gradual course of improvement, or alteration of form, it must have taken a long time and vast pains, to mould the animals into that artificial and peculiar shape which distinguishes this remarkable variety, unless indeed something nearly similar was suddenly and fortuitously chopped upon, as will occasionally happen, when the fickle deity is good humouredly disposed to spare our labours.

The Dishley cross has made its way into every part of this island; to the Land's End, to the bottoms of the Welsh mountains, and of the Scottish Highlands, to Ireland; and even to Russia. Its general success

has been attended with various particular instances of failure, a remarkable one of which is given by Lord Somerville, in his Facts, in respect to the Bampton or Western long woolled sheep. The cross is sometimes very injudiciously used with short or carding wool stock, excepting where the intention is only forward lamb. On stock naturally good and improveable, this peculiar effect of the New Leicester cross has resulted, the improved have considerably surpassed, in the most valuable properties, their improvers. Of this many examples may be seen in the improved Lincoln, Northumberland, and Midland county sheep.

All the world has heard, or read, of the high prices formerly and still given for New Leicester tups and ewes, and of the vast rates at which the former were let for the season, for that useful custom was generally introduced by Bakewell. The famous ram named the TWO POUNDER was let for one season, at the substantially famous price of EIGHT HUNDRED GUINEAS, exclusive of his duty, in the same season, to the flock of his proprietor, which being reckoned proportionally, amounts to the almost incredible sum for one year, of twelve hundred guineas. It must be observed, such high prices are given only by tup breeders. This profitable branch of husbandry has so much increased, since the days of Bakewell, that it is averred, there are now not less than ten thousand farmers, in the Midland counties, each of whom, either lets or hires a tup, for the season, at ten pounds.

The hired tups are conveyed some time in September and October, in two-wheeled carriages, which are hung on springs, and which are large enough to hold three or four rams. In these, they very conveniently travel twenty or thirty miles a day, and have sometimes been sent upwards of three hundred miles. The tupping business has been productive of much profit.

able intercourse in these counties; every considerable breeder, during the shews, keeping open house to the profession. The practice of improvement has also introduced the most liberal and judicious system of sheep management which is to be found in Britain, and their ample winter keep, and care in weaning, are examples eminently worthy of attention. The private shews of rams, in the neighbourhood of Leicester, with the public exhibition of them at that town, in October, are calculated to afford considerable amusement and information to an amateur.

Pure Dishley sheep, from their round tortoise like shape, which throws so large a proportion of their fat upon the external parts, cannot be expected to tallow well internally. From their natural propension to early, and in some degree morbid obesity, they are liable to early decay, and generally grow old sooner than other breeds. From the excellent management of this stock, in the Midland counties, a ram has often effectually served seven score ewes in one season. The Dishley sheep have been sometimes called tender, and the cross has been said to impart debility. I have not found it so. On inspecting the last prize sheep of this breed, my first idea was on the facility with which a certain form is converted into a living grease tub.

Specimens of the pure original breed of Midland long woolled polled sheep yet remain in Leicester, Northampton, and Warwickshire, they are, in course, larger boned, longer shaped, deeper woolled, and coarser stock, than the improved species. For the most part, however, the sheep of those counties have a mixture, more or less, of Dishley blood.

The ewes of the old breeds, from the coarseness of the head and neck, are found to lamb with more difficulty, and to require more frequent manual assist-

ance from the shepherd, than the improved, which are finer in those parts.

The GLOUCESTER, or COTSWOLD sheep, are of the fine combing wool species, deriving the fineness of their fleece from the same source as the New Leicesters. This part of Gloucestershire, as was remarked, page 262, formerly, and within memory, bred small fine woolled sheep of the Ryeland species, which in past times had been cotted, but the practice was discontinued. These sheep, being judged too small for the improving state of the country, have been, by gradual crossings with Midland long woolled rams, chiefly Warwicks, completely changed from short, to large, long woolled stock. I saw a picked lot of Cotswolds, last year, which answered the following description: long coarse head, with a particular blunt, wide nose. A top-knot of wool on the forehead, running under the ears. Rather long neck. Great length and breadth of back and loin, full thigh, with more substance in the hinder than fore quarters. Bone somewhat fine, legs not long, fleece soft, like that of the Dishley, but in closeness and darker colour, bearing more resemblance to short or carding wool. Although very fat, they had all the appearance of sheep that were full of solid flesh, which would come heavy to the scale. It is said, some of those sheep have reached 40, and even 50lb. a quarter, at two years and half old, giving 11 to 14lb. of wool each sheep, which being fat, they are, indubitably, among the largest breeds in England. A single dip of New Leicester gives the Cotswolds a fullness in the fore quarters, but any farther cross of that species, it appears, diminishes their size. The strange cross of Wilts horned sheep has been recurred to in some parts, for no possible good purpose, I should apprehend, either to the carcase or wool, and it is probable,

supposing such large stock profitable, that the chief alteration required by the Cotswolds, is to encourage length of staple, in their fleece.

ROMNEY MARSH, KENT. This also is a large, polled, long woolled breed, but of a size somewhat more moderate than several of those already described, although individuals of them have sometimes arrived at great weight, both of carcase and wool, which last, among the prime flocks, is of fine quality. Kent rams have clipped twelve pounds each. The breed, it is said by well informed persons, was superior in the carcase, forty or fifty years ago, to what it is at present. I have not much observed the Romney Marsh sheep, but they appear to me to want symmetry, or regularity of form, which, whatever the size, would enable them to carry a greater proportional burden of flesh. The stock is good in its kind, and a considerable improvement might be wrought in them, without the aid of any alien cross, but not independently of the aid of much labour and attention throughout many seasons; a divertisement, which probably may not be held so interesting, as that usually experienced with a pipe, and a glass of punch or old bottle port. Part of the Kents go to Smithfield two shear, and very good sheep; the remainder are kept until three years old, and are considerably heavier.

Romney Marsh has ever been famous for its vast annual return of mutton and wool, and for the number of sheep per acre it constantly feeds. It is divided into breeding and feeding grounds, according to quality. The graziers have an excellent practice of providing a sufficient number of Welsh calves, and keeping them at a straw yard, in readiness to turn into the marshes in season, with the intent of keeping under the long grass, and of preventing its running away from the sheep. The marsh supposed to produce

20lb. of wool per acre, or to make, perhaps, an annual total of five thousand packs, some of it of the finest quality, and longest staple, but often disadvantageously mixed with an inferior quality, which induces a hesitation in the buyer, and an uncertainty as to the price. The winter management of the sheep, I am sorry to observe, stands far more in need of improvements than the breed itself. The ewes are much injured by exposure, and in a difficult season, are very weak at yeaning time, seldom bringing up more than a lamb, although many twins are yeaned; great sickness and mortality often ensue, causing an immense waste of mutton and wool, with no trifling reduction of condition and quality in the stock.

The very few of the BAMPTON, or Devonshire long woolled sheep, which have come under my observation, appeared to be a deep, strong, short legged variety of the common hornless species, liable to no very strong objection. The EXMORE is a coarse middle woolled heath sheep. They are horned, with white faces, and blood, or deer-like neck and head, with deepish, flat sides; from these, and the circumstance of their lambs being sometimes dropped hornless, indicating a cross of that species, I conjecture their origin to be from Mendip ewes crossed with Bampton rams, although I must own this is mere conjecture. However in their present state, they are by no means to be reckoned among profitable stock, either in respect of carcase or wool, on which account it would obviously tend to the interest of the country to exchange them for the best fine woolled species.

HEATH SHEEP. Having never yet visited the native district of these sheep, I take the account of them from Mr. Culley. Large spiral horns, black faces and legs, a fierce wild looking eye, short, firm carcasses, 12 to 16lb. per quarter, covered with large, open,

coarse shagged wool, fleeces 3 or 4lb. each, wool worth at present about 8d. per lb. Wild as they look, active, hardy, running with amazing agility, and best adapted, of all other breeds, to exposed, heathy, and mountainous districts. Seldom fed until four or five years old, when they feed well, and make the finest mutton, with high flavoured gravy.

This breed are natives of the north-west of Yorkshire, and of that mountainous tract of country adjoining the Irish sea, from Lancashire to Fort William: they have been of late years introduced into the western Highlands of Scotland, and the black faced Linton, or SHORT SHEEP of Scotland, appear to be a variety of the Heath sheep. They have been crossed with the Cheviot breed, and Mr. Culley recommends a Dishley cross, meaning, doubtless, for the use of the low lands. If I may be allowed to give an opinion, I would, for upland situations, recommend a Spanish cross, with good winter management, in preference to all others. It is disgraceful to the rural economy of Britain, that so excellent a breed of sheep should be needlessly compelled to brave the rigour of the seasons, in such loose, ragged, and beggarly clothing, when they might, with a few years pains, and without any deterioration of the carcasses, produce a fleece of high value and consequence to the manufacture of the country. Mr. Henry King, the salesman of Newgate Market, and an eminent grazier, informs me that he once fed a lot of these northern Heath sheep, and made excellent mutton of them, about 16lb. a quarter; but that their wool, hanging down their quarters like goat's hair, was so execrably bad, that it could be sold only for mop yarn. Mr. King remarked the peculiar wildness of their eyes.

THE HEREFORD, ROSS, OR RYELAND SHEEP. These, whilst they remained pure and unmixed, bore the

finest fleece of any British sheep, and the nearest in appearance and quality to the Spanish wool. Their mutton had always an equal character for excellence, but no great quantity of it, in these times, finds its way to the London markets. They have been of late years much crossed with Dishley tups for the reasons before assigned, and it is averred, a fact for which I cannot answer, that they are now become far more tender, and worse in constitution than formerly, when they used to be esteemed a very hardy race. On those farms where they still *cot* their sheep, they are either kept in the cot by night, all the year round, or in the winter months only, their food being pease, barley, oat or wheat straw, in racks. The cots will lodge from one, to five hundred sheep, each.

SHROPSHIRE OR MORF SHEEP have small horns, with speckled, dark, or black faces and legs; they have the full character of real fine woolled sheep, and have been, for centuries, bred in Shropshire, Staffordshire, Worcestershire, and the vicinity. Their fleece is nearly all fine, and it is said, superior to Ryeland wool, since the crossing which has taken place in that stock. Mr. Pitt, of Pendeford, in a letter to Lord Somerville, dated 1799, estimates the extent of Morf common, or waste, at 3,600 acres, and the number of sheep summered thereon, at 15,800, to the annual profit of fifteen shillings per acre in wool only, on a moderate calculation, eight fleeces and half to the stone of fourteen lbs. Nothing is reckoned on account of carcase, as the sheep have some extra keep during winter. The Shropshire commons produce good fine wool, but none equal to Morf by sixpence a pound.

DORSET sheep, such as come nearest to the original model, for this excellent stock has also been frequently tampered with, and crossed, may be thus described—

face, nose and legs white, head rather long, but broad, and the forehead woolly like the Spaniards and Ryelands, the horn round and bold, middle sized, and standing from the head, the shoulders broad at top, but lower than the hinder quarters, the back tolerably straight, carcase deep, and loins broad; legs not long, nor very fine in the bone. The Dorsetshire breeders, it is said, pay great attention to preserve the colour of their flocks from mixture, since white lambs are most esteemed in the London markets, from a presumed superior delicacy in the meat. I believe this is one of the best breeds in England, if not superior to all others, considering its various qualifications. Their property of bringing twins, making our highest prized house lamb, must be considered first; they are both good hill sheep and good pasture sheep, and their flesh is an excellent medium between the delicate mutton of the hills, and the rich and juicy meat of the best lowland sheep. The latter Dorset lambs when fattened, make the earliest grass lamb. By the practice of this county, the lambs which the breeders retain, are shorn at Midsummer, having been taken from the ewes in May; produce of wool, one pound to a pound and half each, the price a penny per lb. nearly, under the price of sheep's wool. A three shear sheep may produce four or five lbs. of middling fine wool, which it would be highly advantageous to improve to the utmost, on this excellent breed.

SUSSEX OR SOUTH DOWN SHEEP, another variety of short woolled stock, second to none in Britain, for high reputation and indeed for real use. They are one of the old varieties, and have been immemorially in possession of the Sussex downs, and of the Surrey and Kentish hills. Of late years, their great merits, both as hill and pasture sheep, having become more generally known, they have been propagated and

naturalized in almost every part of this island, and in Ireland. Those great and leading names in rural patriotism, the late and present Duke of Bedford, and T. W. Coke, Esq. of Holkham, through the medium of their annual shearing meetings, have chiefly contributed to develop the excellencies of this breed, which, perhaps, if we look to the superior number of tups engaged, may be considered at this day, as the most fashionable.

Within the last twenty years, the South Down sheep have been variously crossed with other breeds; whether improved or not, by such means, depends simply on the solution of an intricate question, often introduced in these pages, but never settled, from the acknowledged inability of the author. The most noted variety is that of Mr. Ellman, of Glynd, in Sussex, who, I believe, first enlarged the Down breed, by the aid of polled, or *natt* Berkshire tups. From this enlarged cross I understand, originated the stocks of the Duke of Bedford and Mr. Coke; the South Downs of Mr. Coke being generally acknowledged the largest and finest in England, a very pregnant proof of which we had at Lord Somerville's cattle shew, in a two shear Holkham South Down wedder, which weighed more than 40lb. per quarter. Although quick and early feeders, they tallow within remarkably, and it has been supposed, whimsically or otherwise, that their strong digestive faculty so completely exhausts their aliment, that the residuum or dung is, in consequence, very inferior manure in the fold. More than one third will produce twins, if the ewes be well winter fed, and the lambs are very well covered when dropped. They are quiet, healthy, and very handsome park stock.

The common *deceptio visus* of the mind's eye has taken place with regard to this breed. We hear our

sage, elderly speculators, who knew the old Down sheep, lament, with serious concern, that their wool is become so much coarser than formerly, from the modern habit of feeding the sheep with rape, cabbage, and oil-cake. These gentlemen seem totally to forget the middle and long woolled cross, by which the carcase of the South Downs of the present day, has been enlarged, and their weight of wool increased, and rendered more coarse. The mutton is still excellent, although probably not so high flavoured as the old Down mutton, which both history and tradition informs us, was honoured with approbation by the travelled and discriminating palate of Charles II. of mutton-eating memory:—

“ ——— had heard Sir Robert Sutton

“ Say how the King lov'd Banstead mutton.”

Some sheep farmers prefer the old, uncrossed breed, of which I have heard Lord Pelham's flock consists. These have the usual form of fine woolled Down sheep, approaching the Spanish—small head, ewe-necks, low before, and light in the shoulders, good sides, back a little ridged, middling wide loin, full quarter and twist. Being low before, certainly contributes to make them close feeders, and to adapt them to a hill country, and the hinder quarters, in which their weight lies, are more valuable in real quality, as well as price, than the fore quarters. The improved variety is much enlarged forward, and carries a good fore-flank. It is difficult to point out any part of Britain for which this breed would be unfit, but extremely easy to name a vast number of districts, where it would be a most advantageous substitute for the native stock. All the South Downs want is the noble covering of a Spanish fleece, and how little their carcase would suffer by the cross, has

been demonstrated by Lord Somerville, in the exhibition of a very fine ewe, large enough for any purpose, half Spanish, and half South Down.

WILTSHIRE OR HORNED CROCKS. Large head and eyes, Roman nose, wide nostrils, horns bending down the cheeks, colour all white, wide bosom, deep greyhound breast, back rather straight, carcase substantial, legs long, bone coarse, fine middle wool, very thin on the belly, which is sometimes bare. The basis of this breed is doubtless the Dorset, enlarged by some long woolled cross, but how the horns come to take a direction so contrary, is not easy to conjecture, I have sometimes imagined it must be the result of some foreign, probably Tartarian cross. The old Hertfords were supposed a kindred breed with the Wilts, but at present, the few of this kind bred in Herts, are of smaller size, longer and coarser wool. These large and leggy Wilts sheep work well in the fold, and have always had the character of good thrivers at corn, oil-cake, and the best meat, making very large mutton, and very deep in flesh, which is high flavoured, yielding the dark coloured gravy. The breed is yet every where on the decline, generally supplanted by the South Downs, of which the farmers find they can, on the same quantity of land, keep more than one and a half, for one of the Wilts, the former moreover, producing both better mutton and better wool. The disease called the GOGGLES, said to be peculiar to the Wilts sheep, will be adverted to in its place. This breed has been used, more or less, in the counties bordering on Wilts, and in Surry, Kent, Herts, Essex, and Middlesex: I have been accustomed to see them all my life, but from the best comparative estimate I am able to make, I think the breed not worth preserving; perhaps the only thing to be done with it to advantage, is to cross it with Merino. I last year

saw a tup large enough to make more than twenty stone of mutton, which was by a Spanish ram out of a Wilts ewe.

The HAMPSHIRE, a variety of the former, said, for what reason I know not, to be more hardy. BERKSHIRE NATTS. I have not paid much attention to this breed, but I lately saw two tups from Berkshire of the following description; considerable length and bone, straight made like horses, full fore flank, Roman faced, with distinct black spots, high on the leg, thick fleece, of considerable length. They class, I suppose, with the middle-woolled breeds, and probably bear some affinity to the breed of Oxfordshire, which is, I am told, a peculiar variety.

NORFOLK. These are a fine woolled heath sheep, natives, I suppose, of that county when it was a barren waste, and, a singular and uncommon instance, retained throughout such a number of years of improvement and cultivation, under which circumstance, improved sheep are generally held necessary. However, the error, granting it to be one, is about to submit to a gradual remedy, in the substitution of South Down stock, an improvement, I believe, for which the county is indebted to the example of Mr. Coke.

Norfolk sheep have black faces, black, or dark grey legs, large horns, of such size indeed, that some of their rams horns, if straight, would each measure a yard in length, and near a foot in compass at the base; narrow chins and backs, long and thin, but straight barrels, long legs, with much bone. A part of the light fleece of this breed is coarse, the best of it very fine. The flesh excellent, but it does not stiffen well in hot weather, and, for which no reason can be assigned, taints sooner than any other high flavoured mutton. These sheep are almost as wild as their

cousin germans the northern heath sheep, and previously to their introduction into a strange country, fences had need be purposely erected. This, however, is a waste paper remark; few strange districts, I believe, are disposed to adopt Norfolk sheep. They fatten to sufficient size, but it is probable, cost full as much to bring them to that state, as certain other breeds, which would, in less time, make several stone per carcase more weight. Their chief character is as folding sheep, and in the ultimate perhaps, the common folding system is to purchase crown pieces at six shillings each. They have been crossed with South Down tups, which produces a variety with small thin horns, and long thin carcasses; the London salesmen do not approve them. The Spanish cross upon them would doubtless produce a valuable fleece, and not improbably, shorten, and give them an aptitude to make fat.

IN SUFFOLK and CAMBRIDGESHIRE, Norfolks, or a variety of them, are bred: in the latter county, in fact, an *omnium gatherum* district, as to live stock, they have contrived to hash up a variety of home breeds, between the Norfolk, Hertfordshire horned sheep, and I apprehend the Lincoln. This medley makes about 18lb. per quarter in carcase, bearing coarse hairy wool of low price.

THE HERDWICK SHEEP OF CUMBERLAND, so called from their having been immemorially farmed in herds, at a yearly sum, upon certain mountain farms, thence called Herdwicks. The property of the flocks, as well as of the mountains, is in the lord of the soil, Lord Muncaster. The present farmer of the principal flock is Mr. Tyson, whose family, it is said, have inhabited this wild and sequestered spot through four centuries. Mr. Tyson is a tup breeder, and sells a number of Herdwick tups yearly, some at several guineas each,

to the adjoining districts, where their known hardy qualities are desirable.

Two kinds are described as common to this country, namely, a short woolled, and the coarse woolled heath breed. I have been informed, the Herdwicks consist of the latter, but Mr. Culley, whose account I shall follow, says the former; having no horns, faces and legs speckled, but a greater portion of white, with a few black spots, accounted marks of the purest blood; fine small clean legs, a thick matted fleece of short coarse wool, the lambs when dropped well covered. They are a very lively little animal, well adapted to rocky and thin soiled countries, and support themselves in winter, without hay, in the severest storms and deepest snows, by scratching down to the heath or other herbage, instinctively finding out those parts of the mountain which are blown bare. They do not face the storm as has been said, but like other sheep, turn their backs on it; and in such weather, generally gather close together, and keep stirring about, by which means they are seldom overblown, as they tread down the snow and keep above it. Loss per cent. per annum, of hogs, from 5 to 10—old sheep, from 2 to 5. Ewes often kept from ten to fifteen years of age, or as long as they will breed. Wethers go off at four years and half, and both sold to the butcher off the mountains, without the aid of any better keep.

Considering the winter exposure of this interesting and useful little race of animals, the annual loss per hundred, above stated, is indeed small, but that is far from being the whole consideration; the grand point is how much time, substance, wool, and improvement, is lost by the plan of annual starvation. The size, form, and matted fleece, with the ample covering of the new fallen lambs, in the Herdwicks, puts one in

mind of Spanish stock, and seems to point out the thing needful to be done. A Spanish cross here, would even raise the size, and with little doubt, would render the Herdwicks one of the most valuable breeds in Britain. Whether such an improvement has been ever attempted, I am uninformed, but the idea is submitted to the serious consideration of Lord Muncaster, a noble lord, I have reason to believe, zealously attached to the agricultural and commercial interests of his country. It is a wretched thing to grow short wool for six or eight pence in a sheep country, where a commodity might be produced worth two or three shillings per lb. The wool of these hills has, according to my information, been generally undersold, for want of a market; but was there in the district, any quantity of really fine clothing wool to be annually disposed of, it is impossible to conceive that so precious a commodity could, in the present state of things, fail to attract both the attention, and a share of the ample capital of our manufacturers. Lord Muncaster has, some years since, introduced a breed of long woolled sheep, with various agricultural improvements.

In WESTMORLAND, it seems, the sheep are “sik as God set upon the land, so they never change any:” they are, however, built nearly right wrong, according to the following description of them by Mr. Culley—“Back narrow, carcass long and thin, supported upon large rough legs, with coarse hairy wool hanging down from their throats, all the way to their breast, which gives them more the appearance of goats, than of sheep.” Now since far better sheep would require no more food than the above, one would suppose a change worth the trouble, and granting an inferior market for the wool, in the outset, some degree of advance must necessarily follow improved quality; time will do all the rest.

By accounts of some years past, Skiddaw forest took sheep at three pence a head, by the year, only six pence per acre; and even excellent and less elevated land, that would grow good corn, and feed the best stock, paid no more than a shilling or two per acre, in a county which does not grow corn enough for its own consumption, but always paid one fourth, to one third, higher price than other counties. Here a wether at four years and a half old fetched five crowns, and many flocks were kept for the wool only. I speak in the past tense, in the hope that an improvement has taken place.

Yet a late traveller writes, that in the mountains of Cumberland and Westmorland, their sheep, from winter exposure, are liable to perpetual accidents, and that there are instances of the loss of twelve or fifteen hundred head in a year, which casualties prevent their farmers from becoming rich. It is averred also, that the sheep of those wild regions are subject to be bewitched; an error of the press, or of some other kind, in my opinion; the sheep owners only are bewitched.

The Cheviot sheep are hornless, faces and legs white, excepting when crossed with the Heath breed, which gives them speckled legs and faces, and sometimes small grizly horns; the pure breed have a fine open countenance, with lively prominent eyes, long body, largest in the hinder, the fore quarters being narrow and low, fine small boned legs, wool worth about 14*d.* per lb. one third of it coarse at 7*d.* This is one of the best breeds of English sheep, but it is a great disgrace to our northern cultivators, so enlightened on various rural topics, that such superior sheep should wear a fleece of a quality so inferior. The proper cross for this excellent breed is the Merino, or if an English one be preferred, the South Down, past all question. As to the excellence of Cheviot mutton, I

am enabled to speak, having known, in the course of years, two lots slaughtered in the South; the grazier of the last, however, complained, that on account of their age, four shear, they had no *growth*, and that in consequence, he profited nothing but the fat he put upon them, which he observed did not pay him proportionally with his other stock.

This breed we are informed has succeeded equally well in the Highlands of Scotland, as upon their native hills, in all probability, paying double the rent of the black faced, or short sheep. There was, some years since, a flock of four thousand Cheviots in Caithness, which the proprietor proposed to increase to ten thousand.

Mr. Culley proposes to improve this breed, as well as the South Downs, by enlarging their fore quarters, on which opinion, with all possible respect, I must beg leave to demur. Nor can I altogether satisfy my mind on the first limb of the following position which he has laid down. “*It is not the value per lb. which constitutes the farmer’s profit, but the value per fleece; or rather that breed is the best that brings the most profit in fleece and carcase jointly, from the same ground, in equal time.*” Certainly in two fleeces of equal weight, the wool which is worth most per lb. must carry the most profit, and speaking of fine wools, quality ever carries it. Again, suppose two breeds produce an equal quantity of mutton per acre, surely that which is on an average marketably worth most by one farthing per lb. must be the most profitable. On the second member of the proportion, I can easily agree, with the addition, that although carcase must ever be of paramount consideration, it appears to me, there is no incompatibility in the joint and equal improvement of both wool and carcase. Mr. Culley agrees that a fine woolled breed is the most proper for

a mountain farmer's stock, and that the Cheviot sheep are well calculated for laying the foundation of so desirable an improvement. I seize the opportunity to remind the country of the opinion of a judge of so consummate experience as Mr. Culley, not doubting but it will have due weight.

The management of the Cheviot sheep farmers, excellent in some respects, seems liable to objection in others. They divide their flocks into different parcels—*lambs, hogs, gimmers, ewes, and wethers*; keeping each parcel on such pasturage, as is thought to be most proper. Each lot is attended by a shepherd, who is bound to return the number of sheep delivered to him, either alive, or in an account of dead sheep, which are, in general, sold at different prices, according to their goodness. This mutton, I am informed by a Northumbrian friend, is eaten by the poor, and, which I hope is unfounded, by the farm servants. The ewes are not suffered to breed until three years old, surely not the mode of deriving the greatest profit from sheep, which must rather be from allowing them ample sustenance in the winter, according to the midland county system, and suffering them to breed in their second year. The profit of milking ewes for eight or ten weeks, Mr. Culley observes, is estimated at eight pence per ewe, and the damage done to the ewe, eighteen pence at least, all which need be said on this antiquated practice.

The DUN-FACED SHEEP of the Grampian hills, are hornless, faces of a dun or tawny colour, wool variously mixed and streaked, black, brown, red, and dun, some of it very fine, tails short, size of the sheep, the smallest upon the island, many of them weighing only six or seven pounds per quarter, the mutton excellent.

Mr. Culley supposes, with much probability, that these sheep are of Spanish origin, and that they might

have been cast on shore from the wrecks of the Spanish armada. The same kind of sheep are found in Spain, and are called *Ovejas Marinas*, and their wool, of which the fine Segovian cloths are made, is reckoned the finest in the world, excepting the Peruvian and Cashemerian. These coloured sheep, we have already seen, were bred and much valued in the time of Columella. Mr. Culley inclines to the opinion that this breed is too tender for the severe climate of the Grampian hills, and that they will soon be supplanted by the Heath or Cheviot sheep; yet the dun faced have been there naturalized for centuries, and no instances of their defect of hardiness are quoted; moreover the Shetlanders, the same breed, are perfectly hardy.

The SHETLAND breed seems nearly the same with the above; indeed there can be no doubt that they are kindred varieties—hornless, unusual short and small tails, wool very fine, and of various colours, weight of carcase seven to ten lbs. per quarter. A variety of these carry coarse wool above, and fine soft wool below; and have three different successions of wool yearly, two of which resemble long hairs more than wool, and are termed by the common people, *fors* and *scudda*. When the wool begins to loosen at the roots, which generally happens about the month of February, the hairs, or *scudda*, spring up; and when the wool is carefully pulled off, the tough hairs continue fast until the new wool grows up, about a quarter of an inch in length, then they gradually wear off; and when the new fleece has acquired about two months growth, the rough hairs, termed *fors*, spring up and keep root until the proper season for pulling it arrives, when it is plucked off along with the wool, and is separated from it at dressing the fleece, by an operation called *forsing*. The *scudda* remains upon the skin, as

if it were a thick coat, a fence against the inclemency of the seasons. (Mr. Johnson's *Report*.)

The native or KINDLY BREED, which bear the soft cottony fleeces, Mr. Culley says, are rather of a delicate nature, yet in the next page, he describes them as very hardy, and the wildest of all others: this apparent contradiction might probably be reconciled, like many others of the same nature, could we actually view the animals instead of only reading of them. The following facts assure them an abundant degree of constitutional hardiness. Whilst the ground is covered with snow, they eat sea weed very greedily, and often, during long and severe snows, they have little else to live on. Nature, says Mr. Culley, seems to have imparted to them a perfect knowledge of the times at which this food may be procured; for immediately upon the tide beginning to fall, the sheep in one body, run directly down to the sea shores, although feeding on hills several miles distant from the sea, where they remain until the tide returns, and obliges them to seek their usual haunts.

The wool of these BEAVER sheep is short and open, and destitute of a covering of long hairs. These soft fleeces are liable to be rubbed off during winter, or early spring, which, it is said, might be prevented, by clipping the sheep in the usual way, instead of the barbarous mode of pulling off the wool, which tends to weaken the sheep, and decrease the length of the staple. I had always understood that *pulling* the wool was unattended with pain or damage to the animal, but the case being otherwise, so improper a practice ought not to be suffered to continue by the lords of the soil.

The colours of Shetland wool are various: SILVER GREY the finest and softest; the pure WHITE generally the most valuable for all the purposes of the finest

combing wool; the BLACK and the MOURAT or BROWN, very little inferior. All of the softest texture, fit for the finest manufactures, and in some instances rivalling even Spanish wool, than which it is somewhat longer in the staple, and not so elastic. According to an account in the Bath Society's Papers, stockings have been made of this wool, at Aberdeen, which were sold for five or six guineas a pair: and such is its softness and lustre, that the skin with the fleece on, makes a fur of great value, specimens of which have been sent to the China market.

The Shetland breed were formerly native of the higher parts of Aberdeenshire, and every where to the northward of that county, but they have been since crossed, most probably, with the common view of increasing size with the improvement of the soil, and are now confined to the Orkney and Shetland isles, the purest breed being to be found in the latter, where also are fed both long and short woolled sheep of the English and Welsh breeds. The number of the Beaver sheep in the isles were said to amount to ninety thousand, some years since, and that five or six of them might be fed with the food required by one English sheep. At Mr. Beaumont's, in the West Riding of Yorkshire, these sheep were formerly tried, the result was, that they did not fat, but grow, a sure sign that their size would improve with the soil; their wool also improved in length, but we are not told that it became coarser.

The ancient original breed of the Scottish Highlands are thus described:—different in character from southern sheep, and partaking of that of the goat and deer. Their fur, rather than wool, consisting of a sort of down covered by long, straight, rigid hairs, like those of the beaver; tail short, slender, tapering, not larger than that of the deer or goat, and thinly covered with

strong, silvery hairs; face covered with sleek hairs like the face of the deer, with his prominent eyes. Tame, delicate of frame, and requiring to be housed in winter: their flesh of high venison flavour. It is said that the wools and furs of Asia, which are imported at such a high price, for the use of hatters, are of the same nature with the fleece or fur of this breed of sheep, to be still found, in its original purity, in the Central Highlands, on the southern banks of *Strath Tay*, and between those and *Strath Brand*, and on the banks of *Loch Ness*, on the northern Highlands, as well as in Scotland, Denmark, and the Shetland isles.

The present popular division of the Scottish sheep, is into the LONG HILL SHEEP, and the SHORT SHEEP. The former, a hornless, white, loose shaped breed, bearing a fleece of ordinary short, or fine wool, I apprehend to be a permanent variety raised by crossing, through a long course of time, the old original breed of the country, with Cheviot rams. This breed, although more productive with good care and keep, is more tender than the black faced breed. It is said these last also were formerly short woolled, and that the present length of staple in their wool, has resulted from crossing. It seems doubtful, whether they were indigenous in Scotland, or derived from the Yorkshire moorlanders, as has been said.

Thus the hills and short pastures of Scotland are stocked with long, short, and Cheviot sheep, whilst their rich vales are grazed with English long woolled stock, chiefly Northumbrian with the Dishley cross. This latter variety prevails throughout Northumberland itself, and great part of Yorkshire; in the former county, from the original example of the house of Culley, most respectable and flourishing both for wealth and talents, the tuppings business is carried on

to great extent, and rams are let at an hundred guineas the season.

In Yorkshire are several varieties of long woolled sheep, under their respective district appellations, but I am not aware of any of them meriting a particular comment, and doubtless they will all give way, in course of time, to the improved. This county, and that of Lincoln, are distinguished beyond all others for the coarse and heavy fleece of their sheep, the reason of which is, they have immemorially bred for long wool, and the old unimproved varieties bear, individually, the greatest weight. The comparative quantum of wool per acre, between the unimproved and the improved, is another question. Mr. Thornbury, of Thornton Stewart, already mentioned, informed me last year, that the average weight of his fleeces amounted to nine pounds each; the wool, at some advance, worth at this time one shilling per lb. I quote this farmer with pleasure, as a man thoroughly skilled in the labouring and practical parts of cultivation, yet endowed with an inquisitive mind, and entirely free from those common prejudices which shut up every avenue to improvement. Such men are well worthy of every possible encouragement from their landlords.

In the West Riding of this county, and in the adjoining parts of Westmoreland, we find a breed of horned and white faced sheep, bearing a strong affinity to the Dorsets, they are called Craven and Wensleydale sheep, but more generally, Peniston, from the market town where they are sold. They are a good down, or hill sheep, in their pure state, and give a fleece of coarse short wool, weighing between two and three pounds, the carcase good mutton, about fifteen pounds per quarter. They are variously crossed in the West Riding, with Cheviot, Dishly, and Nor-

thumberland tups, with the two last, for the purpose of making pasture sheep, in which case, weight of carcase is increased to twenty or thirty pounds per quarter. In the north this breed is commonly crossed with the Heath sheep, which gives them black or grey faces and legs, with sometimes a black spot on the top of the neck; the wool coarse and open, instead of being close and thick set upon the skin, as a defence against the severity of the climate of that hilly and exposed country in which they are fed: defects for which the remedy is obvious. Ryeland tups have been tried with the Peniston ewes, a cross which made a considerable improvement.

But the strangest cross of which I had ever any account was between a Teeswater ram and a small Welsh ewe, (not indeed in the county of which we are speaking) the ewe received no harm in lambing, which might have been expected, in consequence of the disproportionate size of the ram, and the produce, weighing 19 stone, was sold in the London market. A Durham or Teeswater sheep sent, some years since dead, to the same market, weighed 16 stone 5 lbs. each side, being one stone heavier than the large Teeswater quoted by Mr. Culley. A lot of the same breed were also fed on the marshes near London, which did their business well, and in good time, making, on the average, 22 stone of mutton. Their wool was harsh and coarse. By these and various other facts, the superiority of this northern breed, in point of size, is fully attested.

In Staffordshire, they have species of sheep in greater variety, I think, than elsewhere. The original polled, long woolled sheep, with the Dishley cross. The Cannock heath down sheep. The Morf sheep already described. A mixed breed upon the commons, the wool complained of as *too coarse for clothing, and too*

short for combing ; a defect by no means confined to the commons in question. A mixed pasture breed.

As is too invariably the case, improvement is chiefly confined to the long woolled species, and the tups of Mr. Prinsep and Mr. Harvey, steward to Lord Bagot, have taken the lead. The native Stafford breed, however, of Sutton Coldfield, and its vicinity, commonly called **CANNOCK HEATH** sheep, are probably among the best of our English down sheep, indeed apparently a similar species with the Sussex South Downs. Polled, with grey faces and legs, and low before ; when the faces incline to black, I suppose a cross with the Morf breed is indicated. Wool fine, and thickly set, weight of fleece two to three lbs. : the mutton said to be equal to any ; carcase of the wethers from 15 to 20lb. a quarter. Sir Edward Littleton, a gentleman who ranks high in this science, formerly crossed the Cannock Heath sheep with Hereford rams, which cross produced a good carcase, and amended the wool, advancing its price, at that period, from about thirteen pence, to nearly two shillings per lb. The sheep feed of the commons in this county, said to be diminished by rabbits, generally a wasteful nuisance wherever they are suffered at large. The Cotswold, Wiltshire, and Dorset have also been tried in Staffordshire ; the latter, as I think they must every where, gained a high reputation for proof.

The original, at least the most prevalent breed of **WELSH** hill sheep, are small, horned, all over white, and of a neat and peculiar appearance. They have also hornless, short woolled sheep, in Wales, and it is pretended, on what authority I know not, that our famous Ryelands are of Cambrian origin. The mountains of Radnor and Montgomery, I am informed, produce the finest wool. I have not heard of any peculiar variety of pasture sheep in Wales ; as in

Scotland, they adopt the English long woolled breeds for that purpose.

The practice of milking sheep in Wales, seems not to be so thoroughly abolished, as in Scotland, a country far more advanced in agricultural improvement. The Welsh esteem highly the cheese made of sheep's milk, one pint of which, they aver, to be equal in richness, to four of that of the cow. A sheep said to give a quart of milk per day, when she will give it freely; when otherwise, the milkers use the disgusting practice of striking the distended dug with all their force. The sheep are milked three months, and the return stated at ten shillings an ewe. One milker will serve twenty ewes a day, a duty generally performed by the labourer's wives, whose pay consists of the Saturdays and Sundays milk.

Welsh mountain mutton bears a high character and price in the markets of the metropolis, but much old crock rubbish from various starving districts, is sold under that denomination. The attempts to feed small Welsh sheep in Middlesex, and the bordering counties, have not been generally successful; indeed it ought now to be expected, that the great landed proprietors of the Principality will, without farther delay, set heartily about the improvement of their sheep; there cannot be a country better calculated for the growth of fine wool, and the old objection of a deterioration of the carcase, I may presume, will not attach, in any one's opinion, when applied to Welsh sheep. I have occasionally heard heavy complaints of the drovers rotting Welsh sheep, on their journey, by suffering them to rest by night upon wet commons. It seems to be agreed, that in Scotland and Wales, sheep do not produce twins so frequently as in England.

On a retrospect, I find I have strangely overlooked one of our original and best breeds of sheep, the

natives of the MENDIP HILLS. They are said to be a variety of the Dorsets; I should rather have supposed the former to be the elder branch of the family, and the Dorsets to be a Mendip variety. They are somewhat smaller than the Dorset, the horns smaller, and the head of a more wild and deer-like aspect; wool also somewhat less in quantity; the mutton of high venison flavour.

Of the IRISH sheep, I can say nothing from my own knowledge, since I am not conscious of even ever having seen one; but it may not be unuseful to borrow again from Mr. Culley, who visited Ireland, and it is a compliment justly due to the patriotic and spirited improvers of that country, to place before the reader's view, what kind of originals they had improved, and the task they had the patience to undertake.

Mr. Culley saw, at the great fair of Ballinasloe, a shew of 95,000 sheep, and was informed by the collector of the tolls, that there had been often more shewn. Take Mr. Culley's description:—"These sheep are supported by very long, thick, crooked, grey legs; their heads long and ugly, with large flagging ears, grey faces, and eyes sunk; necks long, and set on below the shoulders; breasts narrow and short, hollow before and behind the shoulders; flat sided, with high, narrow herring backs; hind quarters drooping, and tail set low. In short, they are almost in every respect contrary to what I apprehend a well-formed sheep should be."

Mr. Culley adverts, with proper reprobation, to the legal bars, which, at the time he wrote, subsisted to prevent the exportation of English live stock, so desirable, and so ardently desired by the Irish improvers; impediments which, I take it for granted, have been removed by the Union, if they really existed until that æra. However, in the following account of a

sale by auction of breeding stock, as long back as Oct. 5, 1770, he furnishes a very solid proof of the spirit of Hibernian improvement, and a determination among the improvers to overcome all obstacles.

66 Ewes sold to different people, amounted to	£.1094	5	5
9 Rams.....	352	12	6
5 Ram-lambs.....	29	0	1½
1 Stone-colt, 3 years old	170	12	6½
	<hr/>		
	£1646	10	7
	<hr/>		

One of the rams was sold to Edward Pearse, at 52 guineas, and the ewes to different people, at upwards of £20 each. In a few years, there is no doubt, but Ireland will equal this country in the quality of all kinds of live stock, and that the wools of Ireland will fully recover that reputation they possessed in former times.

SPANISH SHEEP, WITH THEIR VARIOUS CROSSES. In the early part of this Section on Sheep, the reader will have observed, that Spain, during many centuries, has been the great breeding country of fine woolled sheep, and the general source whence all the different countries of Europe, which have attempted the amelioration of their short, or carding wool, have derived their breeding stock. *Ozier*, a respectable French writer on sheep and wool, and a distinguished practical agriculturist at *Dissay*, near *Poitiers*, deduces the origin of the Spanish fine woolled sheep from a few individuals, imported from Africa, in the fourteenth century, by *Don Pedro*, King of Castile; he farther says, the blood was renewed and degeneracy prevented, by a second importation of African rams, by Cardinal *Ximenes*. In this research, it appears, *Ozier* has not gone sufficiently deep, since we know that a breed of fine woolled sheep, of Grecian and Asiatic origin,

already existed in Italy and Spain in the time of Columella, whose uncle, as has been shewn, (p. 248,) imported into Cadiz, African rams, which, crossed with his covered sheep, produced stock of a *rough and bristly fleece*. Nor am I aware that either ancient or modern Africa has ever produced originally fine woolled sheep. This repeated, and apparently systematic crossing with African rams, however, which practice might be still older than the earliest documents we possess, had doubtless some particular aim, and in my conjecture, it was to impart the quality of elasticity to the soft and silky *erythraean* wool; hence the firm and brush-like feel of the Merino fleece, and thus far are we indebted to Africa, in respect to our fine woolled sheep, and for the substantial and elastic quality of our English broad cloths.

The great and extraordinary pains which have been taken in Spain, for the preservation of this invaluable breed of animals, pure and entire, throughout such a series of ages, is fully intitled to all that approbation which has been bestowed upon it; but in respect to their peculiar management in Spain, very little of it is applicable to the widely different circumstances of this country: in truth there are other countries on the continent, whence we may draw examples with far more profit. Our chief information on the management of the Spanish flock, is derived from a letter of Don John Bowles to Mr. Peter Collinson, which the curious may see at large in the Gentleman's Magazine for May and June, 1764. The Don was not intimately in the secret, as a sheep-husband, and with a number of useful remarks, has mixed others not altogether so useful, because not so true.

The most material part of the substance of this letter, followeth. There are two kinds of sheep in Spain, the coarse-woolled which remain constant and

stationary, and are housed every night in winter, and the fine woolled, which are, during all seasons, in the open air, and which travel every summer, from the cool mountains of the northern parts of Spain, to feed, throughout winter, in the south, on the warm plains of Andalusia, Manca, and Estremadura.

Five millions of fine-woolled sheep (then) in Spain, formerly the property of the Spanish crown, but alienated at various periods, still however retaining the name of royal flocks. Ten thousand sheep compose a flock, which is divided into ten tribes, under the command of one man, who is absolute over fifty shepherds, and fifty dogs, five of each to a tribe; his salary forty pounds per year, and a horse. His first shepherd has only forty shillings a year, the wages decreasing in a certain ratio downward, to the boy, who has ten. Exposed every day in the year, all weathers, and lodging by night in huts, yet these wretches generally live to old age, twenty-five thousand of them in Spain, having the honour to exist (says Don Bowles) for the purpose of clothing kings in scarlet, and bishops in purple. The dogs are of the large mastiff species, and are allowed two pounds of bread each per day.

The greatest quantity of SALT is allowed the sheep upon clayey soils, but none on limestone lands, whether downs or stubbles. Average weight of ram fleeces, upwards of 8lb. each; of wethers, upwards of 6lb., of ewes 5lbs. In the end of September, by old custom, a paste of red ochre and water is daubed upon the backs of the sheep, from the neck to the rump. Their journey is 150 leagues, which they travel in less than 40 days.

The lambs are dropped at Christmas, and in March the following OPERATIONS are performed on them. Their tails are cut off five inches below the rump.

They are marked on the nose with a hot iron. Part of the horns of the rams are sawed off, that they may not hurt each other. Those which appear docile, and are intended for bell-wethers, are emasculated by turning the testicles twenty times round with the finger, no incision being made, but the spermatic cords are twisted like a rope, and decay without danger.

After SHEARING, the whole pile of wool is weighed, and each fleece divided into three sorts: the back and belly give the superfine, the neck and sides the fine, the breast, shoulders, and thighs, the coarse wool. Although a different price is fixed upon each sort, by general custom, the whole is sold at a mean price. When the wool is for exportation, it is sold after being washed, as it never loses less than half its weight, and often more, when the sweating of the sheep has been violent; of course, half the carriage is saved by washing.

Don Bowles continues:—"It is to be ranked among vulgar errors, *that sheep prefer aromatic plants, and that mutton fed upon hills where sweet herbs abound has a fine flavour.* On the contrary, as my duty obliged me to pass hundreds of days at the *Platillo* mine of *Molina*, where thousands of sheep were feeding around, I observed that when the sheep fed at will, they sought only the fine grass, and never touched any aromatic plant, and when the creeping *serpillum* was interwoven with the grass, the animals industriously nosed it aside, to bite a blade of grass, which trouble soon caused them to seek out a pure gramineous spot. Yet when the shepherd perceiving a threatening cloud gave a signal to the dogs to collect the tribe, that he might lead them to shelter, the sheep having no time to stoop and choose, would take a snap as they walked of rosemary, or of any other

shrub in their way ; for sheep will eat any thing when hungry, or when they are driven in haste, even henbane, hemlock, or the most nauseous and poisonous weeds, especially upon their issue out of the shearing-house. Were sheep fond of aromatic plants, it would be one of the greatest misfortunes which could befall the farmers of Spain, where the number of bee-hives is incredible ; and I am almost ashamed to give, under my hand, that I know a parish priest who had five thousand hives.

“ It is a principal care of the shepherd not to suffer the sheep to leave their *toils* until the morning sun shall have exhaled the WHITE HOAR FROST, and never to suffer their approach to a pond or rivulet after a SHOWER OF HAIL, for both the dew upon the grass and hail water are extremely pernicious, often fatal to sheep. Hail water is also unwholesome to human creatures, and the drinking it may be sometimes the concealed cause of epidemics.

“ The sheep of *Andalusia*, which never travel, have COARSE, LONG, HAIRY WOOL. I saw a flock in *Estramadura* with wool trailing on the ground. The itinerant sheep have short, silky, white wool. *I do believe, from a few experiments and long observation, that if the fine-woolled sheep stayed at home in the winter, their wool would become coarse in a few generations. If the coarse-woolled sheep travelled from climate to climate, and lived in free air, their wool would become fine, short and silky, in a few generations.* All the animals I know which live in the open air constantly keep up the colour of their sires. Constant heat or constant cold, with housing, are the causes of coarse, black and speckled wool. There are the most beautiful brinded sheep in the world among the coarse-woolled sheep of Spain. I never saw one among the fine-woolled flocks ; the free but less abundant per-

spiration in the open air, is swept away as fast as it flows. Whereas it is greatly increased by the excessive heat of numbers housed all night in a narrow place. It fouls the wool, makes it hairy, and changes its colour. The SWINE of Spain, which pass their lives in the woods, are all of one colour, as the wild boars. They have fine, silky, curled bristles. Never did a Spanish hog's bristle pierce a shoe."

Previously to any remarks on Bowles's account, we will speak farther, if not definitively, on the origin of the fine-woolled sheep. Of the Asiatic and Grecian descent of those of Spain, I have, in my own mind, not the smallest doubt. As little doubt do I entertain of the Spanish origin of our own clothing-wool sheep; their form, the colour and nature of the fleece they bear, to speak of those which betray the least mixture of blood, fully evince it. The story of Spain having derived her fine-woolled breed from our Cotswold hills, appears to me rather adapted to the Peruvian tales than to the page of authentic history. I must own I am guided more by analogy of form and quality, both of wool and flesh, than by either history or tradition, but I cannot yet avoid paying the merited degree of attention to the *Memoirs* of the *ci-devant* Royal Society of Agriculture at Rouen, nor ought the mere opinion of Dr. Campbell, in opposition to its authenticity, be held decisive. Every one versant in the early periods of our history, must be well aware of the paucity of materials, on any subject, exclusive of war and court intrigues, also that much is to be found in the archives of France, which bears relation to the affairs of this country. The compiler of the *Memoirs* says, that in the fifteenth century, our Edward IVth obtained a considerable flock of fine-woolled sheep from the King of Castile, which was the original foundation of the ex-

cellence of our clothing wool. That properly qualified persons were appointed to superintend the distribution and management of the Spanish sheep. That two ewes and a ram were sent to every parish, in which the pasture was judged suitable to such stock, the care of them being entrusted to the most respectable yeomen, on whom particular privileges were in consequence conferred. Written instructions for the management of these sheep were also delivered to the shepherds, who were taught to select the finest native ewes for the Spanish cross, in order to the general improvement of our wool. Henry the VIIIth and Queen Elizabeth are said also, on the same authority, to have paid great attention to this important object, which I think highly probable, from a similar care in the two last Henries, in respect to the breed of horses. Nothing even can be more probable, than that importations of sheep might be made, during our connection with Spain, in the reign of Philip and Mary.

It is equally within the range of probability, that Edward IV. might have learned to cross the breed of animals, with the view of improvement, from the Spaniards, since we know that such practice had been successfully pursued in their country, even in ancient times. Thus the sheep of England and Wales were crossed in different districts, and the varieties produced, which we at this day witness. In some parts probably, in the Cotswold hills for instance, and in Herefordshire, for reasons unknown to us, a considerable portion of the Spanish stock might be retained pure and unmixed, whence the present superiority of the latter breed, and its approximation in form to the Spanish. Markham mentions the wool of the Lempster side of Herefordshire, and of Worcester, joining upon Shropshire, as having "such a

curious fine staple, from whence you may draw a thread as fine as silk." That our fine-woolled sheep have continued since gradually to degenerate, appears from history and tradition, and from the well-known, constant practice of adopting the long-woolled cross, on every occasion of improving the soil. It is curious on two accounts, that Markham notices the sheep of the Cotswold hills, as "of better bone, shape, and burden, than the others, but with wool of a staple coarser and deeper," because he wrote about the time, when the supposed supply of fine-woolled sheep were sent from the Cotswolds to Spain; and because if his account be correct, the Cotswold farmers have twice changed their stock, from long to short, and from short to long wool again.

The investigation would be too extensive, granting sufficient and authentic documents could be found, to trace our commercial and manufacturing habits respecting wool, from the periods above cited, to the present. It is to be presumed, that formerly, we needed far less assistance from foreign countries in the manufacture of our fine fabrics, than we have, during the last century, and at present, been in the habit of receiving; that a greater dependance was placed in the quality of our native clothing wools, until a neglect of those was induced by the custom, which became at length established, of drawing, indeed a superior commodity, from Spain: the great extension of tillage in latter times, and the concomitant predilection for large sheep and long wool, together with a very natural prejudice in the importers and manufacturers of foreign wool in favour of a settled routine of business, which they viewed with the jealous eyes of monopolists, seemed totally to preclude the revival of all attempts at the improvement of our own clothing species.

But a sense of the obvious and great national benefits to be derived from such an improvement, ascertained also by the successful example of other countries, began to stimulate the minds of men of patriotic feeling. The King himself set a truly royal example, by being the first to import, in the year 1792, a number of Spanish rams and ewes, the benefits of which have been communicated to various parts of the country through the medium of Sir Joseph Banks. A considerable number of individuals in England, Scotland, and Wales, have made trial of the Spanish cross: reasons for the failure of some will be assigned, with proofs drawn from the most authentic sources of the complete success of others.

It may seem rather strange at first sight, that an attempt to improve our native fine wools, to the degree of rendering us independent of foreign supply, should be opposed by our manufacturers, which yet has been too notoriously the case, until of late; but bodies of men can ill suffer any interference with their settled customs, which, right or wrong, they ever presume to be intimately connected with their interest. Their printed arguments were primarily drawn from Don Bowles's narrative, just now quoted, and their chief stand was made on the supposed necessity of a warm climate and annual journeys, to the creation, at least preservation, of fine wool. The reader will have observed lines in Italics, to this effect, in Bowles's letter. The absurdity of such positions was not indeed perceived here so early as it was known upon the continent, but the fact of repeated practice, in our own country, through a considerable number of years, now saves us the trouble of argumentative confutation. Dr. Parry's remark on this head is not more concise than rational and conclusive. Speaking of the *Estantes and Trashumantes*, or the stationary

and travelling sheep, he says, "*the former are not permitted to travel because they are coarse, not that they are coarse because they do not travel.*" Doubtless the original motives of the Spaniards for annually driving their flocks such an immense distance across the country, had very different objects to those of preserving their wool, yet the people, always forming a judgment from the appearance of the superficies, seeing long-woolled sheep stationary, and the short-woolled travelling, concluded, without the fatigue of reflection, that rest and motion were essential governing principles in the nature of wools. With what facility might not this hypothesis, like many others which have yet retained so strong a hold on the brains of men, have been overturned? Simply by turning a few *estantes* or long-woolled tups among the travelling ewes. That injudicious coting, and keeping the sheep too warm and close, fouls and injures the wool, is clear enough both from reason and the faulty practice of many parts of the continent; nor do I think Don Bowles was in an error, respecting the preference which sheep have for natural grass over all aromatic herbs: such, I believe, to be the fact, although I formerly concurred in the popular notion.

The opponents of improvement have insisted, indeed do still insist, in the face of ocular demonstration, and reiterated annual proofs to the contrary—that *fine wool degenerates out of Spain, and that none grown out of that country can be adapted to the purpose of making fine cloths and kerseymeres. That such are made of Spanish wool alone. That could we in this country even equal the quality of Spanish wool, the balance of profit would still be against us, from the necessarily consecutive loss in the weight of carcase. That the winter care and coting required by Spanish sheep would be, here, too expensive, and even imprac-*

ticable, except to gentlemen, who can afford to build sheep-houses, and to expend their money in these, or any other speculative novelties, &c. &c. The pretence that fine cloths are made entirely of Spanish wool is not generally insisted on, yet in the account of Thetford wool fair, 1802, (*An. Ag.*) we find it very strongly affirmed by a manufacturer. Various facts tend to prove the unaccountable aversion of the wool-buyers to any attempt at amelioration, for example, the fixing of general district prices, which must necessarily confine the growers whole attention to weight; the almost invariable refusal, until of late, to allow any advance for improved superior quality, and the strange preference shown, in many parts of the North, to salved or tarred wool. It is a curious coincidence, that, as we learn from Lasterie, the manufacturers, buyers, and importers of wool, of every country in Europe, where an improvement has been attempted by the landed interest, are in the same story; the strongest proof, either of inveterate prejudice, or an exclusive interest in the one party, or of ill-directed enthusiasm, error, and deficiency in the other. The point in dispute, to wit, the introduction of superfine wool, and the amelioration of our native fine wools, have been held out as objects of vast individual and national emolument, let us, in the first place, by a statement of material facts, and subsequently, by an adduction of such reasoning as naturally flows therefrom, enable the British farmer to judge for himself, on the question, previously to committing himself in any practical attempt.

In reply to the objections of the commercial men, just stated—*Spanish sheep have succeeded and improved in carcase, the wool retaining its genuine fine quality and full quantity, without the smallest symptom of deterioration, in almost every country upon the con-*

inent of Europe, even those of the most unfavourable soil and climate, at the Cape of Good Hope and Botany Bay, through a long course of years; in Saxony upwards of fifty, in Sweden more than fourscore. The fine cloths made from such naturalized wool have given general satisfaction, with the exception of those who appeared to have an interest in being dissatisfied. Patterns of superfine cloth made from His Majesty's and Lord Somerville's home-grown Spanish wools are now before me, which I am assured by individuals of the trade, who work up the cloth, are fair merchantable samples, no wise defective in regard to the wool, but if at all, in the manufacture only. That cloth of such home-grown Spanish wool, when fairly manufactured, has ever been rated equal in quality with the general run of superfine cloths. That the assertion must be groundless, of superfine cloths and kerseymeres being manufactured of Spanish wool only, since it is well known, that the quantities annually imported have been totally inadequate to such purpose. That, as English wools, in their unimproved state, necessarily go into the composition of fine cloths, and as in strong probability, much superfine cloths have been constantly on sale, which never contained any Spanish wool at all; there is the stronger plea and encouragement for the improvement of the said English wools. That the samples of home-grown Spanish wools, whatever may be their intrinsic merit, have at least so much deception, that the dealers are frequently at a loss to distinguish them from imported Spanish, and have been sometimes known to prefer the former. That the wool-buyers acknowledge this equality by the nearly equal prices they now give, and also the reality of the improvement from the Spanish cross, by the great advance of price they have allowed on the improved native wools. These wools also are nearly or altogether doubled in quantity, by

virtue of that cross. That no loss in carcase, or mutton per acre, is a consequence of the Spanish cross, because of the superior number of a smaller breed, which the same acre will feed. That the Spanish mutton is equal to any in the world, and the species small boned, and very apt to take on fat. That neither better care nor better keep is required by the Spanish sheep, than the English, but that one as well as the other requires more of both than they generally have. That the improved species is, in all respects, equally well calculated for the use and profit of the tenant, as of the landlord.

It is proper that I produce my authorities for the above-asserted general facts, and, as the business of improving clothing wool, has within the last century, at least, been prosecuted much earlier, and to a far greater extent, upon the continent, than in this country, I shall begin with that of C. P. Lasteyrie, member of the *Société Philomatique* in France, author, in 1798, of a Treatise on Spanish sheep, and in 1802, of a History of the Introduction of fine-woolled Spanish Sheep into the different States of Europe, and to the Cape of Good Hope, with their number, actual state, mode of management, and advantage to agriculture and commerce. The latter book only I have seen, and would health and other literary avocations permit, I should be happy to present it to my country, in an English dress, as one of the most able, judicious, and useful performances on those important subjects, which it pretends to treat. The author, I find on inquiry, is a man of considerable fortune, and most respectable character, and has travelled over great part of Europe, at his own expense, in order personally to examine the state of the sheep husbandry, in the various countries, at present, the theatre of improvement. He possesses ample information on

this subject, and appears to be actuated by the most liberal and enlightened principles.

According to Lasteyrie, attempts were made at improvement, in SWEDEN, in 1716, and in 1723, the first Spanish fine-woolled sheep were introduced. In 1764 the number of the pure race of naturalized Merinos, amounted to 65,369; of the crossed breed, to 23,384, which last produced wool of good quality. As the breed of sheep and the woollen manufactory have been increasing since that period, he estimates the present number of the pure Merinos in that country, at 100,000, or the twenty-fifth part of the aggregate number of sheep of all kinds, in Sweden. In the long period of fourscore years, the Merinos (when well fed) have lost, neither the original thickness, fineness, length, nor elasticity of their fleece, but at this instant produce wool, in all respects, equal to the native Spanish. He saw in Sweden, rams, the fleeces of which weighed 13lbs. each, and remarked that the naturalized Merinos were larger and stronger than those bred in Spain.

In DENMARK and NORWAY, he saw that wild breed of sheep, which brave the utmost rigour, and the most sudden extremes of that frozen clime; which exist throughout winter, amidst the snows, without receiving the smallest assistance from the hand of man. He saw also in Norway, the breed of *beaver* sheep, which is found in Shetland, and compared their wool with a sample which he had procured from Scotland, and with the fine-woolled sheep of Iceland already described. They have the custom, in these countries, of shearing sheep several times in the year, which injures the quality of the wool, and renders it an inferior article of manufacture. In Denmark, and more or less throughout the continent, the opposite extremes of bad practice prevail, animals are alternately ex-

posed to extremity of cold abroad, and of a suffocating heat in their houses. Sheep can however endure cold better than heat.

The Danish government imported from Spain in 1797 three hundred *Merinos*; this flock was composed of the finest and most valuable breeds which could be procured, namely, of the variety of the *Escucial*, of *Guadaloupe*, of *Paular*, of the *Duke of Infantado*, the *Compte of Montarco*, and of the *Negretti*. The first is esteemed the most perfect of all the travelling flocks of Spain, for fineness of the wool, the second for good shape, abundance and fineness of fleece: the ewes of the third breed, (*Paular*) with similar qualities of wool, have somewhat greater length of body: the lambs of that breed, and those of the *Infantado*, are commonly dropped with a thicker covering, which changes into very fine wool; the *Negretti* are the largest breed in Spain. Only two of this flock were lost from the fatigues of the voyage, and from an exposure to the rigours of a Danish winter, and the heavy rains of spring.

The government of Saxony received from Spain, in 1765, one hundred rams and two hundred ewes, of the best blood. During a few years, the improvement of the Spanish cross was opposed by the common prejudices of the farmers, but they afterwards became so convinced of its utility and importance, and were so desirous of becoming purchasers, that the electoral flocks were insufficient to supply the demand, on which account, another importation of the same number with the first, was made from Spain, in 1778, and part of the flock distributed at prime cost. It was found by comparison, that the wool of the first importation had, in no respect, degenerated. But Lord Somerville has produced the best proof of the undeniable excellence of the Saxo-Spanish wool, by stating,

that 200 bags of it were imported into this country, in 1802, and sold at the prime price of native Spanish, the cloth it produced bearing an equal character. Lasteyrie yet saw in Saxony, races which had degenerated *from injudicious crosses, want of care, insufficiency and bad quality of food, and the insalubrity of the sheep-houses, where, according to the custom of the country, the dung was left the year round.* Such are the causes of degeneration both of wool and carcase, as well in Spanish, as in all other sheep. *The manufacturers of fine cloth in Saxony, finding in their own country, both quantity and quality of wool, equal to their demand, have long since ceased to import from Spain, and have nothing farther to dread on the score of risk and disappointment in their commerce.* Farther, the Saxons even grow a surplus of fine wool for exportation, equal in quantity to their home consumption. Unrestricted commerce is a policy of that patriotic government, which a certain other government, of far greater power and extent, would do well to imitate. Saxony maintains 1,600,000 sheep, of which, 90,000 are fine woolled, including thorough bred and crossed.

PRUSSIA received from Spain 200 ewes and 100 rams, in 1786, for the purpose of improving its native breed. Part of these imported sheep died of diseases, near Berlin; more have degenerated from the neglect and ignorance of the Prussian farmers: but in a subsequent supply of Saxo-Spanish sheep, under the direction and encouragement of the government, Prussia has been more fortunate. Her native wools have equalled the Spanish, and her manufacture of cloths has been tripled within thirteen years. M. Fink, a celebrated rural economist, has been sent into Spain, by this enlightened government, where, two years since, he purchased a flock of a thousand Merinos. The Compté

de Magnis, a patriot, who has exchanged the life of a courtier, for the more innocent and more useful occupation of improving the soil of his country, possesses a flock of 9000 sheep on his estates in Silesia, from which he derives an annual benefit of 106,000 franks. The Compte is the most renowned tup-breeder upon the continent; and beside procuring Spanish sheep, has collected the best breeds to be found in Germany, often going to the price of ten and twelve hundred franks for a ram. He has, by crossing, united size and form, with quantity and quality of wool, and his breed, at this instant, is the largest and best formed upon the continent.

IN AUSTRIA, BOHEMIA, and HUNGARY, notwithstanding that a decided success did not attend their first trials, they have, at present, as in Saxony and Silesia, many flocks of thorough bred fine-woolled sheep, and of the ameliorated races. The Empress Maria Theresa made the first importation of Merinos in 1776, since which period, several successive lots have been introduced from Spain. A school for shepherds, with ample instructions, was founded by the Empress, at *Mercopail*, where the Spanish flock was placed.

The improvement commenced in 1788, in the *Margraviates* of *Anspach and Bareuth*, with *Saxo-Spanish*, *Rousillion*, and afterwards with pure Spanish sheep, and in 1797 there were at *Rolenhof* (the shepherd's school) 425 thorough bred fine-woolled sheep, and upwards of 8000 of the crossed and improved breed dispersed through the *Margraviates*. The breeders having failed here, as in the Austrian states, in their first attempts, from making use of inferior stock, the government issued instructions on that head: and when afterwards, *for want of fairs and from the interested views or prejudice of the buyers, a price much below the real value of the improved wools, was of-*

ferred, the government also took measures to assure to the wool growers a vent for their commodity, on adequate terms.

The DUKE OF WURTEMBERG began in 1786 by establishing sheep folds at *Justingen*, which he afterwards placed under the care of two shepherds, instructed by the celebrated Daubenton. The number of Merinos at *Justingen* were about 500, and by the annual distribution of tups from thence, a sensible improvement has been made in the indigenous breeds of the Duchy.

The illustrious MOREAU, a friend to the arts of peace and humanity, and particularly attached to the culture of the soil, presented to the Agricultural Society of *Strasbourg*, 32 Merinos, which he had received by convention from the states of Wurtemberg. In MECKLENBURGH, ZELL, LUNENBURGH, HANOVER, BRUNSWICK, and almost every part of Germany, the improvement of their clothing wool is proceeding with the best prospect of success.

In FRANCE, the attempt to ameliorate their wools, by the introduction and use of Spanish and English rams, seems first to have been made by the great minister Colbert; and although the plan, however patriotic and useful, met with great opposition, it must have been pursued, since we find, in the early part of the last century, that Spanish sheep had multiplied in many parts of France, and were found in all respects superior to the native breeds, which were at that period already much improved. In the middle of the last century, the first regular essays were made, towards the growth of superfine wool, by M. de Perce, which excited public attention, and which may be esteemed the foundation of that complete success, in consequence of which, France has since fully equalled and rivalled the finest native wools of Spain.

But the consummation of this great national object was left to the venerable and scientific Daubenton, who still survives. Daubenton, with the assistance of M. Trudaines, father and son, and of M. de Laverdy, comptroller general of the finances, established a sheep-farm near the village of *Montbar*, in Burgundy, a district, in a small degree, mountainous, and thence adapted to fine woolled sheep. It was there they collected rams from *Roussillon*, *Flanders*, *England*, *Morocco*, *Thibet*, and *Spain*, with the intent of experimental crosses. No houses were built, but the sheep were kept the year through in the open air, with the most perfect success, an account of which was given at a public meeting of the French Academy in 1769. In 1776 another supply of rams and ewes was received from Spain. In the mean time, all the varieties were kept distinct, and afterwards intercrossed in order to determine which tended most to the production of fine wool. This great and long continued attention was in the end rewarded with products of fine wool, of a nature so perfect, that in these flocks, there no longer existed any need of assistance from Spain.

From the wool of *Montbar*, washed on the sheep's back, in 1783, Daubenton caused to be made superfine cloth of various colours, for which the manufacturer engaged to pay the highest price then given for cloth made of imported Spanish wool. A second essay was made the following year, and cloth produced more supple, and equally soft and fine with the best Spanish, at the same time, of more substance and elasticity. Various manufacturers now made comparative trials, the general result was, that Daubenton's wool produced cloth, fully and entirely equal to that made of superfine imported Spanish wool, and that it took a beautiful scarlet.

Notwithstanding this successful beginning, prejudices similar to those which exist in England at this day, retarded the progress of the improvement of wool in France, until its revival in 1786, by the establishment of the Royal experimental breeding farms, at *Rambouillet*. By the King's order, upwards of 300 ewes and rams of the finest breeds of Spain, were driven from thence to *Rambouillet*, under the conduct of Spanish shepherds. Seventy perished on the journey, and upwards of thirty ewes and seventy lambs were lost by the foot rot after their arrival, which disorder would have been far more fatal, but for the judicious precautions taken.

From the commencement of the Revolution, the flocks at *Rambouillet*, frequently menaced by the exigencies of the times, with dispersal and destruction, were put under the care of a commission of agriculture, consisting of ten members, most of them of distinguished reputation for veterinary and economical knowledge. The establishment thus continued to prosper, and annual sales were made of rams and ewes, which were, by that mode, distributed over the territory of the Republic. It was remarked, that although the native Spanish sheep, introduced at various periods, were of an uncouth and irregular shape, yet their progeny at *Rambouillet* became superior in size, form; and goodness of constitution, losing nothing in the fineness, strength and abundance of their wool; which, in spite of combinations among the buyers, has continued gradually to increase in price, until the present time, and is now probably, in certain respects, even superior to the finest wool of Spain. That the fine wool of *Rambouillet* has not degenerated, his Grace the Duke of Bedford, as I am well assured, had an opportunity of witnessing, whilst lately in France, by a comparison of samples of the annual growth,

from the first year of the establishment. The Duke, as a great and patriotic British landholder, really is what he ought to be, a first rate judge both of sheep and wool.

The quantity of fine wool given by the sheep at Rambouillet, amounts to 7 or 8lb. per fleece, some individuals affording as much as 12lb.; a certain ram sheared 16lbs. whereas the ordinary average produce of wool in France, had never previously exceeded 3 to 4lb. each fleece: the improvement, therefore, in point of weight and quality conjoined, is immense, indeed beyond all calculation. Since the prejudices in France against the Spanish cross have worn away, the price of those sheep, and of the improved breeds, as might be expected, has had a great advance. Those who are fortunate enough to possess the pure Merinos, will not sell them for less than 150 to 250 francs, whence a fraudulent species of jockeyship has been too prevalent, that of putting off rams of the first cross, and second as being of the fourth or fifth; and of warranting such as have merely a good shew of blood, for pure unmixed Merino. *Caveat emptor*, French or English. Maximum price of a tup or ewe in 1798, 200 francs; in 1802, 630. A franc is about twenty pence English. For the first three years of the above period, the ewes fetched a higher price than the rams.

Lasteyrie records the experiment of suffering the wool to remain unshorn two years, which produced a double length of staple of the usual fineness, without any other inconvenience to the animal, than, if a ewe, rendering it difficult to suckle her lamb, from the impediment of the lengthened fleece. A report has been since made by *Huzard* and *Tessier*, of the same experiment on a number of sheep being successfully continued three years. The fleeces were thrice the length of the yearling fleece, and sold for a higher

proportionate price, which circumstance may probably do away the objection I have made to this plan. The same managers in 1802 made the comparative experiment of shearing lambs the first year, that is, at the age of about six months, or suffering them to remain unshorn, as usual, until the second year. The result was, that the single shearing of the second year, equalled the quantity of the two shearings; and being longer, and of a better staple, was of greater worth in the market; a result of which we were previously apprized in England, but are nevertheless indebted to the establishment at Rambouillet, for so accurate a confirmation. The shearing of summer lambs destined to market, as in Dorsetshire, is another affair. Citizen *Yvard*, not satisfied as to the correctness of the above experiment, made another, after the mode of shearing half, and leaving unshorn the other half of the fleeces of the same individuals, by which it appeared, in conclusion, that a superior weight of wool resulted from twice shearing: but without having room to state my reasons, I prefer the first method, as most advantageous.

But it must be acknowledged, on the authority of the following experiment conducted by Citizens Tessier and Huzard, that the Merino sheep of France make a very poor figure in the FATTING-STALL. Three sheep of equal age, store weights between four and five stone the carcase, were put up and fed with lucern, hay and corn, twelve weeks and two days; during which time, they each consumed 281lbs. or $3\frac{1}{4}$ lb. per day; being slaughtered, the smallest weighed $99\frac{1}{2}$ lbs. in gross, and 51lbs. or 6 stone 3lb. the carcase. Offals, including $7\frac{1}{2}$ lbs. the fleece, 6 stone $\frac{1}{2}$ lb. The offals of an English long woolled sheep, 20 stone 4lb. the carcase, the account of which is before me, weighed $11\frac{1}{2}$ stone. From these accounts compared, the most

important conclusions will be drawn by the thoroughly informed. The Merino mutton, it appears, was found excellent, of the truth of which no one need doubt.

The author next proceeds to give an account of the Merino flocks of *Pompadour*, *Perpignan*, and *Ver-sailles*, seven different races of native French sheep, and speaks of the erection of washing houses after the Spanish mode. Besides sheep, at Pompadour, they had 19 stallions, and 13 brood mares, with Tuscan asses, and bullocks and buffaloes from Limousin and Romagna. At Alfort, a shepherd's school has been founded, where the pupils, in conjunction with those of the veterinary class, are taught the anatomy and physiology, and natural history of the sheep, with relative medicine and surgery, in addition to their proper business as shepherds. What kind of preparatory education these French shepherds may have received, I am ignorant, but if it be upon a level with that of their peers in this country, I must own, I have no great expectation of the success of suddenly overcharging their heads with so much, such various, and incompatible learning. I do not by any means entertain so magnificent an opinion of similar institutions, as I formerly did, and have lived to see many a harmless blockhead, after a few months instruction, come forth a most dangerous coxcomb. It was proposed to collect at Alfort, the indigenous races, bearing characters the most distinct, with the view of experimentally determining the result of a Merino cross, in addition to which, Lasteyrie very judiciously advises the same measure with Friezland, Texel, Moldavian, and Paduan sheep. A comparative table is given of the eight races at Alfort.

The number of improved clothing wool-sheep in France, in 1802, amounted to a million, of which

about fifteen thousand were thorough bred, or of the pure race: they have, doubtless, increased since in a high degree. Twenty of the departments, or districts, had already demanded of government, a supply of Spanish breeding stock. The Directory, by a secret article in the treaty of Basle, had contracted to draw annually from Spain, during five years, one thousand Merino ewes and one hundred rams. That agreement had not been completed in 1802. Wool fairs are established in France, and Huzard, the colleague of Lasteyrie, writes exultingly, *that the million of fine woolled sheep they possess, will produce two million pounds of washed wool, from which may be manufactured one million ells of cloth, sufficient to clothe five hundred thousand men.* Lasteyrie, ardent himself in this patriotic career, complains of some relicts of prejudice yet in France, and of the apathy of many principal manufacturing towns, yet doubts not the ultimate universal success of the Spanish cross.

HOLLAND. The Dutch have one premium on the breed of large sheep; they pay a tax of twenty-six pence a head on sheep in general. Lasteyrie thus describes the famous Friezland sheep, whence we derive the origin of our Durham or Teeswater breed. Of prodigious size and beautifully formed, great breeders and milkers. He measured some which made two feet nine inches, from the withers to the extremity of the back, and four feet five inches and half, from the muzzle to the root of the tail, which is without wool, nine inches long, and the size of a little finger, at the inferior extremity. Polled. Head eleven inches, the ears nearly eight inches in length. Fleece sixteen or seventeen pounds of a silky wool, fifteen inches long, and very fine for long wool. Not apt to make fat, but particularly, very poor, in the milking season. They have the dug as large as a

goat, and are milked twice a day, giving a pint each milking. Produce of lambs from three to five at a birth. The Texel sheep are a smaller variety of the above, doubtless from a cross with the two breeds, which are to be found also in Holstein, on the shores of the Baltic, and in Sweden and Denmark.

The chief of the Merinos, in Holland, seem to be in the hands of M. Twent, who feeds them indifferently in the dry grounds, or the marshes, folds and manages them precisely in the same manner as the native sheep, and with perfectly similar effects, excepting that the Spanish sheep are not so liable to rot in wet grounds as the other. He feeds these last in the stall with the rest, on turnips, beets, rapé, hay, and corn, and finds that they fatten equally well, and that no change is made in their wool by his method of treatment. The Merinos shift on the commons and highways, or the woods in summer, but are taken to cover at mid-day, when very hot, and never left in the fields at night. M. Twent has supposed, from observations made during a dozen years, that alder leaves are a preservative from the rot, even when the sheep are fed in wet grounds; that they are fond of those leaves; and that nature has pointed out that antidote to them, in continued rains, which induce rottenness in sheep. All this I repeat *pro forma: credat, quis credere possit*. He never allows his sheep any salt, because they enjoy a constant good state of health without it.

ITALY. Piedmont began in the year 1793, after the example of France, to ameliorate her native wools with the Spanish cross, and has, by this time most probably, obtained a quantity of fine wool from her own soil, fully adequate to the demand of her manufacture. A sheep establishment was formed in the beautiful situation of La Mandria, the buildings being

placed in the centre of eight hundred acres of land, which furnished both summer and winter provision for the flock, besides the contiguous advantage of annual walks upon the Alps, during the hot season. A rivulet runs close to the buildings, which are spacious, and most commodiously arranged for every purpose of shelter, fresh air, and feeding, the management being placed in the hands of a chief selected from amongst the class of intelligent shepherds. The flocks are driven to the mountains early in June, where they remain until late in October; the winter and spring they pass in the fields, or at the home fold, according to the indications of the climate, and they are always full fed, and sedulously attended, in every season, whence diseases are generally unknown among them, excepting the rot and giddiness. Lasteyrie remarks, that these fortunate and successful shepherds would have nothing left to desire, could they avoid the above destructive maladies, for the first of which he prescribes sound and dry land, and for the other a change of tups; the first prescription, in my opinion, far the most rational.

The flocks of La Mandria take their walks soon after they have lost their coats, whence the pure mountain air has the more powerfully refreshing and salutary effect upon their bodies. It is there that the rams are put to the ewes, with which they remain forty days. The ewes bring forth in December, and abortion is very uncommon. They are not suffered to couple until at full growth, namely, the ram in his third year, the ewe in her second. The lambs are weaned at six weeks, and never shorn until the second season. Folding is never practised with the intent of manure, but occasionally, for the convenience of the flocks. Upon this farm they had been previously

content with the growth of aftermath for winter use; but were about to make trial of potatoes.

It would be difficult to find, or even for the most experienced to devise, a more complete system of sheep husbandry than this of La Mandria. But what forbids that we should, in this country, have our *bergeries à la mode de Mandria*, at the foot of our Grampians, and our Cambrian mountains? Let our great land proprietors answer to themselves that important question.

The management of sheep upon many parts of the continent, we find, from Lasteyrie, to be far superior to the general course of our own. They have set us the example of the Merino improvement of wool, and have pursued it to a far greater extent than we have hitherto had time sufficient to do; we have then the full benefit of their experience, in which is included the most direct and positive refutation of the *objections* of our importers and manufacturers of Spanish wool. The experimental breeding of live stock in France, more particularly sheep and horses, commenced earlier, and has been pursued through a longer course of time, than of which we were apprized in this country. On the principles of the latter object, they appear most defective, and on the science in general, they want those practical ideas, so to speak, which are perhaps yet unattainable out of this country.

Our own country authorities for the successful growth of fine wool are as follow—Sir Joseph Banks's accounts, in the *Annals of Agriculture*, of the King's Spanish flock at Windsor—Lord Somerville's two publications already quoted—Dr. Parry's *Book—Various Essays and Memoirs* of Mr. Bartley, Secretary to the Bath Society, and a late memoir in the *Annals of Agriculture*, by George Tollet, Esq. of Swinnerton,

Staffordshire. The above are all experienced and practical flock-masters, well informed on the qualities of wool, and have repeatedly put their speculations thereon to the unerring test of manufacture.

The shearing of Merinos in 1802 was the tenth at Windsor, and no second importation had been made. The wool, producing nearly five-sixths of prime, and only one-fourteenth of fribs, is a proof that it had suffered no degeneration, during the ten years since the sheep had lived in England.

In 1800 the King's flock of 100 ewes and wedders, sheared 398lb. of wool washed on the sheep's backs. Loss in scouring, 104lb.—sorted, it produced 234lb. prime wool, sold at 5*s.* per lb.—34lb. choice, at 3*s.*—26lb. fribs, at 1*s.* 6*d.*

In 1801—108 ewes and wedders sheared 397lb. Loss in scouring 112lb. The sorted wool produced 237lb. prime at 5*s.* 6*d.*—Choice 31lb. at 3*s.* 6*d.*—Fribs, 17lb. at 1*s.* 9*d.* Of the wool of the rams and fatting wedders, kept separate, 138lb.; scoured, produced 26lb. prime at 5*s.*—choice 30lb. at 3*s.* 6*d.*—fribs 12lb. at 1*s.* 9*d.*

Eleven wedders were fatted in the marshes, and slaughtered; from the account of nine of them, sold by a butcher in Bond Street, London, the heaviest weighed 7 stone 2lb. the average weight somewhat more than 6 stone, average do. of the fat, about 9lb. I have before noticed the superior excellence of Spanish mutton, at least such is the award of the memoir before us, and, if that can be of any additional consequence, of my own palate. Travellers who have eaten ram and old crone mutton, as lean and tough as carrion, of which there is usually plenty in the markets of Madrid, must not thence form a judgment of Merino mutton in its best state. The skin-wool of these eleven sheep was taken off, in order to ascertain its value.

It weighed, in the yolk, or grease, 36lb. and lost 8lb. in scouring. The scoured wool was sold at 4s. 6d. per lb. making 10s. a sheep, all expences deducted.

In 1800 were disposed of eight rams and nine ewes, all which could be spared. Two of the rams went into Dorsetshire. An experiment is noted of three two year old sheep, a real Dorset, an half Spanish and half Dorset, and a do. Mendip. The first being slaughtered, reckoning the two years wool, yielded £4. 5s. 6d. The second, £4. 3s. 8d. The third, £3. 19s. 2d. This was surely a most encouraging experiment, since the two crosses must weigh upwards of eleven stone each, to make the money; and since they approached so near the value of the Dorset, a breed almost double the size of the Merino; the mixed wool, moreover, appears to have been much undervalued.

The account of another very important experiment is given. Mr. J. Ridgeway, of Yazor, in Herefordshire, fed together two sheep of equal weight, the one a Ryeland, the other half Spanish half Ryeland. *The half Spaniard produced in a year 2lb. 12oz. more wool, and 5lb. more mutton than the Ryeland.* Mr. Ridgeway has had some years experience of the Spanish cross, from rams of the Windsor flock, and proves, by his accounts, that the wool of his flock of about sixteen score sheep, has been so much increased, both in quantity and quality therefrom, as to have produced nearly twice as much money for each clip, after the Spanish blood had been established in it, as it usually did before.

Eight rams and twenty-two ewes were sold from the royal flock in 1801. More of the rams would have been distributed, but that the FOOT-ROT had prevailed among them, as it should seem, from the richness and moisture of the land, at Windsor, on which they were kept, since the sheep fed on the dry and

hilly pastures of Oatlands, have never been subject to lameness of any kind. In 1802 the price of the rams was advanced to six guineas each, that of the ewes, to two guineas, in consideration of the improvement, both in carcase and wool, which has taken place in this Merino flock, since its being fed in England. "And as His Majesty has been graciously pleased to continue to entrust the management of the flock to Sir Joseph Banks, all letters on the subject of it, addressed to him, in Soho Square, will be answered, and the utmost endeavours used to consult the convenience of those who wish to become purchasers." The enlightened part of the farming public will rejoice, to find this important affair in the hands of a gentleman so universally celebrated for his high scientific attainments, his love of the country, and regard for the interests and happiness of individuals, as Sir Joseph Banks.

Lord Somerville's two publications, in which this subject is treated at large, are in every body's hands; by the following extracts it will appear, that the noble Lord has fully accomplished one of his two objects—that of practically, and on a considerable scale, proving to his country, the immense advantages, both in an individual and national view, of the Merino improvement; his next, of diffusing this knowledge throughout every part of the country, adapted to the support of fine woolled sheep, cannot fail, in the course of time, of considerable success, from his unwearied exertions, supported by that high reputation in all matters of rural economy, which he has fairly, and laboriously earned.

About the year 1799, Lord Somerville made a voyage to Portugal, for the purpose of bringing home a breeding stock of Spanish sheep, in which, after considerable difficulty, risk, and expence, he succeeded

so completely, as to obtain a picked lot of the highest bred and best Merinos, both in respect of wool and carcase, which have, within memory, been imported into this country. His Lordship has since continued to import, and possesses, at this time, upwards of 150 of the pure, unmixed race, being, I apprehend, nearly, or altogether, one half of the number of pure Spanish sheep, at present in the kingdom. Lord Somerville procured the purest Ryeland ewes to be found at present in Herefordshire, with the addition of some South Down and Mendip, for the meditated improvement by his Spanish rams, and the whole flock at Fitzhead, I understand, amounts to between ten and fifteen hundred. There can be little doubt, but the noble Lord intends also to establish this breed upon his estate in Berwickshire, which will afford to our brethren, the enlightened cultivators of North Britain, an opportunity of making fair trial of the Spanish cross.

The first experiment recorded by Lord Somerville (see Facts and Observations, p. 2,) is on the wool of half bred Spanish and Ryeland, ditto and South Down, ditto and Mendip sheep. From the wool of this flock was manufactured the broad cloth and kerseymere, for which the premium was adjudged by the Bath Society. A lot of this improved wool being bargained for by an eminent wool-stapler in Southwark, in order to come at the real value, strict comparison was made between it, and the native South Down and Ryeland; the former being rated at the fair time price of 1s. 10d. per lb. the Ryeland 2s. 2d. untrinded: the result was, a price agreed upon of 3s. per lb. for the Spanish South Down, and 3s. 2d. per lb. for the Spanish Ryeland.

By Mr. Joice's letter, the manufacturer of the prize cloth and kerseymere, it appears that the wool manufactured had less F's and T's in it, than any wool

which had been manufactured for the Bath Society, *and much less than usually thrown from Spanish wool.* Account as follows—30 fleeces of Spanish-Ryeland wool, weight 96lb. when sorted according to the Spanish mode, making 89lb. *Rafinos*, 6lb. 8oz. *Finos*. 8oz. *Terceros* (superfine, fine and fribs)—47lb. of the R. when woaded and manufactured produced 28 $\frac{3}{4}$ lb. of navy blue cloth; the remaining 16lb. 6oz. of the R. made 25 yards of uniform white kerseymere.

The Spanish sires of the sheep, which produced this wool, were good in their frame; one of them, his fleece apparently not the finest of the flock, was let at one hundred guineas for the season. Eighty-six ewe-hogs of the mixed breed, carried 235lbs. 3oz. of well-washed wool, or about 2 $\frac{3}{4}$ lb. each, at 3s. 2d. lb. making, within a few shillings, £37. per pack. At a subsequent shearing, the clip of a number, something short of 800 sheep, amounted to 12 packs 1 score, which was sold for £442.

With respect to both wool and CARCASE, the produce of the Ryeland and South Down ewes crossed by the Spanish ram, keep such equal pace that Lord Somerville declares himself unable to assign a preference to either. The Ryelands are, on an average, one third less in size, than the South Downs, *but this inequality is perfectly levelled, by stocking of those one third more per acre.* The Ryelands are good nurses, and both those and the Downs are healthy and quiet stock, partaking of the docile temper of the Spaniards. The produce of the crosses, in stocking, bear the same proportion per acre, as the parent stock, *but the hogs are larger in size, than the Ryeland or Spanish full mouthed sheep.* Fifty Mendip ewes were put to the Spanish ram, and the produce for size, early feeding, and quickness of proof, did full credit to that excellent breed of hill sheep.

The wedders of these crosses come to market in mutton, at the same period with our earliest breeds, namely, at or before two years old, and like the South Downs, usually die well within, with good backs and loins, weight from 15 to 20lb. per quarter. They may be stocked very hard per acre. The same land which carried, but indifferently, 45 long woolled ewes, maintained, in good plight, 150 Ryelands, the lambs of which were weaned in the best order. The ewes were stocked, during the succeeding summer, at the rate of ten per acre, and left the land in good store state. Their lambs also were summered on the same land, at more than twelve per acre, and although kept hard during winter, the wedders fattened to 16lb. per quarter, from which to 20lb. per quarter, is indubitably the most advantageous size for the public, and in strong probability, for the breeder and grazier likewise. I have since been assured, from undoubted authority, that from 221 acres of pastures, vetches, and turnip land, being the whole of the land over which the sheep run, last year, the profit of a flock of this breed amounted to £1592. 9s. 2d.: but working oxen and other horned cattle ran over the same land, for which must be deducted 31 acres, so that there remain but 190 acres chargeable to the sheep, making a return of £7. 4s. per acre, in the most disadvantageous season, on account of the drought, which has occurred for many years. In general, land worth a guinea and half per acre, will carry and keep in good store state, six and a half Spanish Ryelands, and from four to four and a half, Spanish South Downs, allowing turnips, pease-haulm, or the like, in the dead winter months. The largest breed of South Downs are stocked in Sussex at the rate of four per acre.

Of pure Merinos, an acre of land will carry a proportionally greater number. They have been found

very apt to take on both flesh and fat : for two ewes of this breed, exhibited at Bath, fifty guineas were offered and refused. The pure Spanish fleeces have not been sold for less than one guinea each, the average weight being upwards of 6lbs. in the yolk ; after this rate, ten guineas per acre might be made, including the expence of a quantity of roots or hay for winter keep. Lord Somerville repeats his recommendation of SALT, to be mixed with good, as well as damaged hay ; of its great use, in the latter case, I have known various instances ; being sprinkled after the rate of from 12 to 35lb. to a load. Heated and moulded hay has been thus rendered more agreeable to the palates of cattle than even the finest, and has improved them in an equal degree.

Dr. Parry's ' Facts and Observations, tending to shew the practicability and advantage of producing in the British Isles, clothing wool equal to that of Spain, with hints towards the management of fine-woolled sheep,' evince great personal and experimental attention through a course of years, and a profound knowledge of the subject. The book will be resorted to by all those who undertake the improvement of their wool. Dr. Parry was among our earliest experimentors with the Spanish cross, beginning upon a small scale, in the year 1792 ; for some years past, however, he has annually sheared a flock of several hundred sheep, chiefly the produce of Ryeland ewes and Spanish rams. In 1800, when his book was published, those individuals which were forwardest in improvement, had five generations, or crosses, of the Spanish blood : by this period, doubtless, Dr. Parry's breed must have received all the benefit, in respect of fineness of wool, that can result from the Spanish cross simply considered, and should any farther advance be held necessary, they must now possess the

power of effecting it by intercopulations within themselves, in the ordinary course, that is by the selection of males and females which excel in the required properties.

Spanish sheep, says this learned yet practical shepherd, are entirely enveloped in wool, which grows under the jaws, down the forehead to the eyes, under the belly, and down the legs to the very feet. It is astonishing to see how thickly it covers the skin. It will scarcely give way to even pressure of the hand, but yields, as it were, by starts, like the close, short hair of an extremely fine clothes-brush. In washing them, the water penetrates to the skin with great difficulty. The fleece is heavier in proportion to the carcase, than that of any other known breed in Europe. In the raw state (unwashed on the sheep's back or afterwards) the fleeces of the two year old ewes average at $4\frac{1}{2}$ lb. avoirdupoise, and the weight of the living ewe being about 60 lb. the proportion of wool to that of carcase is about one to twelve and a half. The fleece of a fat wedder of the same age will be from 5 to 7 lb. In eight shearling rams, weighed alive, after having been clipped, the weight of the fleece to that of the living animal, was as one to about twelve and three quarters. The wool from the head and behind the ears, and the rest of the refuse, generally called daglocks, had been previously taken away. Had these sheep been washed before shearing, their fleeces would have lost about a ninth part.

The length of the staple or filaments varies. In a shearling ram, shorn when a lamb, a sample of the wool cut close to the skin above the shoulder, is three inches and half in length; and that of the breech or middle of the back part of the thigh, three inches and three quarters: of an ewe of the same age, about one quarter of an inch shorter; the average according

very exactly with the specimens taken from newly-imported Spanish sheep. An instance of the extraordinary length of staple, of four inches and three quarters, is related, which from the scoured fleece produced a sample more than five inches long. The proportion of fine wool in the fleeces of the Spanish sheep is much greater than those of any pure English breed. Thus, while in the Ryeland, which is probably divided into four or five sorts, the finest wool from the neck and shoulder does not make above one eighth part of the whole fleece, in that of the King's flock (as has been stated) the fine wool formed near four fifths of the whole. Of Dr. Parry's wool, consisting of whole fleeces taken from sheep, which had not more than three or four crosses of the Spaniard, and divided into three sorts, (R. F. T.) according to the Spanish method, 155½lbs. produced of R. or *Rafinos* (superfine) 104lbs., more than two thirds of the whole. The uniformity of fineness in the improved wool is such, that in showing specimens from these different parts of the same animal (the shoulder and the breech) which are generally considered as producing the best and the worst wool, Dr. Parry never met with three persons who could agree which was the finest, and many good judges actually decided in favour of the latter. This wool contains a great deal of *yolk*, or oil, which is apt to entangle the dust of the fields, so as often to form a kind of mat of nearly an inch in thickness; it is remarkably, or rather wholly free from *stitchell*, hairs or *kemps*. *Brownness* in the wool of any particular sheep is an indication of superior fineness. (Such was the colour of the ancient fine-woolled sheep, and we need not look for the cause in any peculiar quality of soil or composition mixed with the wool) it will nevertheless scour white.

No particular care is taken of Dr. Parry's sheep,

nor are they housed during winter, excepting the ewes, two or three nights after lambing, if the weather be severe. The land on which they are fed is inclosed, and the grass upon half of it, coarse and rich. Their extra food, wild endive, cabbage, hay, and ground oil-cake. *Far from this gross food having the ill effect of rendering the wool coarse, rough, and intractable, according to the theoretic ideas of the manufacturers, promulgated in a certain weak publication, it continued peculiarly fine, smooth, and yielding; possessing all the qualities of the best wool from Spain, not only in the Doctor's own opinion, but in that of the best informed manufacturers.* Dr. Parry challenges, with a bet, his wool against the finest imported Spanish, and even offers to take odds, that he produces *finer* than any such imported wool. The cloth to which the premium was adjudged by the Bath Society, was manufactured from Dr. Parry's wool, and that not of the finest; it was, however, deemed worth 19 or 20s. per yard, and three or four shillings per yard more than cloth made of Ryeland wool. The wethers of this breed, when tolerably fat, will weigh from 12 to 15lb. per quarter; the ewes from 10 to 12lb. They are healthy, tractable, and docile, and partake so much of the character of their Spanish sires, as to be more patient under confinement than the Ryelands. Free from the rot, scab, or any other general disorder, able to live hard, and endure the inclemency of the seasons; indeed Dr. Parry remarks, their fleeces are so extremely close, and full of oil, as to afford the best security against rain, snow, frost, or wind. From the difficulty of washing these close, oily fleeces, on the sheep's back's, and on the consideration, that wool keeps best in the yolk, and is more advantageously scoured by the manufacturer, it seems preferable with the improved breed, to decline washing altogether.

The most profitable time, at which to fatten this breed of sheep, is, in Dr. Parry's opinion, taking wool and carcass together, when they are six toothed, or three years old. An observation follows, which from its consequence, in the winter season particularly, I have often wondered should have escaped the writers on sheep—"they are the most in-*œ*conomical of all animals," treading under foot and wasting, at least, one third of their provisions. Hay should be cut into chaff for them, and given in troughs, and all kinds of food dispensed in small quantities at once, and so divided, that the sheep may not be disposed to contend for it, or stand in each other's way.

Dr. Parry did not experience his usual success in breeding from the Morf ewes, and has thence determined to discard all black-faced or black-legged ewes from his breeding flock. The skin of the Spanish breed (a fact particularly insisted on by Lord Somerville) is of a peculiarly red colour, and this state of the complexion Dr. Parry supposes connected with that of the fleece, as the colour of the hair is with that of the complexion in the human species. Mr. Whitaker, of Bath, formerly a woollen manufacturer, is fully convinced of the practicability of equalling Spanish wool in England. He has for several years tried the Spanish cross with the Wiltshire breed, nearly trebling the wool in quantity, and improving it extremely in quality; the carcasses are reduced in size, but improved in mould, and the disposition to fatten increased. Breeders are very properly cautioned not to flatter themselves with the expectation of rivalling Spanish wool, with one or two crosses of the Spanish ram on our English breeds, although they may, by proceeding so far, greatly improve both the quantity and quality of their wool: in order to produce a fleece of real fine wool, it is absolutely necessary

that the sheep have *at least* five sixths of Spanish blood.

According to Lord Sheffield, a nobleman of long and mature experience on both rural and commercial affairs, the wool of the Spanish breed which had been nineteen years from Spain, and two years in his park in Sussex, retained its quality so well, that it appeared as perfect, as the generality of samples he had seen from Spain.

A late memoir of George Tollet, Esq. (Ann. Agricult. No. 243.) fully confirms, from the experience of that gentleman, the vast advantages, actual and prospective, of the Spanish cross. The account is truly important, touches all the material points, and does infinite credit to the author for the skill and judgment with which he has commenced his plan of improvement. Mr. Tollet purchased of Lord Somerville a score of Spanish ewes, and his Merino flock consisted on the shearing day, of 25 ewes and 2 rams, together with 19 shearlings, half Spanish and half Ryeland, 7 shearlings half Spanish and half South Down, and 4 shearling rams of the same mixed breeds. The average weight of each Spanish fleece in the grease was 5lb. 13oz. The lightest ewe fleece weighed 3lb. 4oz. and the heaviest ram fleece 11lb. 12oz. of very good quality. This ram was not quite thirteen months old at shear-day, and was adjudged to weigh 20lb. per quarter. Mr. Tollet declined the offer of two hundred guineas for him, as also that of one hundred guineas for the use of him, during the tupping season: Mr. Tollet does not wash his Merino sheep before shearing, since, from the closeness of the fleece, it is not much liable to the intrusion of dirt: as it does not lose quite half its weight in scouring by the manufacturer, an estimate may be made after that rate of the value of a fleece in the yolk.

The fleece of the young ram just mentioned, may be, most truly, pronounced a golden fleece; it produced upwards of thirty-five shillings: the average produce of the whole unwashed Merino wool 18s. 9d. each fleece. Price of the superfine, more than four fifths of the whole, 6s. 3d. and 6s. per lb. Of the third sort, or *fribs*, but about 1lb. in the whole.

The half bred sheep had been shorn when lambs, and were washed before shearing, in the usual way. Of the Spanish South Down, first cross, the heaviest fleece weighed 4lb. The heaviest ram fleece of do. 5lb. 3oz., the fleece of the mother of this shearling ram weighed 2lb. 7oz. Of the Spanish-Ryeland, first cross, the heaviest fleece weighed 4lb. 1oz. The heaviest ram fleece 4lb. 5oz. Average weight of the two, 3lb. 6oz. each fleece. Price of the first sort of Spanish-Ryeland wool 4s. 2d. per lb.; of the second 3s. Price of the first sort of Spanish South Down 3s. 10d. per lb.; of the second sort 2s. 8d. Average value of this improved wool of the first cross 11s. 6d. each fleece, or upwards of 150 per cent. advance on the value of wool, from one cross only.

The following opinions of Mr. Tollet on this subject merit great attention from every sheep farmer. He judges that an acre of land, which will keep three South Down sheep, would be sufficient to keep four Merinos. The produce in wool of the South Downs would be 13s. 6d. per acre, that of the Merinos £3. 15s. 6d. That our climate is better calculated for the growth of superfine wool than that of Spain; in consequence, wool would be more likely to improve, than degenerate, in this country, and the carcase likewise, that in process of time, we shall be able to produce as much mutton per acre, from the Spanish, as from any of our native breeds. That the Ryeland and South Down are the most proper breeds to put

to the Spanish ram. Mr. Tollet expects to have forty Merino ewes to put to the ram next year, and in ten years, to be able to complete this important experiment.

Various memoirs of Mr. Bartley, in the Agricultural Magazine and elsewhere, serve to confirm, from his experience, the facts already stated. Mr. Bartley gives an account of four Merino wedders which produced the extraordinary quantity of $35\frac{3}{4}$ lb. wool; of several individual ewes which produced 8 lb. each, and of a wedder which gave $10\frac{1}{2}$ lb. He thinks the displacing of one twentieth part of our sheep, would be more than sufficient for the purpose of a full supply of fine wool. That four crosses with the Spanish ram, in and in, would be sufficient for every practical purpose, even for the finest fabrics, which might be completed in six or eight years. In the Agricultural Magazine, No. LIV. p. 40, he gives a curious prospectus of the gradational increase of value in the wool, until it reach the supposed maximum, in the fifth cross.

Mr. White Parsons, of Somersetshire, made use of Dorset ewes, in the Spanish cross, and obtained a breed bearing 6 lb. of wool, weight of carcase 20 lb. a quarter. The following particulars relative to the success of the Spanish cross in NEW SOUTH WALES (Botany Bay) are extracted from the statement of Captain M^cArthur, delivered at the office of the Right Hon. Lord Hobart, Secretary of State, in July 1803.

“ The climate of New South Wales is peculiarly adapted to the increase of fine-woolled sheep, and from the unlimited extent of the luxuriant pastures, millions of them might be raised in a few years at a small expense. Specimens of the wool of that country have been approved by the best judges of wool in this kingdom, as having a softness superior to many

of the wools of Spain, and as equal, in every valuable property, to the very best to be obtained from thence. The sheep are of the Spanish kind, sent originally from Holland to the Cape of Good Hope, and from thence to Port Jackson. The wool has improved progressively since 1797, the year in which the sheep were introduced. In 1801 the heaviest fleece weighed $3\frac{1}{2}$ lb., in the following year, the weight of the fleece was increased to 5 lb. each, and improved in fineness. A fleece of one of the original sheep from the Cape, has been valued here at 4s. 6d. per lb. one of the same kind, bred in New South Wales, at 6s. per lb. Captain M'Arthur exhibited the fleece of a coarse-woolled ewe, which was valued at 9d. per lb. and the fleece of her lamb by a Spanish ram, which was allowed to be worth 3s. per lb.

“ Captain M'Arthur has now nearly 6000 sheep breeding from Spanish rams, and calculates they will double themselves every two years and half; and that in twenty years, they will be so increased as to produce as much fine wool, as is now imported from Spain and other countries, at an annual expense of one million eight hundred thousand pounds sterling. It is yet not expected, that the sheep will multiply in the same ratio, as at the commencement, since the Spanish sheep are not so prolific as the common kind, seldom bringing double lambs. By the returns from New South Wales, 1531 formed the amount of the public and private stock in 1796, since when not one hundred sheep have been imported thither. In 1801 the number returned was 6757, and although between these periods, all the males (wedders) have been killed as soon as fit, yet a surplus remained over the calculation of 633. It is ascertained that the freight and all charges upon the import of wool from New South Wales, will amount to 3d. per lb.”

Of the complete success of the attempt to grow fine clothing wool in Britain, and various other countries, equal to that of Spain, I trust I have exhibited proofs abundant, and as entirely satisfactory to the reader's conviction, as to my own, which, however, has been strengthened by ocular demonstration.

It now remains to speak of another most material part of the question, which is, whether by introducing Spanish sheep, we do not lose as much in mutton, as we gain in wool; and although what is said on this part must necessarily be somewhat more speculative than the other, in the present early period of our attempts, I have yet, from what I have already witnessed, and from the best judgment I am able to form by analogy, the utmost confidence that our success with respect to carcase, will, in regular progress, be equal to that which we have experienced in wool, and I entertain little doubt of being joined in this sentiment by all my intelligent and unbiassed farming readers.

The causes of failure, in various individuals, who formerly relinquished their experiments with the Spanish tup, I apprehend to be these: they were not apprized of, or did not attend to the fact, that in proportion to the small size of the stock, an increase must be made in the number, in order to equalize mutton per acre, whence their complaints that they could not sacrifice every other consideration to that of wool; for in regard to mere local prejudices, concerning form, granting an equal quality of meat, weight will always knock down such arguments, and it can matter little to the feeder, unless as far as it is in his favour, whether his eight and twenty stone of mutton be the produce of four sheep, or three, provided the same quantity of keep has fattened each. Without recurring to the abstract question of size,

on which I have so often expressed the uncertainty under which my mind labours, there is no speaking against those plain facts which have been adduced. In the case of a breeding flock, with a certain breadth of ground allotted for the maintenance of them, and their produce, I apprehend, the right proceeding on the introduction of Spanish rams, is to increase, at the same time, the number of ewes, in contemplation of the diminished size of their lambs. By such means are to be obtained equal weight of lamb or mutton per acre, as from the former breed, with the bonus of an advanced price per lb. on account of smaller size, and of improvement in quantity and quality of wool. A want of perseverance also has, doubtless, been the cause of many of these miscarriages; every man is not endowed with the ardor and capacity of a Bakewell, who could spend forty years of his life in constant pursuit, until the completion of his schemes of improvement.

Mr. Bartley very properly remarks somewhere, that the first cross is the most advantageous to the farmer; doubtless it is to obtain a great advantage in a single season, by simply changing the ram, and a Spanish ram may be purchased from the Royal flock at a moderate price; and Lord Somerville has removed one great stumbling block, by ascertaining the market value of Anglo-Spanish wool, in which public service, Mr. Tollet has improved upon the original, by making a greater price for the commodity, than was ever before heard of, namely 4*s.* 2*d.* per lb. But if the advantage of the first cross be easily attained, we must allow, that to perfect the experiment, and to produce superfine wool, is a work requiring considerable time, and if to this we join the improvement of the carcase, no less attention, judgment, and perseverance. Do not planting, fencing, draining, all

our country improvements, necessarily imply time, attention, labour, and expense? but in the due completion of judicious plans, all these are repaid with compound interest; man is advantageously employed, which is to say all.

Let us take a view, from an abbreviated sketch, of the number of years necessary (no time being lost) to arrive at the fourth cross of the Spanish upon any of our English kindred stocks, by which we are to suppose the object of superfine wool will be fully attained. The ewes are supposed put to the ram in autumn, the lambs, in course, to be dropped in the spring; the young ewes to go to the ram the second autumn, or at about nineteen months old. They who have an objection to breeding entirely in and in, may put the young ewes, to any other full-bred Spanish ram, instead of their own sire. The crosses to be carefully marked, 1, 2, 3, &c. and a regular breeding book kept.

PROSPECTUS OF SPANISH CROSS.

Autumn 1804 ewes to ram.....	Spring 1805 lambs 1st cross dropped.
Autumn 1806 do. 1st cross to ram...	Spring 1807 do.....2d ditto.
Autumn 1808 do. 2d.....ditto.....	Spring 1809 do.....3d ditto.
Autumn 1810 do. 3d.....ditto.....	Spring 1811 do.....4th ditto.
Summer 1812 fourth cross or full-bred British Merinos SHEARED.	

In the common mode of reasoning *ad indolentiam*, it may seem a long time to wait eight years, for the attainment of our object, and such is the light in which people generally consider breeding. But to observe this in another, and better point of view, delay is almost out of question, since, throughout this whole plan, we are annually breeding, and growing lamb, mutton, and wool, with the advantage of an additional and capital object at a certain definite period. The fourth cross in sheep (the reader will not expect the business of the stud to be out of my head)

answers to the produce, in horses, of a seven eighth bred mare, by a thorough bred English racer, Arabian or Barb, which produce ought to race, although such a thing would be looked upon with suspicion at Newmarket: I have yet been thoroughly convinced of many dips of bastard blood in our best racing breeds.

Should the fourth cross manifest any deficiency, either as to fineness, thickness, or weight of wool, which last item will generally determine the former two, the only remedy is another dip from the best bred Spaniard to be procured, and then I apprehend nothing farther is to be expected in this way. At this period, the fourth or fifth cross, it is, that British Merino tups are to be selected, of the largest size, best form, and most thickly covered with wool; nor do I think there is much utility, probably it may be generally disadvantageous, to make use of tups of the early crosses; it does but lead to inefficient and half measures. It may not be amiss to mention here, as mere matter of curiosity, the general prejudice, so I take it to be, that in *the production of like*, all, or most depends on the ram, or male. This deception has arisen from the necessity there is, of making use of the male in changing a breed, for another reason, namely, that he can serve such a number of females. It is probably always fortuitous, whether the produce of a copulation most resemble, in form or quality, the male or the female.

The topic of home-bred Merino rams, leads us to consider the best adapted of our short-woolled stocks for the Spanish engraftment. The opinions and practice of Lord Somerville and Dr. Parry have brought the Ryelands, almost exclusively, into fashion, for this purpose; but there is one consideration which seems to point to other breeds, that is, the general fondness

for larger stock, for something to fill the eye. In this view, the Dorset are perhaps the most eligible, as they have been found to produce the largest half-breds from the Spanish ram: should this be rather behind the Ryeland cross, in respect to fineness of wool, an additional dip of the Spaniard would probably level them, in that respect. Our best adapted breeds are the Ryeland, South Down, Mendip, Dorset, Cheviot, all unexceptionable; with the smaller varieties, Cannock Heath, Morf, Forest, Welch, Dunfaced, and the Wiltshire, Berkshire, and Norfolk, granting it be worth while to retain those breeds.

The mild and docile character of the Spanish sheep will be an excellent corrector of the wildness of our Welsh and Heath sheep. In the synopsis, I observe, I have described the Berkshire Natts as a long woolled sheep, which happened, I believe, from my taking as a specimen, certain tups, which might have been crossed with the Oxfordshire polled sheep: in general, the Berkshires are a mixture of the down and long woolled breeds bearing a middle woolled fleece.

I freely acknowledge, I have seen half bred of the Merino cross, of that puny, thin loined form, which all judges of stock are well apprized, it is so difficult to make fat, and among which there are ever so many casualties. We have in truth, amongst our native breeds, plenty of this rabbit-like sort, which from needing the same length of time to arrive at their best, with large animals, and even then being deficient in proof, will never, even by virtue of number, stand in competition with sized and good stock. The carcasses of these, whether British or Merino, must be improved, before they can become profitable. Nor ought this difficulty to startle us, or impede our course, since if the finger of a statue of Bakewell does not point to us the road to certain improvement, the form

of his improved animals does. If, at first of all, some small sacrifice of profit must be made, in regard of mutton per acre (which however will not happen but with our worst breeds) it will be well repaid, if not immediately, yet ultimately, in the article of wool, and by the time that the article of fine wool, from its plenty shall have suffered the natural decline in price, it may be presumed the carcass will have received a countervailing share of improvement. An export of wool, and an increase of mutton to feed our increasing mouths, we may fairly hope, will be the result of these measures.

Of the superior advantage of thorough shaped, small sized stock, particularly sheep, invariable experience permits us not to doubt. To enlarge size and confer *mould*, nature has left us no want, but of care and skill: she is so kind as to do the first business for us gratuitously, for we find that the progeny of all foreign cattle increases in bulk, in this country, which, to a certain degree, is to improve in form. We see the half-breds of the Spanish cross larger than their dams, and although from breeding by a small ram, we might expect he would impart his smallness of size, as well as fineness of fleece, yet our food and climate powerfully counteract that tendency, and we find, that we can, by good care and keep, increase the carcass to any needful size, and yet preserve the standard fineness of the wool. It was Mr. Davis, I think, of Wiltshire, who furnished us with the very apt and striking simile, that, "warmth and shelter are as necessary to produce perfect symmetry in the parts of an animal, as to unfold the wings of a butterfly, or expand the petals of a carnation." Regular good keep, from the first conception in the mother's womb, and ever after, particularly in the winter season, will increase size to the utmost that can be desired; an

attention to width of loin and chest, will confer the property of taking on fat, together with the most important one of a sound constitution. English Merino tups may be thus improved to any size, and a fair field now offers to the ambition of those enterprising tup-breeders, who are emulous of rivalling Bakewell in a fine woolled cross, in producing *Dishley* Merino tups.

But we have not taken it for granted, for we have yet no right so to do, that Anglo-Spanish mixed wool, even of the fifth cross, will entirely equal, in fineness, the pure Spanish grown here: it may, perhaps, take half a century to level them; nevertheless our improved wool may, and doubtless will, from what we have already seen, approach so near, as to be fully equal to every practical purpose. I am decidedly of Mr. Tollet's opinion, as to the probability, that the pure Spanish wool will improve here, not only in quantity, but in fineness and softness, with perhaps, in some situations, a loss in point of elasticity. The improvement is at length in such judicious and attentive hands, that there is no doubt but the race of Spanish sheep at present in the country, will be preserved pure and unmixed; they are as yet, and likely long to be, too dear and precious for mutton, and may be well improved before they come into competition with our native breeds for that purpose.

From want of data, there is no forming any guess, as to the length of time which it will take, to produce a stock of fine wool adequate to the demand of our fabrics, and to set us clear of dependance on a foreign supply. We might, however, in the course of ten years, raise a sufficient number of high bred fine woolled tups, for the whole of our flocks. Whilst the grand national object is necessarily deferred, individual

undertakers will be profiting greatly. There is this harmony in all good schemes.

In regard to the quantity of fine wool necessary to be superadded to our growth, in bar of importation, let us take it *pro forma*, at five millions of pounds; this we must raise by an increase in our breed of sheep, if the demand for mutton will allow it, if not, by simply crossing with Merino tups, several millions of our short woolled sheep, the weight of fleece in which, will, in most, be more than doubled by the measure, since the average weight of their fleece is at present barely $1\frac{3}{4}$ lb., at the average price of perhaps 1s. 3d. Nor can I allow that we shall lose as to quantity of mutton per acre, for reasons already assigned. Many of our slow feeding breeds would be amended, in that respect, by the Spanish cross. With the cross in our best breeds it has been proved, that we lose nothing in mutton, but gain abundantly in wool.

The produce of Spanish rams, it may be urged, will be too tender for our exposed northern districts, and will, at least, require good winter keep, and perhaps cotting. If so, in my opinion, it is one of their best recommendations, and were these tender sheep adopted, they might help to supersede that system of infatuation or rather insanity, which has for its common results—“*Ewes so weak for want of food, that they cannot bring forth, and those which can have no milk, and dying by hundreds.*” But Sweden is a more rigorous clime than Scotland, and the dun-faced sheep of Scotland were originally Spanish, and the race horses of Scotland were originally Arabian. No other fleece that we know of, is so well calculated to defend the carcase from cold or wet, as that of the Spanish sheep, the wool being so extremely thick sown upon every part of the skin, covering the very face and legs; its closeness indeed is such, as to entangle and

retard the escape of the perspired matter, whence so great a quantity of yolk or grease in Spanish wool, and its substantial external defence. Animals covered like these, and once inured to the climate, or rendered *home-bred*, must surely be superior in point even of hardiness, to those bearing long, open, or thin fleeces. It must yet be acknowledged, that all fine woolled sheep, notwithstanding the subsequent thickness of their fleece, are lambed almost naked, and consequently tender during their very early days, whence the necessity to afford them that shelter by which, in truth, all new-born animals are benefited. I understand it is acknowledged in some parts of Scotland, that from the coting and superior winter care of former days, there was a superiority of fineness in the wool, which subsequent exposure has deteriorated.

How far the improvement and increase of our clothing, may probably affect the growth of our LONG WOOLS, has become a question; it is, however, in my conception, one of the illegitimate and irrelevant class: in all great and necessary measures, there are points which must inevitably be left to shift for themselves. Should a fashionable rage for the growth of fine wool occasion us to neglect the long species, the consequent scarceness and high price of the latter would, in due time, operate as a cure of the evil. These ebbs and flows and irregularities compose an integral part of the nature of things, and are therefore without remedy, but at a losing price, notwithstanding the painful and perpetual endeavours of our parchment balance-masters. It has been said, we had better increase the breed of long woolled sheep, and import our fine wools, a plan which has been indeed too much acted upon hitherto, to our countless national loss. The growth of fine wool has been discouraged in every possible way. Upon wastes, formerly, and even at

this moment, so extensive upon our island, which in regard to sheep husbandry, may be said to produce little else but wool, fine could not be grown hitherto, because coarse only was in demand, and the sheep owners, from a profound respect to the patriotic importers of Spanish wool, have contented themselves with a fleece of a pound and half, worth perhaps about ten pence per lb. On improvement of the land, long woolled tups have been almost invariably introduced, out of complaisance to the following axioms which were supposed self evident: "that attention to fine wool must always diminish in proportion as carcase becomes valuable, and that it is impossible to improve both wool and carcase, or to produce mutton and wool in equal ratio." The degree of right such opinions have to be dignified with the title of axioms, will be visible to the discerning reader. They have, however, prevailed, and the consequence has been the introduction, frequently, of a stock disadvantageously large, of an unfavourable mixture of wools, or of long wool, in districts the best adapted to the production of fine. Doubtless fashionable prejudices, want of due information on the question of size, and an equal want of good fine woolled tups, are circumstances to be pleaded in this case. It belongs to our Merino tup-breeders to put an end to this difficulty, and to confine the long woolled breeds to their proper districts.

On what foundation does the opinion rest, that rich soils and marshes cannot be advantageously sheep-stocked, but with the large and long woolled breeds? On that of practice or custom, which may be either right or wrong, for any thing hitherto proved to the contrary, by fair experiment. I must acknowledge, I have ever been a partaker of the prejudice in favour of large stock, but I have exceptions in my mind, and should be glad to be informed of the result of some

such experiment as the following:—Twenty Cotswold, Warwick, or New Lincoln, (by Dishley tups) two year old wedders, of the average size, against the same store weight of Spanish South Downs (first cross) of like age, each lot to be wintered together in the usual way, and in the spring to be turned into the richest marsh keep, and slaughtered at the end of five months.

In an experiment like this, no mode can be fairer, or more likely to demonstrate to us, the desired results, than to place on measured portions of grass, equal in goodness, either the same living weight of sheep, in each lot, or even the same store weight determined by capable judges. To make up the store weight of 20 large sheep, would be required, we will suppose, 30 of the small, and we may again suppose, within the line of probability, that the average weight of the large, when fat, would be 11 stone, or 220 stone the 20 sheep: the average of the small, when fat, 7 stone 4lbs. or 225 stone the 30 sheep. The small mutton would be sold at market for full 4*d.* per stone more than the large. The wool of the 20 large sheep, at 9lb. the fleece, or 180lb. at 1*s.* 6*d.* per lb. would amount to £13. 10*s.* The wool of 30 small sheep, 4lb. the fleece, or 120lb. at 3*s.* 6*d.* per lb. would amount to £21. Should 30 small sheep consume more grass than the 20 large, in course, the surplus would be charged to their account; on the contrary, some assert, that as it is probable, 32 small sheep would be required, in this experiment, to make up the store weight of the 20 large, even in that case, the former would not require more food than the latter. Experiment would clearly decide this important point. Again, in great probability, the small sheep might make an average of 8 stone of mutton. If of the large species, still larger individuals should be

chosen, as for example, a score which would average at 15 stone of mutton, a greater number in proportion of the small stock would be required to complete the store weight. For curiosity sake, let us speculate on the result of a similar experiment, the small sheep being pure Spanish. More than 35 of these would be required to make the store weight, but say 35, which being fat, would, at 6 stone 4lb. each, make a total weight of $227\frac{1}{2}$ stone, worth more per lb. in the market, than any mutton we have in this country. The wool, at the present price, might fairly be reckoned to fetch near, or altogether £35. These *paper* results are extraordinary, but the sequel is still more so: even handed, twenty against twenty, the Spaniards at 6 stone 4lb. wool at the present rate, will equal, within a few odd pounds, the value of the large sheep, at 11 stone each. By improving the pure Spaniards *secundum artem*, we shall obtain a heavier carcase and more wool, from the same quantity of food.

Should the fine woolled, or small sheep, stand but upon a level of profit with the large, in this experiment, it would establish a most important and incontestible superiority in their favour, by proving them adapted to all situations, whereas their competitors, the large, can be fit only for rich and luxuriant keep. It would demonstrate that an error has often been committed, by introducing large, long woolled tups, when an improvement of the original small stock, and an increase of the number kept apportioned to the amelioration of the soil, would be consistent with its nature, and more advantageous. Experience has taught, that rich pastures greatly augment the bulk of the fine woolled fleece, now if an equal weight of fine, as of coarse wool, per acre, can be gained, (no improbable speculation) the instant advantage is ob-

vious, and it may give rise to prospective views of manufacture, of the utmost national consequence. It has been demanded, as a question of curiosity,—what purpose is there to which long wool is applied, which would not be better answered by the use of carding wool? Of the merits of this question I profess to be no judge, but make myself perfectly easy, that if coarse, long wool, be really an article of necessity, it will be grown; and that if fine wool turn out, on fair experiment, to be preferable, it will be substituted: nor do I doubt, that long fine wool is attainable. Bakewell found his account in giving his new breed a dip or two of fine woolled blood, and not improbably, a single cross of the Spaniard, might be of use to some of our coarse, long woolled breeds, in order to give them a thicker covering, a finer filament of wool, finer bone, and finer grained mutton.

HIS MAJESTY'S MERINO FLOCK.—Sir Joseph Banks has lately published, in the *Annals of Agriculture*, a farther report of the Windsor flock, (to Michaelmas 1803) from whence we have the following interesting particulars:—Number of the ewes 96. Product of wool much as usual. Price of R. ewe wool 6*s.* 9*d.* per lb. of the ram wool 6*s.* 6*d.* the rise occasioned by the scarcity of imported Spanish; a fresh hint of the importance of obtaining a home supply. The prime wool was purchased by John Maitland, Esq. M. P. a large importer of Spanish wool, at the same time a zealous advocate for the improvement of our own. The cloth manufactured from this wool by Mr. Edridge, proved excellent, and the King was pleased personally to consult those gentlemen on the subject. The opinion seems to hold, that this wool has improved since the sheep were imported, and that it will yet improve, nor has there been any succeeding importation which might affect its quality. The shape and

weight of this year's shearling rams are also improved. No purchasers having been found for the lamb's wool, at an adequate price, it was manufactured into light ladies cloth, which proves excellent, and promises to be a valuable article; it is supposed, however, that a more profitable application still of the lambs wool, would be the manufacture of superfine hose. On the request of the Bath Society, His Majesty presented them with a Spanish ram last autumn. The demand for his Majesty's sheep has had a very great increase, and as the sale of them below their real value, might be injurious to the interests of those concerned in the expensive scheme of improvement, such rams and ewes as can be spared from the Royal flock, are, in future, to be annually sold by auction in Kew Lane.

On the 15th of August, 1804, I attended the first sale by auction, of HIS MAJESTY'S SPANISH RAMS AND EWES. It was held in a paddock at Kew, and Sir Joseph Banks was present. The numbers sold were 24 shearling rams, which produced the sum of £402. 9s.—Seven full-mouthed and four-toothed rams £171. 13s. 6d.—Fourteen ewes £118. 8s. amounting in all, for the 45 sheep, to £692. 10s. 6d. The highest price of the shearlings was 42 guineas, the lowest £6. 7s.—Of the full-mouthed rams 38 guineas was the highest, and 7 one half the lowest price. Of the ewes 11 guineas the highest, 6 the lowest.—The rams were put up at 6 guineas, the ewes at 2—the former prices at which they were allowed. Next year a larger number of ewes are intended for sale. The wool has been sold this year unscoured, at 4s. 6d. per lb.

The size of the EWES, somewhat under our *pure* Ryelands, but above several of our small breeds; heads sharp and well shaped, with, occasionally, a black spot or two, wool externally, having a dirty tinge, but without that red-brown hue, which has been

before mentioned; ears pendulous; perfect ewe-neck, with the sinking or cavity, both before, and behind the shoulder, the top of which is generally higher than the rump; capacious belly, the animal standing wide and well upon the legs. The RAMS generally of good size, some of them large enough for any purpose whatever, and of great bone, but flat and symmetrical: several of them were of as good and useful form as need be seen, having compact, good loins and shoulders, and straight backs. Two or three individuals resembled very strikingly, our Dorset and Hampshire stock. The characteristic velvet or silken gloss on the shorn faces of the rams, was remarkable, and their countenance put one in mind of the fair haired human complexion. Mouths by no means fine. The rams were in better case than the ewes, which were very low in flesh, and it was remarked by a dealer present, that in a country market and unknown, they would scarcely have fetched five shillings a head. Some of them were blind, from cold caught in the winter and spring, a circumstance in itself sufficient to demand shelter for them throughout those periods, yet a Scottish gentleman present averred, that he had a Spanish ram which was exposed, throughout the whole winter, in his country, with no ill effect whatever: a breeder exposes his Spanish stock in the same way, in Essex, even during the snows; but on this, Captain M^rArthur very rationally observed, that a few solitary instances were an insufficient foundation for general reasoning. The Captain houses his immense flock, during winter, 300 in a lot. A farmer present observed, that his Spanish rams were equally hardy with his South Downs, that he kept them together in the same pasture, and they maintained an equal condition. The wool of the rams exposed to sale, varied considerably, some individuals bearing a finer fleece than others.

Flock remains this year, 100 ewes, 5 rams, and 78 lambs, the produce of 90 ewes and 4 rams. The extraordinary rise of prices is the best proof that the competition was great, in fact, there were buyers actually present, or orders from the most distant parts of the island. Sir Joseph Banks purchased for Sir James Reddal in Scotland, and Sir Richard Worsley, in the Isle of Wight, where has been long an established and excellent breed of fine woolled sheep. Mr. Fanshaw, near Reigate, in Surrey, has a flock of some hundreds of half-bred Spanish sheep, and on enquiry I found, that the Spanish cross was far more widely diffused in this country than I had previously supposed.

The mugs. About thirty or forty years since, this singular breed of sheep prevailed throughout all the low lands of Northumberland. Short, coarse curled wool covered their heads, faces, and legs, and grew down to their toes: in form, they resembled hill sheep: their shoulders low and sharp, sides flat, back rather arched, loins thin. I cannot conjecture how sheep should become thus *mugged*, unless it resulted from some Spanish cross upon the country breed, in former days, the account of which is now lost. The mugs extended to Yorkshire, and traces of them are still visible, although they have long since given place to improved long woolled sheep.

The large TUFT OF WOOL covering the face of Merino sheep, is extremely inconvenient in northern countries, where they have frequent heavy drifts of snow. It is Lord Somerville's practice to clip this and the leg wool, two or three times a year, beginning about six weeks after shearing. Yet in winter, and in very rigorous climates, it may not be proper to leave the head too bare and exposed, the sheep being, at least according to the ancient opinions, one of the most tender-headed of all animals, and we know, by con-

stant experience, how liable they are to blights in their eyes, and temporary blindness, from the effects of cold and changeable weather. These clippings being reserved, are fit for inferior purposes, and the fleece is rendered more pure and valuable by their absence. The tuft on the head, and even the *throatiness*, or protuberance in the throat, characteristics of the Spaniard, are discoverable in degrees, in some of our native breeds, particularly the Ryeland, shewing their origin. Continental shepherds are solicitous to prevent the fodder from sticking in the fleece of the sheep, lest they should know off, and swallow the wool.

MARKS OF EXCELLENCE in long, or short woolled sheep. Fleece white (tinged with a red brown hue, if Merino) palate, with the bridge of the nose, horns and hoofs, white. No cats hairs. The horns wide set, otherwise the head liable to the danger of contraction. Yet wide-headed horned lambs are dangerous to the ewes in yeanning. It is said the horns may be with safety twisted off, when the lamb is only a month old.

SOUTH DOWNS. Mr. Alfrey says—(An. of Ag.) the number of ribs in these sheep, thirteen. Average weight of tallow 12 to 16lbs. exclusive of kidney fat. The finest woolled, fat, and fit for market, six weeks, or two months sooner than the coarsest, and in proportion to the fineness of the wool, they succeed each other. That the grain of the flesh is in proportion to the fineness of the wool, and that the carcass of a fine woolled sheep will considerably outweigh that of a coarser woolled sheep of equal size and dimensions; which indeed appears to me a very obvious truth. That if well kept, the ewes would produce more than one lamb, instances not being wanting of the production of five at a birth, but in such cases, more than

two are seldom saved. The coarsest woolled ewes bring lambs with the greatest quantity of wool upon them at the fall. A small degree of heat before the sheep is shorn has a surprizing effect on the taste of the flesh, which does not recover its usual flavour in less than three weeks or a month after the fleece is taken off.

According to Mr. Ellman, the breed of sheep in Sussex has increased full one quarter, within the last twenty years. Believes the sheep have increased generally throughout England and Scotland. Number of fleeces annually shorn in Sussex 200,000, lambs 120,000.

WOOL. By Mr. Ellman (An. Ag. 1803) wool, of the South Downs, increased in quantity, not improved in quality. Quality not injured by good keep. Closeness and firmness of the pile, marks of superiority. CATS HAIR—a long coarse hair that projects from the staple of the wool, and may always be seen by looking horizontally across the back, but not always looking down on the sheep. Very prejudicial, and frequently grows with a fine staple. Wool injured by the sheep being starved, which causes the pile to be knotty and rotten, and is discoverable by stretching the filament. When sheep are fed well till Christmas, and afterwards hard kept, but got up again in flesh before shearing, a common case, there will be a knot in the staple of the wool, which in working will prove brittle and harsh, and lessen the value considerably. Mr. Ellman introduces the very apt comparison of grass in a forward spring, followed by frost, the severe succeeded again by fine growing weather: from the check sustained by the grass, there will be found a knot in it, and the same is observable in timber. To produce good wool in any breed, it is necessary to keep them in a thriving state of flesh, and at no one period of

the year, to have the growth of the wool checked. Soil does not materially affect the quality of wool.

TAR SALVE—by Mr. Stow, a Yorkshire wool manufacturer. (An. Ag. 1803.) Effects of tar-salving very pernicious. It causes a very great waste of wool in *scribbling*: renders the wool far more difficult to work, both in spinning and weaving; produces a less number of yards from the weight of wool, and deteriorates the quality of the cloth. *Each stone of clean wool will make as many yards as 10½ salved. And a saving of a full eighth part of the whole quantity of wool grown in the northern districts, would be made, if the use of tar were dispensed with.* Salved wool requires a greater quantity of *wares* (logwood, &c.) than clean, and yet the colours always faint and dull. As the manufacture of cotton is rapidly extending, the improvement of the growth of wool, of the greatest consequence, &c. The reader is referred to the detail of Mr. Stow's letter, which is curious and important.

WASHING SHEEP. It has frequently appeared to me, on reflection, that it might be preferable to shear all kinds of sheep unwashed, and to wash them after shearing, when it would be so much more effectual, with respect to their health. Such as were affected with foulness or eruption on the skin, might be washed and scrubbed in a ley of water and wood ashes, in a large tub, which would contain three. It would both conduce to the health of the sheep, and promote the regular growth of the wool. As to frequent washing with soap, such measures are neither practicable with a flock of sheep, nor within the line of expence. Wool would probably keep best in the grease, and dust might be shaken from it. Any difficulty in respect to fixing the price of wool in an unwashed state, would vanish in a season or two. The only remedy with

which I am acquainted for the MOTH in stored wool, is frequent opening, shaking, and admission of air. I had hopes that certain aromatic or fœtid oils, would be a preventive, but cannot affirm it. The wool is of a bright glossy white, in proportion to the healthy and thriving state of the sheep.

SHEPHERDS are, in some places, very tenacious, refusing to turn their hands to any thing not deemed within their peculiar line of duty: in an inclosed farm, they should always have it in charge to mend or stop gaps in hedges, such accidents coming immediately within their notice. In an open or hill country particularly, the shepherd should have a light cart to carry bundles of hay, which are liable to be half blown away from a man's shoulders. Such carts have a hundred uses beside.

LEATHERN MOUTHED, OR HANTS SHEEP, AND FREE MARTINS. Leathern mouthed, or coarse and thick lipped animals, cannot bite close, and are long in getting fat. Lisle speaks of a sort called, in his time, *Hants* sheep, which never shed, but always retained their lamb's teeth, these were liable to be worn down earlier than the sheep's, on which account, it was necessary to fat such sheep early. There were hants-horses also, which always shewed by the mouth to be six years old. A FREE MARTIN EWE has a smaller and more lank bearing than breeding ewes, and carries a pissed tail; the urine dribbles from her, as does that of the male free-martin; the effluvia from both, as strong as from a goat. The defect appears to me to consist in mal-conformation of the parts, or obstruction, and brings to my remembrance, the case of a human free-martin, on whom, three or four and thirty years ago, *****, a surgeon in Suffolk, performed an operation much to the satisfaction of a dissap-

pointed husband; acquiring, besides his fee, a most appropriate sur-name.

If they must be starved, that is, **HARD KEPT**, a wether flock is better able to endure it than a flock of ewes. Being fed together (which is improper) wedders will drive the ewes, and seize the best of the food, whether abroad or at home.

A yellowish hue upon the **NEW-FALLEN LAMB**, a sign of good health, a green, or blackish cast, or pale white, the contrary. Cold and late **FOLDING** a great preventive of procreation and cause of barrenness in ewes. I know not why, but **South Down** ewes are said to drop their lambs more regularly together than any other breed.

On asking a nobleman in **Sussex** whether he grew **CARROTS** for his live stock, his Lordship replied, *he who has enough of grass has every thing*. An observation of great import. Good **HAY** will fatten wedders; grass and hay together still better. **White CLOVER** is more substantial than red. **RUTABAGA** should be sliced to prevent damage to the mouths of sheep and lambs.

A run in woods, where the damage of cropping the shoots is not regarded, affords excellent shelter to new-shorn sheep; if the season be dry, at that period, the wood-grass will be yet young and sweet.

HANDLING. Fattening points—brisket, mouse-piece upon the shoulders, fore flank below, channel or cleft of the rump, tut, or root of the tail, cod, dug. A fat wedder will sometimes lose 8lbs. weight on a **JOURNEY** of 50 miles, but more in proportion, on a longer drift. The loss on half-fat sheep is still more missed. I have said that the fat of **OIL-CAKE** fed meat has a disagreeable whiteness; as an exception, I have also seen it occasionally of a deep yellow. I am assured, by an eminent salesman, that cake fed animals

weigh beyond all others, that their flesh is to be preferred, as having the richest and finest flavour, and that corn-fed sheep do not weigh well, but even very indifferently. I must have some farther trials, before I subscribe to these opinions. On discoursing with this person, concerning the admission of ALDERNEY cows into the dairy, on the principle of *number in proportion to size*, he assured me, they would not graze after milking, and that their flesh was both of bad colour and bad flavour. An experiment is said to be in train, in France, with the LAMA, or Peruvian sheep; the ewe has brought forth once. On consulting persons in the trade, on the subject of MUTTON BACON, proposed to be made from large, over-fattened sheep, it was their opinion that mutton would lose too much in the drying, and, as salted provision, could never come into competition with pork, for solidity and weight, by consequence for cheapness.

Lord Bacon says, sheep breed as long as they live: according to Ellis, old ewes bring the finest lambs; and the general opinion is, that the Spanish sheep are the most long-lived. Nobody, however, commends very old mutton.

I cannot conceive, but that it must have required a far greater number of sheep than formerly calculated, to produce the annual quantity of wool stated p. 245, which, moreover, is a calculation made, perhaps, sixty or seventy years ago; late calculators have reduced the number, I believe, without reason, unless on the supposition, that the breed being generally enlarged in size, is concentrated in a smaller number; at any rate, no doubt can remain with those who are informed as to the state of the markets, that the consumption of mutton has wonderfully increased within the last ten years.

The following position is laid down in some Scottish

Report or Memoir.—*Coarse-woolled sheep pay double the profit of oxen, fine-woolled sheep double the profit of the coarse, the value of which can be quadrupled by the manufacturer.* It is asserted, on similar authority, that “*black, heavy heather, and mossy pastures make the finest wool*”—yet we daily see on such, and on poor commons generally, the coarsest, thinnest, and most shaggy fleeces, as well as light and fine fleeces. Granting *quality* of soil and food, to have any effect on the quality of wool, (a doubtful point,) I incline to think, that the richest down-lands, well stocked with the sheep-grasses, would preserve wool in its purest state.

A report has been some time in circulation, that the SOUTH-DOWN sheep are losing ground, both in Norfolk and Suffolk, and that the original Norfolk breed is about to take the turn in supplanting its rivals: this report, however, derives no credit from the transactions and opinions of the last Holkham shearing meeting, although its existence may be there traced. On the other hand, the South Downs are obtaining a footing, and it seems successfully, in Westmoreland, introduced by J. C. Curwen, Esq. of Bell Isle, Windermere. Mr. Curwen finds that the South Downs endure the rigour of the climate perfectly well, and that shearling tups of that breed accompanied the hardiest native sheep throughout the whole winter, on equal terms, and remained in equal condition.

A COMPARATIVE EXPERIMENT, extracted from the Farmer's Magazine. Three wedder hogs of each of the following breeds,—LEICESTER—SOUTH DOWN—Cheviot and Forest, or black-faced Heath, of nearly the same age, and in the same condition, were procured for this experiment made at Edgerston, in Roxburghshire. They were weighed on the 10th Nov. 1802, kept together at turnips, from that day to

April 16th following, and thenceforward on good pasture, until the 10th of Nov. 1803, when they were again weighed, and on the 15th the best sheep of each lot was slaughtered, at Jedburgh fair; the whole result as under: Prime cost of the LEICESTERS £1. 6s. each — Weight alive (Nov. 10, 1802) of the three sheep 76, 75, 68lbs. Total 219lb. Weight, Nov. 10th, 1803 — 134, 131½, 135½lbs. Total 401lb. Total increase in the year 182lb. Best sheep slaughtered Nov. 15—Carcase 74lb. at 6d. £1. 17s.—Offals 57lb. 13oz.—12s. 5d. Wool 5s. 6d. Total £2. 14s. 11d. Deduct prime cost £1. 6s.—Gain of a year's feeding £1. 18s. 11d.

SOUTH DOWN. Prime cost £1.—Weight alive 77, 69, 71lb. Total 217—Weight Nov. 10, 1803—138, 136, 124½. Total 398½lb. Total increase in the year 181½lb. Best sheep slaughtered Nov. 15—Carcase 74lb. 3oz. at 6d. £1. 17s. 1d. Offals 57lb. 10oz.—14s. Wool 5s. 2½d. Total £2. 16s. 3½d. Deduct prime cost £1—Gain of a year's feeding £1. 16s. 3½d.

CHEVIOT. Prime cost 15s.—Weight alive 64, 59, 59lb. Total 182lb. Weight Nov. 10, 1803—128½, 101, 117. Total 346½lb.—Total increase in the year 164½—Best sheep slaughtered Nov. 15. Carcase 64lb. 11oz. at 6d. £1. 12s. 4d. Offals 50lb. 3oz. 9s. 4¾d.—Wool 3s. 9½d.—Total £2. 5s. 6¾d. Prime cost 15s. Gain of a year's feeding £1. 10s. 6¾d.

FORRESTER. Prime cost 13s.—Weight alive 70, 70, 59lb. Total 199lb.—Weight, Nov. 10, 1803—135, 125½, 115½—Total 376lb.—Total increase in the year 177lb.—Best sheep slaughtered Nov. 15. Carcase 71lb. 3oz. at 6d. £1. 15s. 7d.—Offals 61lb. 4oz. 11s. 1¾d.—Wool 2s.—Total £2. 8s. 3¾d. Prime cost 13s. Gain of a year's feeding £1. 15s. 8¾d.

Every one interested in the result of experiments like these, will both wonder and regret that people

who give themselves the trouble of doing a thing which requires a whole year's attention and observation, should do it by halves, and in consequence, imperfectly. Nothing is here finally determined, for want of taking account of the weight and cost of the food consumed by each separate lot. The sheep should also have been weighed, when taken from turnips, and the name of the experimenters have been given. The superior store-cheapness of the forresters would lead to deception, were we guided by it, to decide in their favour, since such is a temporary consideration, unless it can be proved that forresters can be bred cheaper, and always afforded cheaper, in that proportion. All of the decisive kind, in this experiment, must result from a comparison alone, of the store-weight with the fattened weight, and in that view, it will appear, the CHEVIOTS obtained the victory. They were about one in ten, the smallest stock, a valuation of the food consumed by them, ought to have determined, whether they consumed less in that proportion.

ANGORA GOAT. There are two species of the goat, at Angora, in Natolia, the *Kara-gueschy*, or common black goat, resembling that of Europe, and the *Tistik-Gueschy*, or the famous wool-goat, from which the fine shawls are made. The former has a sort of short fine hair, an inch or two long, under its exterior coat, which is obtained by washing the skin in water saturated with lime. This is exported to Europe, and used in the manufacture of hats. This animal is common to all parts of the East. The wool, or shawl goat, is peculiar to the neighbourhood of Angora, and it is pretended will degenerate elsewhere. The Angorians are very tenacious of this animal, and work up all its wool in their home manufactures into a species of superfine shalloon, or camlet. The fila-

ments of the wool of the Angora goat, are long, delicate, silky, and naturally curled; of extreme fineness, and superior softness and pliancy to the finest Merino wool. The fleece is, in every part of the animal, equally fine. About two thousand looms are continually employed at Angora, in manufacturing this wool, of which none is ever exported; each loom maintains from five to fifteen workmen. The only goats of this species, in Europe, at present, are a few at the national farm of *Rambouillet*, in France; but as it has of late been recommended to the English cottager to keep a goat, for the sake of the milk, those of Angora would surely be preferable to all others, both on account of their valuable fleece, and their flesh, which is said to be far superior to that of the common goat.

SWINE.

THE SWINE stands thus described, in the scientific arrangement of Natural History.—GENERIC CHARACTER.—*Front teeth* in the upper jaw four, converging. In the lower jaw six, projecting. *Canine Teeth*, or *Tusks*, in the upper jaw two, rather short. In the lower jaw two, long, exserted. *Snout* truncated, prominent, moveable. *Feet* cloven. This genus is, in some points, of an ambiguous nature, being allied to the *pecora* (cattle) by its cloven hoofs, and to the *feræ* (wild beasts) in some degree, by its teeth; yet differing widely from both in many respects. It may therefore be allowed to form at once, a link between the cloven-footed, the whole-footed, and the digitated

quadrupeds. Dr. Shaw's General Zoology, vol. ii. part 2. p. 458.

Leaving to the Jews to reconcile with common sense, their abstinence from the use of Swine's flesh, we may safely proceed in writing its panegyric. The ancients were well aware of the excellence of pork, both fresh and preserved, and were large hog-feeders; insomuch that we read of stocks in Italy and Gaul amounting to upwards of a thousand each, ready at one time, and one of the ancient writers quotes one hundred as a small herd of swine. It is not improbable, that the reputation of Westphalia for the excellence of its cured pork, is derived from an high antiquity. The superior delicacy and luxurious flavour of young milk-fed pork is acknowledged, although such a commodity is not to be obtained in every part of the country. Pork, of all other flesh meat, is best adapted to curing and preservation with salt, and has the further merit of never cloying the appetite; for it appears that men will subsist longer upon that diet, without desire of change, than upon any other flesh; in various parts of the country the labourers, and even the farmers themselves, very rarely taste, or desire to taste, any other. It is, doubtless, from its solidity, the most oeconomic and the most nutritious food, and I have often admired, not only the contentment with which farm-servants, male and female, will eat bacon three or four times a day, and every day, but also at the considerable way a few pounds will go, at a dinner, pretty numerously attended. The superior solidity of swine's flesh is most clearly apparent, by a comparison of the external superficies of a fat pig or hog, with that of a fat sheep or bullock, the dimensions of which latter animals must be so much more extensive to equal the weight of the former. What a difference in measurement and extent, ap-

pears to the eye, between a fat bullock of ninety stone, and a fat hog of the same weight ! If, on these considerations, pork and bacon must be accounted the strongest nourishment, and properly adapted to the stomachs of the laborious and robust, it is yet generally salubrious, when fattened upon wholesome provision, (by no means always the case) ; and I know of no just reason for banishing pork from the table during the summer season, a plentiful period for milk, which makes the best pork. It must not be forgotten, however, at the foot of the account, that the superior excellence of swine's flesh is materially to be attributed to the superior food which they require, and that pork or bacon will always be solid and good, in exact proportion to the solidity and goodness of the articles on which the animals have been fed. For although grass, hay, roots, or oil-cake will fatten a sheep or an ox, perhaps to the maximum point of goodness, nothing hitherto discovered, will do the same with a swine, but milk, corn, or pulse. Fattened on roots he weighs light, his flesh is unsubstantial, wastes much in cooking, and is of a faint, unsavoury flavour. Oil-cake, graves, and all articles of that description, produce in hogs flabby ill-tasted flesh, and loose rank fat ; slaughter-house offal has an effect within certain degrees, similar, and roasted pork so fed, gives plenty of high-coloured gravy, of a strong, but not very delicate scent. Nuts are said to make greasy and wasting pork ; in fine, milk and corn will alone make good, and although a proportion of roots may be substituted for those valuable articles, the meat, although good, will yet be, in exact proportion, reduced in value. This consideration by no means detracts from the advantage of feeding hogs with potatoes, or other cheap substitutes, in times of dearth and scarcity of corn, since necessity will then compel us to eat inferior

pork, and it is comfortable to be assured, that a very good and passable commodity may be raised by feeding with even baked or steamed potatoes alone, and still better, with a small addition of pea or other meal. The swine, I believe, differs from all other land animals in the circumstance, that the fat entirely covers his muscular flesh, in one continued layer or stratum.

But the advantage of this species of live stock is by no means confined to the good quality of their flesh; taking all their distinct merits into consideration, it is extremely probable, that they are, both to the individual feeder, and the country at large, the most profitable of all the domestic animals, however they are in many places neglected, where their presence would prove a great source of profit, and notwithstanding they have so partially shared the notice of our great exhibitors and improvers. Indeed it has always been fashionable to be afraid of pigs; they have not been so well understood as other stock. The sensible and well-informed Mortimer was yet absurd enough to repeat the old apprehension from Markham and the ancients, that pigs might become so numerous as to eat one another! And the opinion-hunting Lisle, after a long string of the lamentable disadvantages of pig-keeping, gives it as an old saying, "that a sow is enough to ruin a poor man;" an opinion, in a certain sense, not far distant from the truth; nor are they to be kept with profit by the farmer, without an adequate judgment in them and their management and sale, and in the cheapest mode of fully and constantly providing for them: these pre-supposed, it is averred, that generally one hundred pounds laid out in swine, will return a greater profit, than the same sum invested in any other kind of live stock.

To descend to particulars, the sow produces more young than any other quadruped, and pork can be fattened more speedily than any other flesh we eat; many pigs are annually, in the dairies, made excellent meat in six weeks. A sow will bring and wean properly, and without injury, two litters within the year; and if to this we add the early maturity of the young females, it will easily appear, how soon a vast and multitudinous stock of pigs may be raised. In fact it is well known to observers of the times, how materially instrumental this species is in restraining exorbitance of price in other articles of the flesh market, and a fall of prices is generally preceded by an overflow of pigs. Swine have ever been accounted the gleaners of all the refuse and waste of a farm, and the only domestic animals capable of converting into nourishment the produce of the forest; hence it has been too generally supposed, that it is not profitable to extend their province, or to increase their number to the degree of rendering it necessary to grow provision expressly for their support, a very erroneous opinion, and very injurious to the public interest; since, under judicious management, none of our animals will pay a better price for what they consume. Any farming situation may be rendered suitable for pigs, and in many it would be very advantageous that they constituted the chief stock; the dung of fattened or well-fed hogs is of great importance in the improvement of land.

The Swine will live until twenty, and even thirty years of age, and the old writers aver, that the boar continues to grow to the end of life. With respect to any marks to ascertain the age of swine, nobody is solicitous, since they are constantly killed young, and there is no motive to keep them until they become old. The form of the EAR in this genus, and

the quality of the hair, are leading marks of distinction. The pendulous, or lop-ear, and harsh hair, generally indicate large size and the thickest skin. Erect, or prick-eared pigs, are of smaller size and quicker feeders. Columella says, the soft and smooth-haired pigs are best adapted to warm climates; indeed they are generally produced in such. Much of the absurdity, and some of the lying wonders of old times, have been propagated by modern writers concerning these animals. The Count de Buffon, who was only a natural philosopher, and had not the honour of ranking with the *illuminés* or amateurs as a feeder of swine, insists much on their insensibility to blows, and the voracity and vast capaciousness of their stomachs, overloading our intellectual digestion with the old tale, that mice have been known to eat in the backs of fat hogs "grots and labyrinths to dwell in," without the said hogs seeming at all sensible of the intrusion! As a companion to which, the Count might have added from Pliny, that "Every pig knoweth his own teat which he was born to, and sucketh only that, and none other; and if you take away the pig, the teat drieth." Or from Varro, "that the wolf, as soon as he has caught a sow, draggeth her to the water, because his teeth are unable to abide the heat of her flesh." Of the voracity of hogs, instances are common; and Goge relates, that in his days, a sow in Sussex, devoured an infant; but on the immeasurable capaciousness of their stomachs, many great mistakes have been made; swine are equally liable with other animals, to have that organ overloaded, and possess their full share of the inconveniences and dangers of indigestion.

The hog is a native of all the temperate climes of the old world, but was not found in America, until introduced by the first discoverers, the Spaniards, whose

black breed has had a wonderful increase, both on the American continent and in the islands. I am ignorant what degree of credit is due to the authority of the naturalists, who assert that Swine are not indigenous to the British isles. They are no longer found wild among us, and I believe in France, the savage wild-boar was destroyed and rooted out, with the more savage feudal laws. Mr. Tattersal, immediately before the Revolution, brought home with him from Chantilly, a young boar and sow, of the real wild species; indeed for the genuine fierceness of themselves and progeny, a noble Lord, Mr. Tattersal's guest in Ely, had the best reasons to vouch; for, venturing down the yard at midnight, unattended by a guide, he was suddenly alarmed at a scampering of numerous feet, accompanied with such a horrid barking, grunting, and yelling, as would have done no discredit to a legion issuing from the infernal regions; and if my Lord had not possessed a good pair of heels, and athletic powers sufficient to carry him, extempore, over the height of a five-barred gate, his situation would not have been at all enviable. I dare aver that Lord Nelson, Earl Moira, and Sir Sydney Smith, little as they are practised in retreats, would have determined upon one, *sur le champ*, from an enemy like this. It is to be regretted that Mr. Tattersal has not preserved the wild breed intire, since, by all accounts, the flesh was delicate and excellent in the highest degree. He has a young sow remaining, perhaps full-bred, and a young boar mixed with the Suffolk and some other breed, which may make a very good cross for delicate pork.

The European wild-boar, the original stock of our domestic breed, is still to be found in the forests of Germany, and elsewhere on the continent, and is generally preserved as a beast of chase. He is of a dark,

brinded, grey colour, sometimes nearly black, or of a dusky yellow, with longitudinal stripes, like those of the domestic kind, called *corderoy* pigs. He is smaller than the tame hog, with upright, wide ears, long powerful snout, large head and shoulders, high crest, deep short body, and thin hinder-quarters, and endowed with considerable activity. The AFRICAN hog is red, or sandy in colour, with a small head, long slender pricked ears, soft and short hair, and a long tail touching the ground. I know not whether this be the same variety used in this country as a cross, under the name of the African. The ÆTHIOPIAN has wattles under the eyes, is large, and in a wild state. The CAPE VERD hog, another African variety, is also large, with more length than the former. The BABYROUSSA, or Indian, and the PECCARY, or Mexican hog, seem to be admitted of the *Sus* genus, rather by the courtesy of natural history, than by any very clearly defined right. They are honorary members.

The small, almost naked, short, large-bellied black pig of CHINA, with the white, have been long well-known in this country, as a cross for fineness of bone and quickness of proof. Whether the PORTUGAL, of nearly similar form with the last, be only a variety of that species, I am not informed, or whence we derive the large, thick-hided *tonky*. The native pigs of Ireland, France, and Germany, at least such of them as I have seen, are of the large, flat-hided, heavy-eared breed, with longer legs, and of still worse form, but resembling our old breeds of York and Shropshire. In Batavia they have long used the *tonky*, or short cross. I have heard that our sandy, or rufous pigs, are of Italian origin, and that the neighbourhood of Turin is celebrated for its excellent breed. The Bosnian and Servian pigs, with which the markets of Vienna are supplied (if we may credit tra-

vellers) have the character of being at once the hardiest, and the handsomest in the world, and such as will stand travelling with the least waste. The hogs of Curdistan, in Asia, are of the largest size and weight. Aristotle and other ancient writers mention a peculiar variety of swine in Illyria, which do not divide the hoof: Mascal says, this whole-footed breed existed in his days, in the neighbourhood of Windsor, and that they were a large and superior species: on inquiry, I find some remains of this variety have been found in Berkshire, of late years, but they have now ceased to be a distinct variety, and a few individuals only of them are occasionally met with.

Nothing can be more groundless than the common assertion, that "there is no such thing as breed in pigs," the only meaning of which is, that the assertors have not taken the pains to seek it. The number of regular breeding counties of this article of stock is considerable, and the peculiar characteristics of form, in each variety, as distinctly marked, as in any other class of animals. That there are numberless intermixtures, that radical changes are introduced in the course of time even in those districts most prejudiced in favour of their own peculiar variety, and that in many counties, where a few only are bred for home use, they have no settled breed, is a common case with every other species of cattle.

The chief distinction of old, in this country, seems to have been between the up-eared and lop-eared, or the small and large breed, the latter of which, Markham says, were to be found in perfection of size in the midland counties; but that "no county in England breedeth naturally better swine one than another; and that the mast country pigs are good feeders but no great breeders." I am by no means able to trace the commencement of our improvement with the

southern pig, or, as they phrase it in Hampshire and Berkshire, the *pug* or *pompey*. The *Chinese*, or *Bantam*, or *Portugal*, *African*, *Spanish West India*, or *wild boar* cross, has, however, been used, more or less, in every part of this island, and in some breeding districts, has been universally adopted and blended with the native stock. When I asserted, in The New Farmer's Calendar, that the southern cross had *not* improved our breed, it is probable that prejudice might have some share in the assertion. My reader is aware, that I do not love all fat, even in bacon, yet surely good shape and growth have been too much sacrificed to that mould which produces only fat. Among our native pigs, there was, doubtless, a small breed improveable in itself, also a wild breed in early times, ever an excellent cross to reduce the size, and amend the coarseness of large stock; that, independently of any external assistance, we might at this instant, have had our pork equally delicate, and have derived as great a weight of it from a quarter of corn, or a given quantity of milk. I will yet freely acknowledge both the beauty and excellence of various small breeds, which have originated in the China cross, and subscribe fully to the merits of the present Berkshire stock. But *est modus in rebus*, and whilst a cross or two of the round, waddling, shapeless, small-boned stock in question, may give width, and substance, and the fattening principle to our leggy and flat-sided breeds, reducing and improving their huge heads and ears, a farther repetition goes to destroy all symmetry and power of growth in the animal, and tends solely to the production of blubber. Another ill consequence of breeding in and in, from the tonky species, is a reduction of the procreative power, appportionate to the acquisition of that of over-fattening, the new variety of sows having few pigs at a birth, and being

generally very bad nurses: at the same time, the pure foreign breed, and perhaps the produce of the first cross are extremely prolific. Bakewell's new Leicester variety, from their dish-faces, their size and colour, most probably a mixture of the China and the old Leicester breeds, is liable to the above-stated objections. This breed has never attained any equal share of that high and universal repute possessed by the new Leicester sheep; yet it might be a good cross, had we not a far better in that of Berkshire. Some of the best new Leicester pigs which I have seen, were at Sir Lawrence Palk's, in Devonshire, who sets an highly commendable example to the country, by breeding a considerable number of this profitable species of stock, as well as of the superior kinds of neat cattle and sheep.

Almost all the prize-pigs which I have hitherto seen, were of a mixed breed, and of the tonky species, pretending to no merit whatever in respect of form or symmetry, but solely that of carrying the smallest possible quantity of *flesh* upon their bones. I submit it to improvers, whether regularity of form and just proportions are, or are not, of any consequence in swine: if they are, *whether a thorough-shaped pig of one of our best reputed and unmixed breeds, ages equal, would not produce a greater weight of pork or bacon, in return for a given quantity of food, than one of our present fashionable tonks?* The former would, at any rate, most probably be worth a penny per pound more than the latter, allowing the predilection of a *minority* for all fat. But however well fattened and ripe, this old-fashioned meat might be, there is a respectable corporation of citizens whose relish it would not suit, because it would militate powerfully against their interests.—I allude to the cooks, both on board and a-shore. To be silent on the head of

naval perquisites, as I have, years since, left state affairs to abler judges, I shall give an example on shore, which my readers need not doubt. A mistress, some time since, succeeded to a large boarding-school. She told the cook, it was her determination not to allow the perquisite of kitchen-stuff, but a certain sum in lieu thereof, demanding what might be the annual amount. Mrs. Cook answered very reluctantly, about five or six pounds, she believed. Well then, said the mistress, I shall allow you seven guineas. The kitchen-stuff was sold for thirty-five guineas the first year. I could tell some tales of this kind of far more general consequence, in which case, those who ought to receive most benefit from the intelligence, would, no doubt, most justly blame me for interrupting their repose.

As to the FORM of a pig, the improving reader will advert to those general ideas of proportion and symmetry already so repeatedly insisted on; they are of equal validity and consequence, be the animal pig, sheep, or ox. Depth of carcase, lateral extension, breadth of the loin and breast, proportional length, moderate shortness of the legs, and substance of the gammons and fore-arms are great essentials. These are qualities to produce a favourable balance in the account of keep, and a mass of weight which will pull the scale down. In proportion too, as the animal is capacious in the loin and breast, will be generally the vigour of his constitution; his legs will be thence properly extended, and he will have a bold and firm footing on the ground, to which, however, it is farther necessary that his claws be upright, even and sound. To be sure, a good hog may have a coarse, long, ugly head and ear; he carries them himself; and the thing may be safely classed among the non-essentials; yet a short, handsome, sprightly head,

with light, pointed, pendulous ears, of moderate size, are pleasing to the view, and may sometimes have a favourable effect in the market. For head and ears the Oxford or rather smaller Berkshire pigs are good models, and for true shape the improved Shropshire, Hereford, and Gloucester. If colour deserve any consideration, I should prefer the light and sandy and yellow-spotted; at least such skins appear far the most delicate when dead. In respect to the skin of pork, I have elsewhere stated my preference of the thick to the thin skin, assigning my reasons for it. Our best-bred pigs are often thick-skinned, but such skin is tender, gelatinous, shining, easy to masticate, even in the shape of roasted *crackling*, and very nutritious; whereas to eat the crackling of thin-skinned pork, case-hardened by the action of fire, requires teeth equal to the division of block-tin. The health of swine is to be estimated by their cheerfulness, by the gloss upon their coats, and their skin being whole and free from eruption: it is an extremely unfavourable indication when the head is hung down, the snout approaching the earth like a fifth leg, and when the flanks heave and are hollow. Our old sages teach, that in plucking the bristles of a hog, if he be diseased, globules of blood will stand on the roots of the hair. If pigs *bark* on being alarmed, it is an excellent sign of sound health and good keep.

The chief PIG-BREEDING COUNTIES in England, at present, are—SHROPSHIRE—HEREFORDSHIRE—GLOUCESTERSHIRE—WILTSHIRE--BERKSHIRE--HANTS--NORTHAMPTONSHIRE—LEICESTERSHIRE---LINCOLNSHIRE--YORKSHIRE—NORFOLK—SUFFOLK—ESSEX. The inland, north-west and north-east districts, have generally bred the largest swine.

SHROPSHIRE has long bred stores for the supply of the London feeders, and of the Essex farmers, who

thus turn their clovers to the most profitable account. The standard colour of this breed is white or brindled; and, anterior to the late improvement, they might be looked upon, as nearly as possible, the original large breed of England. Of the largest size, flat bone, deep and flat-sided, harsh or rather wiry-haired, the ear large, head long, sharp and coarse, leg too long, loin, although very substantial, yet not sufficiently wide, considering the great extent of the whole frame. With all their defects, they were ever excellent stock, and have been improved within the last fifteen years by the Berkshire cross, which has reduced the length both of their legs and carcase, and rendered their heads lighter: in consequence the new variety, shewing the Berkshire spots and form, feeds quicker than the old.

HEREFORDSHIRE. This is a variety of the Shropshire, or an intermixture, which cannot now be traced. They are shorter, have less bone, and lighter heads, ears smaller, thinner, and more pointed, coats somewhat less harsh than those of Shropshire, and are quicker feeders. There may be found in this breed, many individuals of the truest form; they are generally good, sound stock, full of growth, and assuredly among the most profitable bacon-hogs we have. These also have been of late crossed with the Berkshire boar, of which the best of them did not stand in any great need. Original colour light.

GLOUCESTERSHIRE. A size under the last, and a shorter and more truss pig; there is also, I think, a handsome roundness, or *tournure*, of the bones and frame, which distinguishes this breed. Years ago, I used to see many sandy pigs among them, and some with very heavy, thick ears. They are not now so heavy-eared. They are good stock for any purpose,

and are bought up as stores with those of the last-mentioned counties.

WILTSHIRE. Many years ago, this county was supplied with considerable numbers of store-pigs from Wales, and from their form, there was probably a Welsh cross in the old Wiltshire breed;—they were long-bodied, low and hollow about the shoulder, and high on the rump, middling large pointed ear, round bone, light in colour. Of late years this breed has been crossed with the *pug*, and with the Berkshire. The new variety appeared to me last year, smaller than the old breed, and darker in colour, spotted, with round carcasses, handsome pug face, and some with prick-ears. This cross is, however, by no means a new thing. The boars originally made use of, were of the wild breed from Barbadoes, in colour red, or red spotted with black. They were sent from that island, more than fifty years since, by a gentleman to his relative at Axford, near Marlborough, and thence the variety produced, were long called the Axford breed. Without doubt the Axford smaller variety, and part of the new Berkshires, originated in the same source. Wiltshire, exclusive of its home consumption, sells annually a moderate number of stores.

BERKSHIRE has been, perhaps for centuries, famous for its breed of pigs, and at this day has lost none of its pristine reputation, insomuch that in most parts, where they do not discriminate very minutely on the breed of swine, any one being spotted and having pendulous ears, is called a Berkshire. The old breed is now so totally worn out, that I believe for many years past, no possibility has existed of obtaining a living model. They were thus described to me in 1790, by several persons who had known them more than forty years before that period: long and rather crooked-snouted, large heavy ears, body long and

thick, but not very deep, legs short with much bone. They then made great weights. The new or present breed of Berkshire, is lighter in the head and ear, shorter in the carcase, with somewhat less bone, and higher in the leg, in colour generally dark spotted. The Berkshire breeders have made a very judicious use of the pug-cross, by not repeating it to the degree of taking away all shape and power of growing flesh, in their stock; and I am informed they now mean to discontinue any farther mixture. The breed, as it now stands, is about in the third class, in point of size, excellent in all respects, but particularly as a cross for heavy, slow-feeding sorts. The small porking variety of Berks, and those of Oxfordshire, with round carcasses, short and handsome heads, appear to me to have descended from the Axford breed above-mentioned. Berks and Hants, from their convenient distance, are constantly sending up young stores to Smithfield market.

HANTS. The Hampshire pigs are generally dark spotted, some black, of a longer and flatter make than those of Berks, ears more pointed, head long and sharp, resembling the Essex. I speak of them as they are found in the range of Basingstoke, Andover, and Newbury. They are generally bought up with the Berks stock, the dealers themselves unattentive to any distinction between the two varieties. The goodness of the Hampshire hog is proverbial, and I have never observed in any breed, greater or quicker proof.

NORTHAMPTONSHIRE. I recollect formerly, in this county, a handsome, light-eared, white, deep-sided pig, with middling bone, and quick of proof: the breeders have since tried the new Leicester, and, if I am rightly informed, without success. They have again, it seems, returned to their old breed, adopted

some improving cross, and at present, breed middle-sized well-shaped pigs, both for their own and the Buckinghamshire dairies.

LEICESTERSHIRE. A very ancient breeding district; the original stock large, deep and flat-sided, light-spotted, with rather handsome head and ear. I am not informed whether the Bakewell variety has much honour in its own country. I have seen in this county, and in Rutlandshire, remarkably handsome and good spotted porkers.

LINCOLNSHIRE. This breed was formerly light-coloured and white, like those of Northamptonshire, many of them having curled and woolly coats. They are still, middle-sized, quick-proving pigs. The county sells a considerable number of stores.

YORKSHIRE. The old breed, probably the worst large variety we had; extremely long-legged and weak-loined, their constitution not of the soundest, and bad styepigs in the winter season; they were yet quicker feeders than some of the superior breeds. They have been improving some years from the Berkshire cross, but are still inferior to the north-western stock, rendering a less price at market. Probably short-legged Gloucestershire boars might succeed with this breed, or the entire adoption of Hereford stock might be attended with still more profit. Yorkshire has, immemorially, sent up to the London markets, great numbers of lean stores, throughout the winter and spring.

NORFOLK breeds for market great numbers of a small, short, up-eared porking species, various in colour, white, blue, striated; generally an inferior commodity, which it would be to the interest of that great corn county to improve; they are yet of a thin-skinned, quick-proving kind. In the vicinity of Lynn,

and generally on the Lincoln side, there is a larger spotted variety of very good form and quality.

SUFFOLK. The small delicate white pigs of this county have, for many years, had great reputation; and at this time, there is not only a strong prejudice in their favour, in their own county, but they have many advocates out of it. They are shorter, and more pug-formed than the Norfolk, and by their dish-face, and pendent belly, it may be supposed, that the variety proceeded originally from the white Chinese. Some of the Suffolks are very handsome, and very regularly shaped; their defects are, that they are great consumers in proportion to their small bulk, and that they produce little flesh. I should suppose that a small Hampshire boar would be a profitable cross for Suffolk sows.

ESSEX has long been a considerable breeding county, but has declined in that respect, of late years, as well as in attachment to the old breed: they were up-eared, with long sharp heads, roach-backed, carcasses flat, long, and generally high upon the leg; bone not large, colour white, or black and white, bare of hair, quick feeders, but great consumers, and of an unquiet disposition. A mixture of the tonky with this old breed produced an improved and shorter variety, called the *half-blacks*, a very useful kind of pig, as I have often experienced; they are chiefly found in the Rodings, or northern quarter of Essex, and have not, I fear, received any farther improvement by late repetitions of the cross. Essex has always been in the habit of receiving annually, Shropshire, Hereford, Gloucester, and Berkshire stores, to graze the clovers, whence a great mixture of breeds in the county: a good permanent native breed is perhaps a desideratum there.

From CORNWALL I have had a dog, or rather wolf-shaped breed of pigs, spotted, with sharp heads and ears, and rather long legs, which were represented to me as models of the original varieties of that county and of Wales; and from DEVONSHIRE, handsome, short, quick-thriving porkers, of light and sandy colours. In SOMERSET, there is a large breed resembling that of Shropshire. In CHESHIRE, they have crossed the large breed with the tonky, and fatten their stock for Birmingham and other great towns. STAFFORDSHIRE has also the mixed breed. DERBYSHIRE formerly bred, perhaps the largest pigs in England, a heavy, sleepy, slow-proving breed, with immense bone, and thick ears, the size of a huge cabbage leaf: that county does not breed much at present, but I believe, purchases Yorkshire stores for the dairies. WARWICKSHIRE, a large, bony, spotted breed, with heavy ears. WORCESTERSHIRE, great size and growth, apparently a variety between the Hereford and Warwick. OXFORDSHIRE large breed, a variety of the Warwick; small porking breed, of the Berkshire, as has been said. I am assured by my friends Messrs. Wynts, that the best dairy-pork in England is furnished for the London market by Banbury, Brackley, and that neighbourhood. BUCKINGHAMSHIRE, also famous for dairy-pork, is supplied with stores by Northampton, Oxford, and Berkshire. SUSSEX, SURREY, and KENT, have always been supplied, at their annual fairs, with Hereford, Gloucester, and Berkshire pigs, and the breed of the former counties has originated in such a mixture, crossed and shortened by the tonky, or pug. HERTFORD and CAMBRIDGESHIRE have a lop-eared variety resembling the lighter breed of the midland counties. My information respecting this species of stock, does not extend farther northward than Yorkshire; but I hear that the breed of pigs has much increased of late

years in those parts, and in Scotland; and to our northern improvers, I beg leave to recommend the remarks which I have just finished on the merits of our English varieties. In the Scottish isles, and in the vicinity of Stirling, I understand, they have very good small foreign pigs, adapted to the purpose of crossing. In WALES, I hope the old breed is nearly extinct, and that breeders bordering upon the best pig-districts of England, have not failed to take advantage of so favourable a circumstance.

BREEDING. In situations where is a certain vent for the stock produced, the breeder will be well repaid for growing and purchasing food on this account. Pig stock is disposed of in the shape of lean stores, young or full-grown; half-fat stubble pigs, fat porkers, hogs, pork, bacon, pickled pork. Pork is packed and sent up to the metropolis, from those parts which are within a reasonable distance. Great quantities of bacon and pickled pork from the north, find a sale in the London markets; the commodity of this kind from Yorkshire, is generally young, full of flesh, and at a reasonable price. Breeding in proportion to the greater trouble and risk, is more profitable than purchasing the stores. If it be intended to breed for sale, in a store state, it is of the more consequence to procure a regular and well-shaped breed; such will always meet a preference in the fair or market, more particularly if they are to be driven towards London.

The best stock may be expected from the boar at his full growth, but not more than three to five years old. No sows should be kept open for breeding, unless they have large, capacious bellies. Being well fed from the teat, the sow will procreate at seven months, and if she be of the kind, in which the strong tendency to fat increases the risk of parturition, probably the suffering her to breed as early and as quickly as pos-

sible, may contribute to amend the defect. If a sow of this description would admit the boar, the third, or within a few days after pigging (and I have witnessed a few such instances) imposing upon her the severe task of constant breeding and suckling, would doubtless keep her sufficiently lean and roomy for the entertainment of a good litter; the quality or size of the pigs, under this system of multiplication, I cannot warrant. It may be as well to kill ordinary sows after they have had two or three litters, but I think no breeder should part with one, whilst she continues to bring large litters, and to rear them with safety, although that kind of reason, called custom of the country, often induces a man to kill such an one, and to substitute another of perhaps half its worth.

The sow brings forth a few days after four months, and the middle of January, and the middle of July, I have found to be the most advantageous pigging seasons, because young weaned pigs are more sensible of the cold than those which suck, and there is little to dread on that score, in mid-March, when the January pigs are weaned. One or two persons speak in favour of rearing pigs throughout winter, but I can really see no object to counterbalance a risk, which has ever been obvious enough to nine-tenths of those who have made the essay. I tried late-weaned pigs for the last time, in November 1791, and observing them shrivelled, squeaking about, and indeed on the point of perishing, in a well-littered straw-yard, I ordered a score or two of them, into a large stable, the temperature of which was higher, than that of any room in the dwelling-house. It served no good purpose, many died, indeed fortunately, for the survivors never repaid their keep. An August litter will perhaps pay best as roasters, in which case, the sow going to hog sooner by several weeks, than if time had been

given to rear the pigs, will bring forth in a favourable season in the following spring. I have sometimes thought it might be advantageous with a late litter, to suffer them to suckle and feed with the sow, the keep being of the most forcing kind, during three or four months, from which method might be expected the most delicate Christmas pork to match with house-lamb.

As sows advance in their pregnancy, they ought to lodge separate, least their bellies be hurt by others lying upon them; it is of still more consequence, that no other swine be within reach of them, at the time of parturition, since, in that case, the pigs would, most probably, be devoured as they fall. The sow should be attended in pigging, night and day, if it be made a point to preserve all the pigs; and indeed frequently and watchfully during three or four days; she may require manual assistance, especially if she be too fat. As I hinted in *The Farmer's Calendar*, a convenient PIGGING-HOUSE, so contrived, that the pigs may escape the crush of the sow, at her downlying, is a desideratum. Should the sow show the unnatural desire of devouring her progeny, she must either be muzzled, her snout fast strapped for several days, the trouble being taken to attend her meals, or the experiment may be tried of anointing the pigs with a pomade of train-oil and common aloes. Dry and warm LODGING is almost of equal consequence with food, in pig-breeding, nor should the sow and pigs, nor indeed any pigs, be turned abroad in bad weather. The pigs may be cut in six or seven weeks, that is about a week before weaning. After weaning shut up the sow, feeding her well, and on the turn of the milk, she will express very plainly her desire for the company of the boar.

A regular PIGGERY, upon an extensive scale, should

be detached in some convenient section of the farm yard, and contain separate apartments for every description, with offices for boiling and stowage, and cisterns to contain wash. It prevents confusion in the stud-book, indeed is important to the purpose of improvement, to bestow NAMES on the sows and boars, and distinguishing marks on the pigs.

FOOD. The in-pig sow should be in full strength and heart, but not fat. Whilst suckling, her food should be of the best kind, and in the greatest plenty, provided no waste be made. I have read about the consequence of sows pigging in the season of plenty for green vegetables, but I would recommend to those who make choice of such kind of food for suckling sows, to make some fair experiments of the result, which I believe would be invariably injurious, at least unprofitable. There is an old book extant, which, among various other taking projects, advises to purchase an hundred in-pig sows to be turned into clover, there to pig and shift for themselves, assuring the reader who hath faith, of a splendid profit: but the sanguine projector, from his eagerness in pursuit of profit, had doubtless overlooked probability; namely that of the number of pigs which might be devoured, trampled to death, killed by wet and cold, or from the scouring induced by green meat and their watery milk: and this scheme was copied by a later writer, who, if my memory does him justice, promised his farming readers an annual profit of twenty shillings each doe, on breeding tame rabbits.

The grand article of provision for sows and pigs, and for rearing the latter, is fine pollard, which in cold raw weather, is very comfortable to the animals, scalded or boiled. Pollard may be amended by a portion of oat, barley, pea, buck, or any meal, or either of those may be substituted. Wash made of

pea-meal alone is apt to scour young pigs. Skimmed milk, house-wash, grains, &c. are in course. If roots or vegetables are given to the suckling sow, or to young weanlings, articles of very questionable use, according to my experience, it is far more safe to boil them. In fact, it is vain to think of dispensing with the use of corn, including pollards in that denomination, in pig-breeding or rearing, until the pigs be full three months old. The sow has generally sixteen TEATS, although many of them may be naturally useless; or it may sometimes happen, from defect of being drawn by her first progeny, which countenances the practice of suffering a numerous first litter to suck, as by that means all the teats may be rendered productive. It seldom happens, however, that a sow has more than twelve, or even ten good teats, and it is obvious she cannot maintain more pigs than she has teats. The practice is useless to suffer unthrifty pigs to hang upon the sow, they will ever be profitless themselves, and they detract from the worth of the profitable. It is most beneficial to feed this stock thrice a day, and to continue such practice with young growing stores, unless they have much food to pick up.

A Mr. Saunders, of Stroud, in Gloucestershire, made the following curious proposal to the public, through the channel of the Agricultural Magazine for September 1803. "To point out a plan of rearing and feeding pigs (on condition of a reward for the discovery) which, in his belief, would reduce the price of butchers meat of every description, one third at least of its present value." That his plan would increase the quantity of pigs tenfold, in the course of two years, besides affording the means of their maintenance at one penny a head, per day, little and big, and even under that rate. That the said plan might

create for millions, an ample and unlooked for sustenance, and in its consequences might tend to increase the population of the globe. Mr. Saunders's plan is of a nature and consequence far too magnificent for my handling, I beg leave to refer it to the consideration of Mr. Malthus.

STORES.—I have spoken of the necessity of keeping weanlings, or young stores, well, and of lodging them comfortably. At three months old they begin to be saleable; thenceforward they become more hardy, and better able to shift. WINTER store keep—roots of all kinds, if boiled the better, excepting perhaps carrots, parsnips, mangel-wurzel and rutabaga, which will agree well in a raw state; cabbage, beans and pease, or other corn, the run of the barn-yards and wash. SUMMER and AUTUMN—Clover, lucern, tares, cabbage, shack or harvest gleanings, acorns, mast. This stock may either be confined during summer, and the green meat cut for them, or they may be turned abroad, according to convenience, but the former practice is far the most profitable, since, exclusive of other great advantages, they may have wash allowed them at home; or they may be permitted to graze at large by day, and be driven home at night, when good old warming beans are of great use to counteract the loosening effect of the grasses, which sometimes continues too long. This method will also secure the younger stock, which are liable to become weak and pot-bellied by an entire subsistence on clover. In continued rains, swine should always be taken home. I have seen a strong recommendation of lettuces, and if I understand it aright, for the sow whilst she suckles: so far as I know, I should not approve that vegetable in the case, as of too diuretic a quality, and probable to force the secretion of a poor, weak milk. I have occasionally given a few barrows of waste lettuces to

store pigs, but should not think proper to grow them purposely, on land which would produce clover or tares.

On GRASS-feeding, Mordant, an author most truly belonging to the order of common sense, says, "A foolish custom prevails in a great many places, of turning their hogs to grass, in the beginning of May, to graze in the open field, upon common grass, as their horned cattle do, and hire a swine-herd to attend them. They go out at seven in the morning, and return about the same hour in the evening, when the swine-herd, contrary to all other keepers of cattle, has not the trouble to attend them home, for the poor creatures being kept from their more natural food than common grass, become very much hunger-bit, running home with a most hideous cry (*sauve qui peut*) drowning the sound of the swine-herd's boy, sent before with an horn, to give notice to fill the troughs against these hungry guests come in. I observed that upon the sound of the horn, the children at play made for covert, for a sow that has been sucked and drawn all day at grass, by ten or a dozen pigs, must have a pretty keen appetite at supper, and I have often thought it providential that a child was never worried by these rapacious creatures." I have seen pigs *hard-kept* upon a common, after the slight repast of a few beans, turn and eat their own excrement, ambitious no doubt of surpassing their master in the idea and practice of economy. Much common grass in the spring is said to give swine the *garget*, a disease of a different species in different places, but bad enough in all.

The HORN is certainly a convenient implement where swine are turned out to graze, or gather acorns, or roots, in marshy wastes, when they are apt to separate and stray. Accustomed to the sound, they

are assembled by it very expeditiously and very pleasantly, nor is there any doubt, but it would be equally useful with sheep, as Mr. Bartley has found a call, or whistle. (See his account of feeding sheep with potatoes, An. Ag. 1803.)

Barnaby Goge, in commending the use of the horn, relates on ancient authority, a signal and pleasant instance of executive justice performed by pigs. Certain pirates, who seem not well to have learned their business, since they were unable to swim, had landed on the coast of Tuscany, and carried off the swine from a farm. As the robbers were paddling off from the shore, the herd fortunately returned, and missing his pigs, winded his horn. At the well-known sound, the grunTERS all started up *una et viva voce*, and crowding to one side of the boat, upset her, and swam ashore to their keeper, leaving the less fortunate thieves at the bottom of the sea.

Swine which have the run of extensive forests and wastes, at a considerable distance from home, should have the benefit of sheds or sties, in the forest; and in general, when left abroad in dry parching seasons, attention is necessary to procure them water, for want of which they have sometimes been attacked by fatal maladies.

Slips of YEW and HEMLOCK, both roots and leaves, are poisonous to swine, of which several instances have occurred of late; but HENBANE, according to Dr. Mead, is beneficial and nutritive to them. An instance occurred in Kent, in 1764, of eleven pigs being stung to death by bees.

RINGING the snouts of pigs should be performed at weaning time, after they shall have recovered from castration, and it will be necessary to renew the operation, as they become of large growth. It is generally neglected at first, but no pigs, young or old,

should be suffered at large unrung. It should be ascertained, that the sow's rings are sufficient, previously to her taking the hog, on account of the risk of abortion from the operation whilst in pig. In ringing, care must be taken by the operator, that he go not too close to the bone, and that the ring traverse, or turn easily, and if an error shall have been committed, that it be immediately rectified. SPAYING the sow is performed with much safety in the country, whilst she gives suck. She should be suffered to move about after the operation, and not be glutted with slop victuals. The ancients had a method of searing the matrix of the sow with the actual cautery. I was informed that the business had been, through an uninterrupted succession of more than two centuries, in the family of Cordery, our Hampshire cutter, who had then a son and successor apparent.

Pigs are FATTENED for pork at six to nine months old; for bacon from nine to the age of eighteen months; stores indeed, for some years past, have seldom been kept beyond that age, some few excepted of two years old. The meat I apprehend is never more nutritious than at the age of eighteen months, and such will go so much farther than old sow or stag bacon, that I am convinced, the profit of the latter is hypothetical, or much over-rated. Milk and the meal of white pease is the superior food for pork; in the second place, for either pork or bacon, the best fresh fine pollard and white pea-meal, equal parts, or two parts pea-meal to one of pollard. Fig-dust, or meal of oats, barley, rye, buck and pea-meal, the latter in quantity sufficient to render the flesh firm. Grey pease approach too much the nature of beans, and occasion the meat to be tough and dry.

A hog will probably fatten best by himself, at any rate, the fewer together the better; and it is most

conducive to their thriving that they have room in their styes. They must be ringed. Must be dry, and enjoy that degree of warmth which will render them entirely comfortable, the demonstration of which is, that they lie upon their side and extended. When the hog lies upon his belly and contracted, it indicates a sense of cold, or some indisposition. If inaptitude to thriving be attributed to a foul, scurfy, and obstructed hide, the best remedy is to extend the hog upon a form, and wetting him with a lye made of half a peck of wood-ashes boiled in urine, or salted water, to curry and scrub him clean; then to wash in clean warm water, and dry him with wisps, strewing him over with ashes, and putting him into a deep straw-bed. Should the pigs in a sty conceive an antipathy to a particular one, an occurrence very common, they will not only prevent him from feeding, but fall upon and wound him, and when once they have drawn his blood, will very probably kill him. Such an one being saved, should afterwards be fed by himself if possible. Hence the danger of putting a pig amongst strangers. The method of pig-feeding to profit is, to begin with inferior victuals, if any difference be proposed in that respect; to feed moderately during the first fortnight, or longer if the animals be weak or low in condition, or exhausted by travel, and never, throughout the whole period, to overburden their stomachs, but rather to keep the appetite keen, and the troughs constantly empty, excepting at meal-times, which, in truth, it were preferable to make three times, instead of twice in the day. The pigs having gorged themselves, and blunted their appetite, give to each two table-spoons of sulphur once or twice a day, or in cases of great heat, equal parts of cremor-tartar and nitre, and in a day or two they will recover. Last year I chose for Mr.

Tattersal, a Shropshire store-pig about twelve months old, and weighing about twenty-six stone, which he intended to exhibit fat for Lord Somerville's prize. My cautions to the feeder were superabundant. In a few days I observed the pig lying on its belly, and it soon began to purge and throw up its meat. I recommended a retrenched diet and sulphur, by which the patient was soon recovered and its appetite restored, but not before it had lost at least two stone of substance. From this loss of time it was not exhibited. Mr. Tattersal and his servant were surprised at the possibility of making a hog sick!

The DUNG of fattening hogs should be of middling consistence; if too solid, they probably require more water. It is, after all, a disputable point, whether it be preferable to grind the corn or give it whole; if the latter, something husky should be mixed with it, to insure mastication, as oats with barley or peas. The use of opium has been recommended in fattening hogs; there ought however to be due discrimination in the case, for we find some so exceedingly sleepy without the help of opium, that they will scarcely rise to feed. Antimony having formerly been prescribed as a laxative and alterant, some have actually talked and written of fattening hogs with antimony! Some writer (I believe one under the name of the Complete Grazier) talks of oak-bark and horse-beans to fatten hogs, which would indeed make bacon worthy of the devil or a Russian boor. The Farmer's Magazine (an old and obsolete work) advises "to take the outside leaves of cabbage salted, and let them stand a month, and then, mixed with buttermilk, they will fatten a hog in three weeks." But enough of closet and Grub-street pig-feeding.

It has been said, that although ACORNS will fatten pigs abroad, they will fail in that effect, if the pigs

be shut up. I made the experiment in 1788 with two young Berkshires, which I confined in the sty and fattened upon acorns to the weight of twenty-five stone each, and although they handled rather hard, the butcher who purchased them was not clearly aware of the nature of the meat with which they had been fattened. In some counties they used not to object to acorn-fed pork; it is *firm* enough no doubt.

Beside the farmers, millers, brewers, and other country feeders, hogs are fed in great numbers, by the corn distillers and starch makers, chiefly of London and Bristol, in this country, and of Schedam and other places, in Batavia. By some of the distillers, of late years, oxen have been substituted to hogs, as less expensive to keep, requiring no corn. The store hogs for this purpose must not only be of the regular, large breeds, but also not of those which have been bred up tenderly upon milk. They are fed with grains and wash, and finished with the addition of meal, chiefly that of beans. From this mode of using slop, and acid food, town sty-hogs, although of the largest breeds, never attain the high weights of the country ones fed by farmers and millers, who give solid and more dry food. For example, 40 stones of 8lb. is reckoned a considerable average weight for a lot of the former, which may have been at keep nearly six months, whereas I have seen store hogs in the country, in only the third, or perhaps fourth class, in point of size, put up to solid corn and water, and come out in less than ten weeks, 44 stone a-head. Two years since, a friend of mine in Surrey, fattened nine hogs, the largest weighed more than 69 stone, the average upwards of 50. The profit on the nine, charging the stores at £2. 12s. 6d. each, and the barley at the market price, with the addition of two shillings per quarter for grinding, appeared to be £14. 2s. 6d.

The breed is of that various mixture I have already quoted, but without any pug, and although they appear rather of small size in their store state, and of the deep, flat form, they make very high weights, and in the opinion of my friend, feed as quickly as tonks. One sow had the remarkable litter of eleven, all boar-pigs. I have been since given to understand, that this gentleman's labourers have refused to eat his over-fattened pork. It is not improbable, but there are individual hogs, which might be fattened to the weight of more than 120 or 130 stone.

Hogs being destined by nature to devour and turn to profit the refuse of all eatable things, the circumstance is not overlooked by the refuse and scum of all trades and occupations. In the good city of Paris, as we learn from the Report of last year by Chaussier to the School of Medicine, pigs are fed upon horse-flesh, and as many horses die diseased, particularly glandered, Chaussier expresses his apprehensions on the subject, and requests the opinion of the School. The opinion was, that the method of feeding and fattening pigs with horse-flesh can be attended with no ill consequence, nor can occasion any diseases in persons consuming the flesh of pigs so fed. That as to the case of glandered horses, the digestive powers of the animals destroy every deleterious property of animal substances eaten; that at the Veterinary School, various animals ate of the flesh of glandered horses without any ill effect; and that in a bordering country, there are various shops, where the carcasses of all kinds of all animals, which would be otherwise left to rot, are carefully collected and manufactured into oil, glue, sal ammoniac, prussiate of iron, and Prussian blue; the boilings and refuse serving to feed annually a quantity of fat, healthy pigs, great part of which are pickled for long voyages. In France this mode

of pig-feeding is said to be not above thirty years old, but not being conducted at the commencement, with sufficient privacy, it awakened ill-grounded and anti-commercial prejudices! English reader, after thou hast finished thy comments on continental delicacy, vouchsafe to be informed, that in thine own city of London, no horse-boiler of any eminence or respectability, but fats his sty of pigs upon the soup and bouilli. Once again, *caveat emptor*.

QUANTITIES OF CORN.—Fifty large Norfolks, thriving fast, between 18 and 19 stone each, consumed per day, on the average, $4\frac{1}{2}$ bushels of pease, with wash, or about three quarts each, daily. Hants sow about 11 stone, store state, ate daily $2\frac{1}{2}$ quarts pease, with roots and wash. White hog (chiefly Shropshire) nearly three years old, in fleshy store state, weighing by estimation, nearly 80 stone, consumed three bushels barley-meal, with house-wash, regularly, every seventeen days, or 11 pints per day, the owner assuring me of the accuracy of the account. Earl of Winchelsea's prize pig (1803) of the Suffolk breed, ate of corn and meal, in fourteen weeks three days, 1 qr. 1 bush. 1 pk. or upwards, or $2\frac{1}{2}$ pecks per week.—A Kentish hog, weighing, at six months old, 161 lbs. or 20 stone 1 lb. and in forty-two weeks from that period 53 stone 3 lb. (London bacon fashion, or stripped of head, feet, flare, loose fat, skirts, and kidneys) consumed within the forty-two weeks, 46 bushels of pease and barley. Black and white Essex pig (tonky) weighing at four months old $104\frac{1}{2}$ lb. consumed in forty-seven weeks, 11 bushels 2 pecks hog pease and 18 sacks of meal at 85 lb. per sack, dying in about three weeks after, 33 stone 2 lb. London fashion. A pig weighing 388 lb. or $48\frac{1}{2}$ stone alive, consumed in thirty-one days, three bushels barley-meal mixed with water.

Count Burghaus, director of the economico-poli-

tical society of Helvetia, has lately discovered that hogs' SKINS make an excellent leather for the use of saddle, harness, traces, &c. much stronger than horse or cow leather (alas! to my sorrow be it said, that I must take precedence of the Count for skinning of pigs) and that he has found, contrary to former opinion, that the flesh will take salt well without the skin, and that the salt and smoke penetrate more readily, the bacon acquiring a finer flavour. I should doubt bacon keeping well without the defensive rind.

In singeing a hog for BACON, the skin should be free from dirt. In London, and indeed wherever large quantities of bacon are made, the sides are preserved in pickle until wanted; but if so kept any great length of time, the salt corrodes and diminishes the flesh or lean: in the country-house, bacon is taken out of pickle as soon as perfectly cured, and hung up to dry, in which state it will keep any length, if in a moderate and even temperature, but it will be affected by alternate changes, and become rusty. Excess in the quantity of salt-petre will render the meat hard, and apt to disagree with weak stomachs. The solid flare, or internal fat, in a bacon hog, is expected to amount to 1 lb. per stone, upon the whole weight of the hog; but the tonky sort, which accumulate so much fat externally, have seldom so much within.

We heard great complaints last year, of the low price of barley, but the following instance will prove, that barley might really have been sold at a very high price in the shape of swine's flesh. A gentleman within twenty miles of London, had two in-pig sows sent him out of Herefordshire; they produced him twenty pigs, which were sold in autumn, being under ten months old, and in fleshy store state, at £5.2s.6d. each.

The NUMBER of OXEN and cows weekly exposed to

sale in Smithfield Market, is about 2,000 on an average, or full 100,000 annually: of SHEEP near 10,000 weekly, or 500,000 per year: of swine 300 weekly, or 15,000 in the year: of horses KILLED in London, weekly, between 4 and 500; in the environs, upwards of 100. The cruel sufferings and tortures of these last, during the latter period of their services, form an actual hell for minds of much sensibility; and for which there can be no remedy but a general improvement of morals, a consummation scarcely within the most distant hope.

Any minute particulars relative to the subject of swine, omitted here, will probably be found in The New Farmer's Calendar.

ON
 CATTLE MEDICINE:

PROPOSALS FOR ITS
 ESTABLISHMENT ON A RATIONAL FOUNDATION.

VIEW OF DISEASES AND REMEDIES.

Venienti occurrere—

Learn to PREVENT, rather than to CURE, Diseases.

I HAVE, both in the Treatise on Horses, and elsewhere, expatiated on the strange but well-known fact, that the medical care of our domestic animals has been, by custom, both of ancient and modern times, committed to persons devoid of education and science, in course totally unacquainted with the animal economy, and of the nature and operation of medicine. These men, learning by rote certain forms of prescription, either from tradition of their seniors and preceptors, or from some printed collection of equal authority, are at once qualified for the cure of all diseases, independently of the aid of experience, comparison, or reflection, of which too generally, and with few exceptions, their minds, from defect of due culture, must be altogether incapable. Although a custom like this, however absurd, extravagant, and dangerous, might be tolerated in former and less en-

lightened times, yet common sense seems strangely at fault that it should still subsist after the full advantage of long and mature experience, and with our stock of animals so immensely increased, both in number and value. The difficulty is farther enhanced by the consideration, that a veterinary college, sanctioned and supported by the state, and by public subscription, has been for some years established in the vicinity of the metropolis. It is then surely worth while to reiterate our inquiries, whether facts of the description do not evince the existence among us, of a considerable share of indolence and prejudice, and whether they be not prejudices of that kind, which require to be vigorously combatted by every friend of humanity and his country, as degrading to our high national character, and strongly in opposition to a most important national interest.

The indiscriminate encouragement given to QUACK MEDICINES and QUACK DOCTORS, is doubtless a capital branch of that tree of folly, the farther growth of which I am laying myself out to decry: and which, for the public safety, it is devoutly to be wished were levelled with the earth. Not however by authority of government, as some incautious persons contend, but by the good sense, conviction, and free-will of the people in their own case. Such a reform must yet be hopeless, whilst impediments of the nature of those described in p. 202 are still subsisting in full force. It is almost ludicrous, although it well may, and has so often had serious effects, that a learned education and liberal habits, do not always secure to their possessor, the faculty of judging in respect to the cure of diseases, in conformity to the obvious rules of natural logic and common sense; a faculty which the same individual may possess, in a supreme degree, on all other subjects. There seems a fatality in the case; and we have read

from the pen of a great and justly celebrated agriculturist, that he could not understand the veterinary writers. The declaration of such a man would almost lead us to decide, that the fault must rest with those writers. Under the influence of such examples, need we wonder that the middling, lower, and uninformed classes should be liable to similar errors, or should continue so long in subjection to them?

The matter is of public notoriety, that not only are the animals of persons of high consequence and first-rate information, doctored by the most ignorant and illiterate mechanics, but that even advertizing quacks, precisely upon a level with their brethren the doctors, first named, have been consulted by, and honoured with the confidence of men of rank, opulence, and talents. To avoid the repetition of ridiculous facts of this kind, and to give my readers an opportunity of judging of the real characters of quack-doctors, and of what may rationally be expected from their talents, honesty and capacity, I refer them to the Medical and Physical Journal, a periodical work of the highest respectability, and I have reason to believe of the most extensive circulation of any similar one, which has hitherto appeared in Europe; a journal, in which our British faculties of medicine and surgery exhibit themselves in a most distinguished light, for the unreserved openness and liberality with which they communicate their opinions and practice.

That some of our quacks have been acute judges of men and things, and of their own profession most particularly, the following well-known anecdote, which I think very probable to be authentic, may serve as a proof. The infallible Dr. Rock, who drove four, indeed I have heard six horses, about forty years since, when he resided on Ludgate Hill, was in the habit of dining at an ordinary in the neighbourhood, probably,

at Ashley's punch-house. A regular physician was usually of the party. This physician one day said to Rock,—“How is it, Doctor, that you who were never taught the practice of medicine, can obtain from it wherewith to keep an equipage, whilst I, who am a regular-bred physician, and have, through life, taken great pains to advance myself in my profession, can barely obtain butter to my bread, or a coat to my back? it will be an instance of friendship in you, to resolve me this.” Rock assured his brother the regular, that he had no objection, and that if the physician would breakfast with him the following morning, the difficulty should be at once solved. In the morning, the physician was introduced into a room next the street, to attend until Dr. Rock should have dismissed several patients, with whom he was then engaged. Afterwards, and during breakfast, they came to the business in hand. As a preliminary, Rock demanded of his guest, the number of persons he had seen passing the front-window, whilst he was waiting. To this strange question, the other could give no answer. Well—“how many do you think there might be?” “Indeed,” the reply was, “I cannot tell.” “But do you think there might be a hundred?” “Probably there might.” “Well, and how many men of sense do you really think there might be in the hundred passing by?” “On that head it is totally impossible for me to conjecture.” “But do you think the hundred really contained ten men of sense?” “It is not improbable, but it may have been in that proportion.” “See then,” rejoined the Quack, “a clear solution of your question, and make your advantage of it. *The ninety fools are my patients, and the ten men of sense consult you.*”

Would any of the noble or opulent patients of quacks, or employers of cattle-doctors, deign to con-

sult a barber, blacksmith, or cow-jobber, in matter of civil or ecclesiastical polity, merely on the score of such person being a natural born politician, and from his having been accustomed to read lectures on such subjects, to an audience at the village alehouse? No—such an idea would be spurned, as grossly senseless and ridiculous: yet where is the mighty difference between that, and the supposition, that persons of the above illiterate description can possibly be competent, or indeed possess any useful degree of intelligence in medicine or physics? A physician, in order to be able, and entitled to confidence in his profession, must have received a learned education, by virtue of which he may unfold, read, and digest the great volume of past and contemporary experience in various languages. He must have a deep insight into many sciences strictly connected with his profession. It is before all things necessary, that he be profoundly skilled in physiology, or the laws of animal nature and animal life; intimately and almost individually acquainted with the long catalogue of articles in medical use, their certain or anomalous effects on the animal body, dependent on time, place, or circumstance. In conjunction with these high and extraordinary qualifications, he ought to be in the habit of constant practical experience. But if all the above qualities are useless, if a medical new light continues to descend from above, on the favoured heads of those innocents, who are guiltless of all acquired science, that excepted, which teaches them barely to scrawl their name, what sums of money, and what a series of time, which might be so much more usefully employed, are absurdly lavished away and wasted on the education of our medical men!

It will be answered, that so much and such high science is not requisite, in treating the diseases of

brute animals, as in those of human patients; and that the former have ever been doctored by the description of persons, which I am stigmatizing for their ignorance. Most truly, animals have been, and still are doctored by such persons, and both the records of past, and the experience of present times have not failed to tell us *how*, which spares me the necessity of a repetition here. But granting there were not that strong connection which really subsists, in comparative anatomy, and that general analogy between human and veterinary medicine, the latter would the more require, on such very account, the superior light, power of discrimination, and exertion of regular medical men. Nor have eminent physicians, both of former times and in our own days, held it beneath the dignity of their profession to print their opinions and advice, on veterinary science: in that mode we may well hope a continuance of assistance from the higher order of the faculty; in the meanwhile, the active line of practice will safely devolve on the body of veterinary surgeons, now become somewhat numerous in this country, several of whom, by their publications, have evinced a most respectable share of professional information; a tribute which I am the more desirous to pay them, since I am not so fortunate as to agree with them in all points.

That so few persons have taken the pains to reflect, for a moment, on the nature of the quack medicine manufacture, obviously so simple and superficial, is a circumstance as wonderful, as it is favourable to the views of the venders of such articles. Are you in want of a medicine for sale, and have you the money wherewith to advertize it? The last is the grand point, and if you are qualified in that respect, the golden diploma, either with or without any other, will, at once, constitute you, Doctor auratus, and the govern-

ment stamp upon your medicines, invest you with a plenary authority to kill or cure, as chance, or your fortune may direct. To obtain the medicine is the simplest thing in the world. You have but to refer to a list of diseases in any of the monthly reports, and to fix upon one, or as many as your purse will accommodate with cures, of the most attracting, that is to say, of the most general and dangerous nature. Next you seek out some clever and adroit apothecary's apprentice, or journeyman, or mortar-beater, who, in consideration of a moderate fee, will turn over the pages of old Quincy, or of the New Edinburgh Pharmac., should his learning so far extend, and finding out one, two, or three supposed powerful specifics, he shall so knowingly combine, and so artfully disguise them, that you shall, in a trice, be put in possession of an infallible remedy, interesting, not only to yourself, but to the absolute safety of the whole human race. Just so, for as many diseases as you chuse to cure, and such has been the origin of many a celebrated specific. My readers may well wonder, that like a good priest, I do not practise as I preach, since it is so much more profitable to vend, than to write against quack medicines; but every man to his talent.

I have not forgotten, that certain very able medical men, excited by the usual great profits attendant upon that species of traffic, have become publishers of medicines; nor that such medicines, in a few instances, have proved really safe and efficacious: but patients ought to consider, that when they have purchased and obtained the best medicine, they have acquitted themselves of but half their duty, they stand equally in need of the prescriber's personal attention and skill in the application of it. Nothing is more probable, than for a man to mistake his own case, or to injure irrepa-

rably, as well as cure himself, with the most efficacious medicine. It is most true, that a quack, more particularly a water-doctor, may be consulted as to the patient's case, even at a great distance!—and so may a man who casts nativities, and turns the sieve and shears. Of advertised medicines, some have been found by analysis, to be compounded of the most potent articles of the *materia medica*, and the use of such, if long continued, may be of perilous consequence; others have proved to be no worse than innocent and pleasant bites, the perfumed and sugared loblolly with which children and fools are fattened. If a patient's case be desperate, and he be determined upon the essay of a desperate remedy, he will require, I should think, all the legitimate resolution, knowledge and skill, of an experienced physician. If I must needs be driven within an inch of a precipice, let me have a thorough-bred coachman, who has sat behind horses all his life.

In fine, it ought to be present to the mind of every man, that *the first intention in the sale of quack medicines, for the use either of man or beast, is to get money; the second may possibly be to cure diseases.* Under this caution who will may purchase. I am very sorry to have imposed upon me the necessity, of carrying still farther, the accusation of quackery; but the principle upon which I originally sat out, in this affair, and my duty to the public, which I am ever resolved faithfully to discharge, to the neglect of any private considerations, strenuously demand of me the whole truth, as far as I am apprized of it. I have yet already been made too sensible, both public and privately, of the offence which I have given to individuals of two parties, and am aware that all appeals to honesty of intention, are an aggravation of the case. With one party, were that possible, I should

be proud to agree; with respect to the other, or the faculty of leeches, horse and cow doctors, I most heartily wish them a more suitable and equally gainful livelihood.

The common mode with some men of this stamp, of great eminence and practice in the *doctoring* line, is, in addition to their list by rote or in MS. to obtain some grand specific, either from a book they may have occasionally laid hold of, or in the way already described; this, without probably knowing, or reflecting more on the nature and properties of the ingredients of which it is compounded, than the horse or cow that is destined to swallow it, they prescribe generally, with great éclat, and no less envy from their inferiors of the profession. We have been accustomed to see boasts in print, of the incredible efficacy and worth of these famous nostrums, which sometimes in the sequel, to our real astonishment, have been published for the national benefit. On this head I have not the smallest apprehension of committing myself, I have been in the habit of knowing such things, in other modes, beside seeing them in print.

To proceed to books: I have never yet seen any of these *cattle or cow-doctoring books* which appeared to me to be written *bonâ fide*. Well-intentioned ignorance, if not entitled to respect, is at least venial; but the slightest examination of most of these printed guardians of the health of cattle, by a person qualified to judge, will evince, that they are premeditated impostures, goods merely vamped up for sale. They have either the names of living men tacked to them, who, in the strongest probability, never either did, or could write a line of them, or they are published in the name of some one of the mighty dead, among cow-doctors, who most unfortunately died at last, after

sixty years practice ! One would expect to find something original and valuable from this long-continued and extensive practice ; but the disappointment is always complete. The chief of that which we meet with, consists of transcriptions from former writers, interlarded with learned medical and physical dissertations, perhaps sound and good enough in their place, to which are loosely and clumsily tacked, the most nonsensical and burlesque appendages by Mr. Editor. The medicinal forms in these books, are frequently the strangest jumble that imagination can conceive. Articles of a directly opposite nature and intention, are blended in one mass, which must inevitably act upon the animal system, with an effect similar to that of two men pulling at opposite ends of a cord. We find Balsam of Peru and Glauber's salts married together, the intent of which, no doubt, must be, as a Suffolk farrier once described to the late Mr. Rush, " a kind of a heater and a kind of a cooler." Indeed the far greater number of the prescriptions wear rather the appearance of having been fabricated for the use of the book, than of having ever been used and approved in real practice. One truly laughable custom was introduced by the book published under the name of Topham, and has since been regularly followed by another doctor, who made a new book out of Topham's old one. It was, to subjoin to every prescription of note, a set character, conceived in the most high-sounding terms of panegyric, at the same time, with a choice of words, at once so droll and so gravely professional, with so formal an arrangement, that he must be a man far surpassing me in gravity, grave as I naturally am, who can peruse them without bursting into laughter. It is a strange and burlesque association, but this circumstance at first put me in mind of Hume's summing up the character of the king at the

conclusion of each reign. Perhaps Mr. Topham's editor had read Hume, and was ambitious to rival the great philosophic historian in drawing characters.

It must not be denied, however, that these books contain a number of useful hints, relative to the management and dieting of cattle, whether or not, such may have originated with the *doctor*, or have been introduced by the editor. They may also, to a certain degree, be consulted as to the symptoms of diseases, although by no means to be implicitly relied on even in that respect. So far they have their use. With regard to doctoring, as it is termed, or prescribing medicines to cattle, they are most truly blind guides, and when unfortunately, they are set to lead the blind, the fate of both parties may be very readily anticipated. I am speaking of books, which have been published within the last half century. As to the ancient veterinary writers, none of them, not even the celebrated Vegetius, were medical men, and their medical practice is utterly beneath modern notice. The same kind of books of our old English writers, consist of a strange medley of ancient practice, with various sage additions of their own. A rational man cannot read over some of their prescriptions, without amazement, nor a humane one, without extreme pity for the harassed victim of such monstrous practice. By the way, they, who for interested purposes, fabricate pretended cattle medicines, of the effects of which they are careless or ignorant, commit an act of gross inhumanity and crime, in too probably adding to the load of sufferings of a helpless animal already tortured by disease. One of the greatest curiosities we meet with in the old books, is their grand universal specific. It seems as though they judged by a kind of compound, arithmetico-medical logic, that all medicines being commixed and multi-

plied one into the other, the product must necessarily be a specific for the prevention or cure of all diseases!

Somewhat more than fourscore years since, the great opprobrium of depending on the writings and practice of the ignorant and illiterate in the diseases of animals, at least the necessity of it, was removed, with respect to horses, the most important species, by William Gibson, an army surgeon, of whom in vol. i. *Treatise on Horses*, I have given the few particulars I could collect together, with an impartial character of his writings. Dr. Bracken, a pupil of Boerhaave, and a physician at Lancaster, within a few years afterwards, followed Gibson in the same course. Within thirty years after the appearance of Bracken's books, William Osmer, a surgeon and a sportsman, published the improved method of shoeing horses of the French veterinary schools, in itself, totally useless and impracticable here, but rendered of that excellent use which we at this day find it, by the experienced and judicious Osmer's improvements. Gibson and Bracken established their veterinary system on the analogy of human medicine (marking certain anomalies) which analogy they had confirmed by a thorough knowledge of the horse, resulting from long practical experience. They particularly adverted to "*the horizontal position of the horse as contrasted with the upright form of man.*" The best veterinary practice of this country has arisen from their institutes, which form a very sufficient foundation on which to raise a fair superstructure of general veterinary improvement. The only errors of consequence, hitherto discovered in their writings, are a too diffuse and redundant prescription of medicines, the common error of their times, easily remedied by the modern practitioner, and of the less import, since their chief articles were so judiciously chosen, as to be, at this instant, in

common use, either actually, or under the cover of *succedanea*. The same may be averred as to their doctrines or principles, and general practice, notwithstanding certain exceptions, in which our superior light has at no rate been hitherto established. In one most important particular, I fear we have retrograded of late years; I mean, by the adoption of that groundless continental hypothesis of the inelasticity or immobility of tendons, which has been carried to such a systematizing height by our late veterinary writers, as almost unreservedly to deny the possibility of fibrous relaxation, as a medium of debility: the consequence of such unphysiological ideas has been, that the tendinous, and ligamentary lameness in the legs of horses are supposed to be confined merely to inflammation and tension, and the whole cure to consist in the simple reduction of those, an error which is every day leading to the most fatal consequences. On this interesting topic I have said as much as my experience would warrant, in the *Treatise on Horses*, vol. ii. p. 565, second edition.

It has been objected to me, in a late publication, that Gibson and Bracken are my *favourite* authors. I freely acknowledge as much, and without having, I trust, the smallest occasion to be ashamed of my motives, the chief of which are, that these good old authors have written with good faith towards the public, and as independently as possible of private, and entirely so, of party or system-monging ends. The farriers or veterinary dispensatories, or pharmacopœias, of Gibson and others, are obviously the least valuable of their works, since the general pharmacopœias must answer the end, in a far more comprehensive and equally convenient way, to such persons as can possibly receive any benefit from publications of the kind.

We cannot sufficiently regret, that those authors, who established so excellent a veterinary system for horses, exclusively, had not been excited and encouraged to proceed, and to extend their practice to our other domestic animals, in which case, we should not have been so egregiously at a loss, as we have since been, and as we, at this moment, unfortunately continue. Be it our present business to remedy this defect; towards which end I beg leave to contribute my mite, in the following propositions.

Three or four years since, a respectable member of the London Philosophical Society, W. P. Whyte, Esq. presented the public with the outlines of a plan of this nature, (see Nicholson's Philosophical Journal, &c.) which I understand has not been hitherto pursued, and with which, my ideas, if acted upon, would at no rate interfere. To the influence of our agricultural societies, and of eminent individual cultivators, now happily so numerous in the country, we are chiefly indebted for the late diffusion of the various improvements in cultivation and the care of live stock. My proposal is simply, that the affair of providing the country with regular-bred surgeons, for the practice of cattle medicine, be immediately undertaken by the agricultural societies; at least, that the experiment be made by some of the most considerable, each society engaging a gentleman of that description, at a sufficient and respectable annual stipend. The contract may run in such form, that should the surgeon's annual emolument from practice, come short of the stipulated sum, the deficiency should annually be made good by his patrons the Society. No person to be engaged on any pretence, but who shall have received the usual education of a surgeon, and have attended the hospitals the usual length of time. A selection of VETERINARY TEXT-BOOKS to be made, and the books purchased for

the use of the surgeon, but to remain the property of the Society. This may consist of Gibson's last edition, 2 vols. Bracken, Bartlett, Osmer, Layard, with our late writers; and La Fosse and Bourgelat from the French, with whatever may have been published since their time, by authority of the French veterinary schools. All the members of the society and their connections, as far as their influence may extend, to entrust the care of their diseased animals to the surgeon appointed, at a fair and liberal charge for his attendance and medicines. The surgeon to keep a regular history of all the cases which shall come under his inspection, including the presumed causes and symptoms of the disease, with the probable methods of prevention; his mode of treatment, a particular detail of the medicines prescribed, their operation, with every relative and useful remark which may occur. A clear, written copy of such veterinary transactions, to be delivered annually, and on a certain day, to the society, to remain at their disposal.

This plan I humbly conceive, if executed on a tolerably extensive scale, and by men of a respectable share of ability in their profession, would in the course of a very few years, leave us perfectly at ease, as to a knowledge of the diseases of our oxen, sheep and swine; a knowledge, which the whole experience of my life serves to convince me, is utterly unattainable, otherwise than by the practical efforts of regular medical men. An interchange of communications on this subject, by distant societies, would have the excellent effect of developing local variations of disease or constitution, and of affording the materials of a practical veterinary system of the most useful and comprehensive nature. How the expence of a plan like this might accord with the rules prescribed to themselves, by societies or individuals, I am not aware.

I can only say, that if there be a thing of great and commanding necessity, they who can afford the funds, will ever find it a convenient and ultimately advantageous measure, so to do, and not with a thriftless and ill-judged parsimony, to spare them. The nature of this plan does not admit of its being made a job, or a sinecure, as the conduct of the surgeon will come under the annual inspection of the country, and of his immediate employers. His situation may also be the mean of introducing him to a considerable share of practice in his usual line.

In my former work, I made various proposals of this kind, with the view of putting the direction, at least, of veterinary practice, into better hands. I proposed that the country surgeons should act as physicians and counsellors to the cow-leeches and farriers. I farther advised very considerable proprietors of horses, to engage a veterinary surgeon by the year, at a fixed sum, since the preventive care of such an assistant, may not only be a vast saving of expence, but must have the good effect of relieving the mind from a constant load of anxiety, in a matter so precarious as the well doing of horses. Certain very great and respectable proprietors of horses, subscribers to my work, have since, I understand, adopted this mode with a satisfactory degree of success.

As a regular medical man alone can possibly be qualified for the cure of diseases in our domestic animals, so all experience proves the analogy between their diseases and ours, to be so close, as to require, with little other variation, than in quantity, the same classes and species of medicines, and a perfectly corresponding medical care. We have but to make due allowance for their prone or horizontal position, their superior bulk and substance, thickness of integument, more simple aliment, and habits of constant exposure

to the external air, and we have advanced a considerable way, in adjusting the difference between the brute and human body, both of which are composed of the same elements, and governed by the same general laws of physiology. Mr. Chenevix (Philos. Transac.) found the humours of the sheep's eye, nothing different from those of the human eye, and that those of oxen contained the same substance as the respective humours of other eyes. The horse, the ox, and the sheep, are liable to many of those diseases, with which human nature is afflicted, and in their other maladies, which do not appear to be quite analogous, there is still an apparent, if a remote consanguinity. At the same time, we find all the grand medical remedies, mercurial preparations, antimonials, sulphur, nitre, aromatics, alcohol or spirits, wine, beer, aloes, bark, opium, to have a certain and proportional effect on our animal patients. The same may be said of salves, plaisters, and external medicaments of the more powerful kind. In short, to the circumstance of animal medicine having been hitherto almost solely in the hands of those who were ignorant of the human, it is to be attributed, that the analogy, close as it is, has so long remained undiscovered. The real diseases of cattle have laid hid, under a vague and barbarous nomenclature and symptomatology, that no man of sense can analyse, construe or appropriate. The desideratum, the only medium of improvement, is to introduce, as nearly as may be, an analogical nomenclature and pathology into animal medicine; it will go to render it that which it ought to be, a common science with medical men.

Some rather pleasant attempts have been made, to controvert the existence of that analogy of which I am speaking, by quoting two or three instances, where, in the opinion of the writer, it had failed. As though

we expected general rules absolute, and without the usual condition imposed by nature. I say pleasant attempts, because they are liable to be suspected, as made in the monopolizing spirit. Arsenic and white vitriol are unfortunately introduced, in proof of defective analogy, because, although the one is a deadly poison, and the other a strong emetic in a small dose, in the human system, they may be both given to horses in large doses, without any violent effect. But previously to this observation, it should have been known and allowed, that both arsenic and vitriol, the latter in considerable doses, are used as tonics, in human medicine: indeed those articles are far enough from being recently discovered veterinary remedies, having been tried unsuccessfully, and I believe fatally, on glandered horses, together with verdigrease, many years ago. Emetic tartar had also a great run among some of the London farriers thirty or forty years since, but did not retain its reputation. A gentleman's horse in Piccadilly was said to have been killed by a too large dose of it. At any rate, the above anomalies are introduced more than one hundred years too late, to come in the shape of new discoveries; according to an old author, now open before me, arsenic, which is fatal to man, only purges a wolf.

The establishment of a veterinary college has had the very useful effect of turning the attention of a far greater number than formerly, of medical men, to veterinary inquiries and pursuits, and, in a great measure, to wipe away that false sense of shame, which many gentlemen of the faculty entertained, at the idea of becoming horse and cow-doctors, a most groundless prejudice, in any view, particularly, when it is considered, that men of the first rank and fortune in the country, think it no degradation, but an useful and patriotic employment, to obtain personal and

practical skill in the management of live stock. In other respects, and according to the view which I have given of the subject, no medical man need be at all backward or apprehensive as to his ability in any veterinary undertaking. In the case of horses, he will find very full and sufficient guides, in those original treatises which I have recommended, and in many others of later date, by a collation of which he will be enabled to judge of the degree of subsequent improvement, and of what may remain for himself, and other succeeding improvers to effect. For a knowledge of the nature, habits and practical management of animals, a most material branch, with the clearest accounts I am able to afford, or collect of the diseases of horned cattle particularly, I beg leave to refer to my own labours. The common method of handling and managing diseased animals, in order to any operation necessary to their cure, is easily acquired, and becomes familiar by observation; and neither opportunities nor dead subjects can be wanting, in a country where so many animals are consumed, for the purpose of demonstration and improvement in the sciences of zootomy and zoophysiology, or the anatomy and physiology of beasts.

The faculty of cattle-doctors, I shall hope, may be considerably improved by the addition and presence among them, of a number of regular professional men, in various parts of the country; indeed whatever turn improvement may take, the former must be generally depended upon for a length of time. And in remote and secluded parts of the country, where even the lowest practitioners are not to be found, it inevitably results, that the proprietor or his servants must fill the office of doctor to the flocks and herds. By what I have already said on that head, and on the extreme uncertainty of all *receipts*, with the probability of

their misapplication, my readers in this predicament will not find me disposed to flatter them on their prospects of success. There is only one view, in which I can give them hopes, but those are of the most brilliant kind, and well worth their utmost attempts to encourage; I mean the hopes, or rather complete certainty of success, from the INFALLIBLE RECEIPT OF PREVENTION, singly worth more than all the infallible cordials and medicines ever advertised. It should be considered, that animals living in a state of nature, regulated by the reason and experience of man, would be almost exempt from disease. That their appetites, unlike our own, may be held under a constant controul. That their diseases result purely, even in the case of hereditary defects, from the negligence or erroneous treatment of their owners. They are either exposed too much to the rigours and changes of the weather, or they are gorged with food, denied a sufficient quantity, or supplied with such as is unwholesome. Here we have the chief causes of their maladies—LEARN TO PREVENT THEN, instead of undertaking the tedious, unsuitable, and hopeless task of learning to cure them. Of all things, let the proprietors of cattle renounce for ever the insane folly, of offering premiums for specifics to cure incurable diseases! and the hope of providing medicines, which, by a miraculous operation, will enable men to continue in the habit of exposing their animals to the constant risk of such diseases: for example, sheep in those situations, which nature has decreed shall for ever rot them. Prevention of disease is alone a grand improvement of the breed. It is a great profit; for in case of general disease in a flock or herd, we are not only to reckon the loss of those individuals which die, with the doctor's bill, and our own and servants time and attendance, but the loss of time and thrift in the

survivors, sometimes the heaviest loss. The constant attendance upon half a dozen such animals forms an object, as it respects the expence of time and labour, and on account of the solicitude it occasions; and if the necessary curative measures are imperfectly executed, nine times out of ten the case, the ailments of the animals had far better be healed at once *by the first intention*. Again, when half a dozen only are selected for cure, many times double the number may yet remain, in nearly as bad a state: what a situation then must a farmer be in, with some scores of patients to doctor, the convalescence of the greater part of which, the most he can hope for, affording him very slender expectations of future improvement, adding the sudden fatal termination of disease, so common in cattle. Surely these are substantial arguments in favour of foresight, inspection, provision, in preference to an indolent and implicit reliance on doctoring and receipts. Reckoning all this, and much more which might be suggested, that cost must be large indeed, which preventive care will not repay.

My admonitions on the above topic have been too ample, I fear, not to be tedious. I proceed now to diseases and their remedies, but I have no infallible receipts to offer, on the contrary, I wish to impress my readers strongly with the idea, that *all infallible receipts are infallible nonsense*. In this latter department, of a description of diseases, and of providing them with remedies, I have acted to the best of my abilities, both from my own observation and practice, and what I could collect from others; but I will freely own, it is not in my power to be of equal use, in this respect, as in that of general advice on management and prevention; nor, I believe, in the present state of animal medicine, horses being excepted, in the power of any other individual. If I cannot serve the public

so effectually as I could wish, at least, I will not deceive or mislead the public.

Upon every farm, it is truly necessary to the well-being of the cattle maintained, that there be houses or sheds, sheltered yards, and spare inclosures, for the comfortable reception of the diseased. The want of such conveniences, or an indolent prejudice against the use of them, is in itself a real malady, and one great cause why slight affections grow into incurable or endemic diseases. The proper instruments of administration or operation, should also be provided, and always ready for use; and where much cattle is kept, it would be of considerable benefit to set apart a piece of garden-ground for the production of medicinal herbs, febrifugal, restorative, vulnerary, &c.; for although these botanical simples are justly rated by modern practice, far below their ancient character, yet infusions or decoctions of them are excellent vehicles in cattle medicine for articles of superior efficacy, and in fact, as I have often experienced, some of them possess, in a considerable degree, the virtues attributed to them.

It is much to be lamented, that there is considerable difficulty in obtaining genuine drugs for the use of cattle, one great source of failure in cures. Yet very expensive articles, however efficacious they may be supposed, cannot be afforded, since the expense of cure might amount to more than the worth of the animal. This points to discretion in the choice of medicines, some of which are both efficacious and cheap. It is of importance too to recommend articles the most easily attainable. As to the strange names of the diseases, I have endeavoured to provide them a meaning, wherever I could find one for them.

OXEN, COWS, AND CALVES.

FEVERS. The fevers of these animals, whether original or symptomatic, correspond to a sufficient degree of exactness, for medical purposes, with those of the same type in the human species. Cattle are, according to common observation, subject to mild and inflammatory fever, from over-exertion in labour, or from the stimulus of affright, in being hunted and harassed about, beyond their powers: also to catarrhal, influenzal, pneumonic and puerperal fever; to contagious fever or MURRAIN, a fever attended with buboes, and bearing a considerable similitude, in cause and effects, to the plague in the human species. The diseases of the males of the species, are generally of the sthenic, or robust kind, but the females, from the constant exhaustion of milking, not unusually with very poor and innutritious provender, are subject to atonic disease, and I have often remarked the appearance of perfect hysteric irritability in cows.

The books of two of the cattle doctors to which I have before adverted, set out with a wonderful account of the "frenzy, or inflammation of the brain, commonly called the SOUGH." A strange distinction is made between a "true frenzy and a symptomatic frenzy." The earliest writer (Topham) says, "I have known an inflammation fixed for some time in the jaws, there producing a roughness, mounting up in the head; this often creates a mortal frenzy." It is curious that the GARGYSE of the old writers, is the very reverse of this in its course, being "a swelling under the eye like a botch or boil, which, if it reach

the lips, is incurable." Topham's copyist repeats the very words. What dependance may be placed on the existence of such a symptom, I am unable to say, but have strong doubts on the matter; without any doubt however, of the impropriety, of the spirituous and stimulant composition immediately advised in Topham's book. They afterwards very properly order the neutral salts, with copious bleeding in the jugular vein, from a large orifice. Common prudence would dictate the slaughter of a beast in such a state, as they have represented, but should circumstances render it desirable to attempt a cure, and the beast be manageable, a doubtful thing, I should conceive in a frenzy, he must be confined in a well-littered house or shed, where he may still have benefit of fresh air. Bleed from two quarts to a gallon, repeating at proper intervals, until the inflammation be assuaged. If the animal will drink, give pails of warm water, in which have been dissolved several ounces of nitre; or twice or thrice a day, drinks of nitre and cremor-tartar, or two drachms of tartar emetic may be given several times a day, a medicine much recommended of late, and which is said to act with similar effects to Dr. James's powder. If needful his body must be kept open by purges or clysters. Should mortification be apprehended, the animal powers must be supported by cordial medicines. Forms with these several intents, will occur hereafter. Setons or blisters may be useful in this case.

COLDS. EPIDEMIC Colds or INFLUENZA. The common symptoms of catarrh or cold, are too well known to need description, but on account of the inconvenience of nursing a number of animals, those affected with colds, are generally left at large, to the efforts of nature. In many the symptoms are only suppressed, and the disease is thrown upon some bowel, to re-

appear under a new name, nor is it suspected what a number of diseases take their rise from exposure to the changes of the air. Cattle which have thus suffered will have weeping eyes, hot breath, a rough coat, and appear hollow in the flanks. As in this state they will at best but remain stationary, it is preferable to draw them as soon as their case is discovered, and allow them dry meat in a warm and sheltered place, which may prevent the access of any dangerous disease. The influenza or epidemic cold arises from frequent changes of the air, and the prevalence of north-east and easterly winds. As a great number, whether of men or animals, may be seized with this species of catarrh at the same time, and from the same cause, it has been supposed contagious, which indeed may probably be the case, in its inveterate and putrid state. This disorder is most prevalent in the spring which succeeds a mild winter, when particular care should be taken that cattle are not exposed to currents of air from the north-east. I have known a whole fold-yard of oxen, horses and cows, dangerously affected in one night.

DRINK for a beast which has taken cold, and obliged in consequence to be housed. If the animal shivers with cold, and has cold breath, give a quart of warm ale, in which are infused a table-spoonful of grated ginger, two of spirit of hartshorn, and one of laudanum, repeating it in six hours, if the chilly symptoms continue, allowing warm water and a deep bed of straw. If feverish heat comes on, give nitre in the warm water: when fever becomes predominant, bleed two quarts, unless the animal be a milch-cow, which never ought to be bled, but on extreme necessity, and give two ounces of nitre, and one ounce of cre-mor-tartar, in three pints of warm gruel sweetened with treacle or honey. On recovery of the beast, ac-

custom it to the air by degrees, and notwithstanding having been nursed in the house, it will again become equally hardy as before.

PERIPNEUMONY, PLEURISY, INFLAMMATION OF THE LUNGS. Symptoms:—dry painful cough, hot breath, laborious respiration, sometimes ropy discharge from the mouth, the hide feels harsh, constringed and burning hot. This is another variety of disease from suppressed perspiration, generally occurring in the autumn or early spring, in hilly or exposed situations, on a sudden change from heat to cold, or during a long continuance of north-east winds. Occasionally this disease terminates at once fatally, and I have heard instances of a beast seized with inflammation of the lungs, and dead in twelve hours. The cure consists as before, in bleeding and cooling medicines, administered in the house, where the animal may be kept from the weather, the original cause of the disease. Topham advises, in case of violent inflammation, to bleed instantly and plentifully, from both sides of the neck, a practice which I observe, has been successfully adopted by several of our veterinary surgeons: but the animal must not be reduced too low by profuse bleeding, in which case, setting aside the immediate danger, his recovery and after improvement cannot be depended on. For emollient drink in case of cough and soreness of the breast, purge, &c. see end of the section.

I have already noticed tartar emetic, or tartarized antimony, as a fashionable medicine in fever at present, but I ought to state, that I had formerly an opportunity of seeing it repeatedly tried, without effect, in inflammation of the lungs in hogs, which probably might be an accidental failure, since, from its composition of tartar and antimony, it ought to be specific in such cases. At the same time, I saw

repeated instances of the success of those fever-powders, which Bartlet's writings brought so much into vogue with the farriers. Of these, Schwanberg's powder was, I believe, most in use. It was thus made—One pound of common antimony heated until near fusion, or melting, in an earthen vessel, over a very brisk fire, when one quarter pound shavings of hartshorn is put in, by little at a time, keeping the mass constantly stirring; in a short time after this, the process is finished, and when cool an ash-coloured powder is produced. Bartlet recommended the addition of tartar emetic, or calcined mercury. Probably in the addition of a scruple of calcined mercury to two drachms of the above powder, for one dose, we should obtain a cheap fever powder, equal in all respects, to that of James. I neglected to make notes of the circumstance, but I have some obscure recollection of the good effects of the antimonial beer recommended also by Bartlet. Take glass of antimony finely powdered eight ounces, strong beer one gallon, infuse together in a stone bottle a fortnight, shaking well every day. Dose half a pint to a pint twice a day. This medicine may make a good substitute for antimonial wine, and render great service in the fevers of cattle attended with great debility.

HOOSE OR CHRONIC COUGH in Cows, usually from cold caught in calving. There seems no remedy for this, but patience and warm lodging, throughout winter, unless the owner would choose to try a daily drench of a quart of warm ale, in which are infused an ounce of tar, an ounce of anniseed in powder, or cordial ball, and an ounce of vinegar of squills, the whole sweetened with honey. This must be continued, at least, several weeks, to do any effectual service. RHEUMATISM, of which I have seen very bad cases, in cows, seems to me to admit of no remedy,

but warm keeping, and perhaps steeping the legs in warm water for a length of time together. CONVULSIONS or trembling from cold wind, &c. Keep the beast warm, and even clothed, giving warm ale with cordial ball infused, and volatile alkali, or spirit of hartshorn.

The **YELLOWs**. This disease in cattle usually originates in hepatic, or liver-obstruction from cold; however, always from obstruction, which is most effectually opened by mild mercurial purges, notwithstanding the beast may appear weak and hide-bound. The yellow tinge in the eyes and mouth, and upon the urine, sufficiently indicate the disease. Take the patient to the house, the earlier the better, and if he remain weak after two or three purges, give steel-beer, milk-warm, a pint twice a day for a week, and good keep. One gallon good beer, three or four ounces iron-filings, infuse in a stone bottle corked up three or four days, shake daily. Hard labour during great heats was said by the old writers to produce the **GALL** or **OVERFLOW** of the **GALL**, which often terminated in the **Yellow**s. The **PANTAS** or **PANTASIE** is a species of intermittent or ague, produced either by the feverish heat of the dog-days, or by sudden cold. Symptoms:—trembling, panting and working of the flanks. Beast to be taken home and treated as in colds. Long-continued and neglected **CATARRH** will produce specific glanders, both in oxen and sheep.

MURRAIN or **PEST**. These terms correspond with that of the Plague, in the human species, and the diseases have a similar origin, namely in putrid *miasmata*, or vapours inspired or drawn into the noses and mouths of animals, which animals being infected, acquire the power of infecting others with their breath or perspiration. The regular exit of the disease is in the eruption of suppurating boils or buboes, and the

care of the physician is to prevent a fatal result the while, from mortification. This disease has visited both men and cattle, periodically, from the earliest antiquity, but more frequently, and with a higher degree of virulence, in hot than in cold or moderate climates such as our own, where we have well-founded hopes, that its fatal effects may be mitigated and reduced within narrow bounds, by proper and timely precautions, upon any future alarm. It is consolatory to reflect, that the poisonous effluvia from an infected animal do not probably possess the power of re-infection, beyond the distance of a few yards, whence the security of separation. The plague of horned cattle, or oxen, is said to be peculiar, and not communicable to other animals. Dr. Layard affirms, he has seen sheep, hogs, young pigs, horses and dogs in the midst of the infection, without being in the least affected by it, nor does it appear that infection, or even injury to health, has resulted from eating the flesh of infected animals, on which head there need be no anxiety or alarm. Yet in a contagious disposition of the air, it may chance, that various species of animals be affected at the same time. According to Layard, the several stages, the progress and effects of this contagious distemper in cattle, are exactly the same with those observed in the human small-pox.

SYMPTOMS, from the actual observation of the same author:—All not equally affected, the infection differing in degree, slight or violent. Infection first denoted by a decrease of appetite; poking out of the neck from difficulty of deglutition or swallowing, shaking the head, hanging down of the ears and deafness; dullness of the eyes, moving about, restless. About the fourth day, stupidity and unwillingness to move, great debility, total loss of appetite, running

at eyes and nose, sickness, throwing up bile, husky cough, shivering. Head, horns, and breath very hot, body and limbs cold. Fever continual first three days, now rises and increases towards evening; pulse quick, contracted, uneven. Constant *diarrhæa*, or scouring of foetid, green dung, stinking breath, nauseous steams from the skin, infecting the surrounding air. Blood florid, hot, frothy. Urine high-coloured. Roofs of the mouths and the barbs ulcerated. Tumours, or boils, are felt under the fleshy membrane of the skin; eruptions all along the limbs, and about the bags of the cows. Milk dries up suddenly, purging more violent. Passage excoriated, or fretted by the acrimony of the dung. Groan much, worse towards evening, mostly lying down. These symptoms continue increasing until the seventh day, on which generally, although sometimes protracted to the ninth, the crisis, or turn, takes place.

Every fever which is putrid, infectious, and epidemic, may be with propriety termed a pest or plague. All diseases capable of producing putrid effluvia, in a certain stage, or of a certain degree of strength, may become contagious, which, I apprehend, settles the point with respect to the late influenza, not contagious perhaps, merely because in few or no instances, had the disease attained that exalted degree of putridity requisite to such end; reasoning on this principle, and running over the various accounts of epizootics or cattle-murrain upon the continent, to those in our country from 1744 to 1770, most of which I find traced by their historians to insalubrious atmospheric changes, I feel much disposed to identify such diseases with the most exalted or confirmed degree of catarrhal influenza. Previously to an account of the epizootic in Hungary, in 1712, it is remarked, "that the spring had been rainy, with great changes in the

temperature of the atmosphere; for on the same day the morning was cold, and the middle of the day very warm; the cold began again about three o'clock, and the evening became warm." Individual animals, one after another, are seized with the disease from contagion of the air, or perhaps a whole herd at nearly the same instant: yet it is generally, and almost ever erroneously supposed, that the infection has been introduced from without, by some new comer among the stock, or other similar means, the contagious state of the air being totally overlooked. On the other hand, some persons refining upon that argument, have denied *in toto* the power of contagion in the disease, an evident and dangerous error, since both theory and experience have sufficiently evinced the infectious and penetrating power of putrid miasmata. Thus under a contagious state of the atmosphere, infection will take place primarily, and re-infection amongst the animals from delay and the great difficulty of timely separation, and the plague may have a rapid and extensive spread; but the danger however great, is obviously by no means equal, when the infection is simply introduced from without, by a small number of infected animals, or in the envelope of skins, fleeces or goods.

The distemper which prevailed in 1744 and 1745 was supposed to have been imported from Holland, doubtless because it was known, that an epizootic had raged in the cattle countries upon the continent; but it was not considered that the same contagious state of the atmosphere might, in turn, prevail here, and produce similar effects, a more probable and efficient cause than the importation of a few calves, not one of which was, that I can discover, ever proved to have been infected: nor is any thing more common, than for people totally to overlook atmospheric

alternations, however frequent and affecting, even whilst themselves, their animals and the fruits of the earth are suffering severely from their morbid effects. At that period particularly, many persons either saved their whole stock of cattle, or escaped with very small loss, by merely housing them safe from the inclemency of the air, whilst those left abroad were universally liable to the contagion. This may be seen in Dr. Barker's pamphlet, and in various communications on the subject, to the Gentleman's Magazine of that date. Great mischiefs have ever happened in these seasons of calamity, from variety and distraction of opinion and advice, and from the folly of cattle-owners, running after ignorant pretenders and conjurers, and seeking *cheap* specifics which are to cure the disease at once, without loss of time or hindrance of business, instead of allowing time for the consultation and operations of grave and capable professional men.

In any future epizootic, the country will doubtless enjoy a signal and unprecedented advantage, in the circumstance of veterinary medicine having now become a familiar study, with so considerable a number of the regular faculty: and if I presume to give any advice on a question so beset with real difficulties, I beg to be acquitted of presumption, and to have it understood, that I offer my opinion subject to the correction of maturer judgments. I have formerly repeated Dr. Darwin's proposal, to slaughter all the cattle within five miles of an infected place, a proceeding which, on farther consideration, I think needlessly harsh, and recommended perhaps from a view of the matter not quite correct. It would probably be sufficient, on appearance of the distemper, to place the whole herd under the best shelter that circumstances might allow, since to view the matter gene-

rally, and without reference to contagion, a state of disease, and the demand of medical care, must ever indicate a necessity of withdrawing the patients from the chills and variations of the external air, more especially by night. The next consideration is to select and separate those which are in the most advanced stage of the disease, and forthwith to slaughter such as have been declared by proper authority, to be in a state too dangerous for any attempt at cure, the carcasses to be buried at a sufficient depth. Dr. Layard seems to be our only practical guide, as to the treatment of those, on which a cure may be attempted. In a disease so highly putrid, it is obvious, that bleeding must be moderate, yet in the beginning it will be generally necessary, as also setons and rowels. If costiveness prevail, the body must be kept open by clysters, or the most moderate purges, but a scowering is the more usual symptom. The sick-house must be sufficiently airy, yet well defended from wet and cold. Acid fumigations will purify the atmosphere of the house, and probably, the fumes being inhaled by the beasts, may have a favourable effect. As a substitute for these, or until they can be obtained, the burning of green boughs with a quantity of pitch may be practised. The hides of the beasts may be clean washed with a ley of soap and wood-ashes, rubbed and curried; and oily frictions may be afterwards tried, which, it is said, will powerfully open the emunctories. It has occurred to me, that the following drink might be generally useful in the cure. Infuse in a gallon of strong decoction of broad leaved, or any willow-bark, or of sage, rue, rosemary, &c. eight ounces of nitre, two quarts distilled, or the best vinegar, and one pint of brandy, with or without half an ounce of opium, against which perhaps objections may be brought. Sweeten with honey or treacle, and

give one pint to a full-grown beast, three or four times a day. Pollard mashes and good hay will be needful. The approach of gangrene must be resisted by bark, oak-bark, if the Peruvian cannot be afforded, opium, myrrh, perhaps nitre, and sound strong beer. But the exhibition of these requires both medical skill and veterinary knowledge, particularly an attention to the feelings of the animals, and great discrimination as to the effect of the medicines, a thing unfortunately seldom attended to in drenching cattle. The *emphysema*, windy abscess, or puffing up of the hide, filled with a thin, putrid matter and foul air, which nature furnishes in the last stage, as a mean of throwing off the disease, must be opened at full length, wherever situated, and the matter discharged. The cavity to be filled with pledgets of tow dipped in tincture of myrrh, or of an ointment composed of powdered turpentine, and yolk of eggs. Poultices of oatmeal, stale beer, &c. may be necessary to bring the ulcer to a proper digestion. Nitre has, of late, been successfully used in gangrenous ulcers, the cavities being filled with it. The approach of mortification is indicated by the dark and flabby appearance of the inside of the mouth, coldness, insensibility, blackness and ill scent of the dung, sanious and foul discharge from the mouth and nose, and dulness of the eyes. On the return of health, mild cleansing purges will be necessary, but the danger of mortification must be clearly passed, before purges be ventured. The recovered beasts must not be suddenly exposed to the air, but only turned out a few hours in the middle of the day, particularly throughout winter. Sudden exposure has subjected many convalescents to a vertigo or giddiness, and to consumption. During the reign of the distemper inoculation was tried both in Hol-

land and in this country, but with no decisive event. All the usual precautions of washing with strong ley, painting, tarring and fumigation to be religiously observed after an infectious disease.

SHEWT OF BLOOD--VOMIT OF BLOOD--BLOOD IN THE BACK--BLOOD IN THE LEGS OR CRATEUCH--BLANE IN THE TONGUE OR OVERFLOW OF BLOOD--STRIKING IN OR RISING OF THE BLOOD--HIGHAM OR IRON STRIKING--JOINT MURRAIN OR GARGET--BLACK QUARTER--QUARTER-EVIL--BLACK LEG. I feel almost inclined to introduce the regular *alias*, since the above names all indicate the same disease in different stages. All our animals, oxen, sheep, and pigs, I have observed are subject to sanguineous effusion, or overflow of the blood, on being put in a low and weak state, to rich or succulent keep. They very commonly drop on a sudden, and die in the blood, as it is termed, when the carcasses putrefy almost immediately, and are totally lost. Pigs which die in this way, have their skins so universally suffused with the blood, that they appear enveloped, or rather shrouded in Morocco leather. In oxen, chiefly young cattle, nature commonly finds a vent for the disease in an eruption on the leg, quarter, or shoulder, attended with *pneumato-sis*, or a collection of air in the cellular membrane, or as it is commonly termed, between the flesh and the skin, whence the crepitating, or crackling noise which is heard on pressure. Another termination of the disease is by a deposition of matter upon the joints, whence the term of joint-garget or murrain. I know not whether I am correct, in referring the *Crateuch* to this class, which is said, in Scotland, to be a swelling and lameness in the legs, but the old writers particularly mention *blood in the legs*. *Blane* or GARGET *in the tongue*, attended with inflammation

and vesicles, or bladders in that part, is said to be a symptom of the disease, and also to arise from heat and fatigue.

This disease has swept off great numbers of yearling and two year old cattle, and become indeed endemial, in certain districts, where any such scourge was unknown, it is said, previously to the introduction of artificial grasses, with the full-feeding on which, the animals become surfeited: thus the improvident use of good produces evil. The breeders being alarmed at the ravages occasioned by this murrain, which generally carried off the forwardest and best of the cattle, no wonder that the fertile brains of cow-doctors were put into intestine motion, and that the ideas of their favourite engines, the knife or fire, were whirled uppermost. In effect, some skilful leech introduced the following most extraordinary operation, as a preventive of the disease in question, which, I apprehend, in the contemplation, either of physiology, or commonsensology, could have no better prophylactic or preventive view, than shaving the animal would have, which I beg leave to recommend in the stead, as at least free from cruelty. The ill-starred beast is cast, bound to a stake, all his four legs are cut open from the claws upwards, to the height of several inches, in order to find among the tendons and ligaments, a strong blood-vessel of a bluish colour, which said offending vessel, guilty of the original sin of producing joint-murrain, being caught with a crooked needle, is cut away. It is great pity, for the sake of hypothetical uniformity, that the above said blue blood-vessel had not been called a worm, since the brains of so many of our cattle-folk have been infested with worms, from very high antiquity. If I recollect right, it was Pliny who first enjoined the sage practice of worming dogs to prevent their

going mad. Fitzherbert and others describe to you a black worm in the sheep's claw, which must be extracted, with a heavy penalty in case of breaking it, in order to cure the foot-rot. Lisle saw the tail-worm of a cow, the presumed cause of leanness and *mislike*, which, in his opinion, was rather a maggot in the head of the operator. Even the famous Guinea-worm in the legs of the inhabitants of hot climes, which it has hitherto been the custom to twist so painfully and carefully around a stick, and which being unfortunately broken, occasioned a necessity to recommence the operation, turns out to be of the same family of those of which I am speaking, that is, of ideal or brain-worms. A physician lately in Egypt has found the swelling to be an *anthrax*, or burning boil, and that in all probability, the whole process of worm-twisting, or drawing away filaments of the membrane, actually enraged the tumour and retarded the cure.

But this blood-striking has given still farther scope to the productive ingenuity of cattle-doctors and heaven-born doctresses. Some years since, in a cattle-district, one hundred and twenty or thirty odd miles N.N.W. of the metropolis, arose an original genius, who cured the disease, and what was to him of far greater consequence, his own poverty, by simply *stroking* the backs of the cattle with his hand. For the originality of this man's genius, I think I may safely vouch, and that he never had even heard the names, far less had been initiated in the principles or practice of Mesmer, De Mainaduc or Perkins; probably he reasoned of his own head, euphonically, that *striking* must necessarily be cured by *stroking*, a very ancient and respectable principle of reasoning. My informant is a shoeing smith from the neighbourhood alluded to, who farther gave me intelligence of an unlucky rub, to which the doctor had lately been ex-

posed, in the career of his practice. A considerable number of cattle which he had stroked, nevertheless died. Unfortunately they belonged to a brisk young widow, whose temper was not quite so meek as that of her lambs and kine. The lady not only refused to pay, but exclaimed in a violent passion, "if that was stroking, she would never be stroked out of her money by the best doctor-fellow in the county." Beyond even this, it is positively asserted, that the famous dreaming doctress, Betty Hughes, of Fendon, near Kingsland, in Herefordshire, has acquired upwards of three thousand pounds by stroking, not indeed of cattle, but of that description of rational beings, who, in all times, have preferred miraculous operations to the tedious, slow, and mechanical processes sanctioned by reason and common sense. We must congratulate ourselves, that there are no real objects of charity in all the surrounding country, or so many persons in equipage, would never have crowded from afar, to bestow their superfluous money upon a wretched, dreaming impostor, who cannot write her own name.

Prevention of this malady is the only cure worth notice, because after the attack, the very nature of the case renders all remedy either uncertain, or of very little profit, even if successful, on account of the expense of time and money. With this view, the young cattle must not be pushed so forward in condition, and indeed the same precaution may be useful, in some degree, with respect to the full-aged. A piece of short or inferior keep should be reserved, as a *digesting place*, in which the cattle may be occasionally turned to empty and exercise themselves. Those observed to advance very fast, may be bled monthly for several months, of the efficacy of which practice however I have by no means so good an opinion as of that of giving medicines, which prevent internal obstruc-

tion. I am well aware of the difficulty, or rather total impracticability of such measures with a number of cattle in the field, or I am convinced, that occasional purges, or alterative medicines, would prevent those diseases, which seem to take their rise in over-repletion and accumulation. Six drachms daily, of equal parts sulphur and antimony in fine powder, would be sufficient for a young beast; but to be of any permanent use, it must be continued at least a month. Or salt might be of use. Rowelling also might be an efficacious preventive. Keep two rowels or setons open in each beast during several months. The disease having fallen on the joints, the best cure I should apprehend is to kill the beast, but if that will not agree, I am aware of no better method than to take him home, foment his joints, and give two or three brisk mercurial purges. The eruption of the black quarter, with *pneumatosi*s or *emphysema*, must be treated as already hinted in murrain. Emphysema or windy abscess may arise from other causes; from a foul and depraved state of the humours; of that kind probably, was the case of quarter-ill lately described in the Farmer's Magazine, and treated by the farrier with cold water and constant exercise. It is remarkable that ancient practice recommends pouring cold water upon ulcers. For the blane or swelling of the tongue, the old writers direct to cast the beast, and cut the bladders, filled with wind and water, which will be found at the root of the tongue, and near the windpipe, washing with vinegar and salt; also to bleed under the tongue. Bleed and give salts. INFLAMED and SWOLLEN PALATE, same treatment; scarify.

THE BLACK WATER. It is by no means easy to class this disease by the descriptions we have of it. It is said to be occasioned by suppressed perspiration from feeding upon cold, wet land, and that a simple

removal to a more favourable situation will often effect a cure. The blood is extravasated, and comes away with the urine and milk, tinging them with a black hue. Probably this blackness is merely a symptom of incipient gangrene in the kidneys, or from clotted blood, lodged thereabouts, a considerable time. Bleed, but if a cow, omit bleeding, unless on great necessity. Give twice a day cordial powders or ball one ounce to two, with half an ounce iron-filings powdered, either in warm ale or in a mash. Or nitre, myrrh and turpentine, one ounce each, in warm gum-arabic water. Bark, opium, nitre, in strong beer, if the progress of mortification be feared. Clyster if necessary. Malt-mashes with hay. On recovery, purge with salts or aloes, if purging required.

RED WATER. The urine comes away with a purple or blood colour. Dry keep. Corn mashes and medicines of the same class as in black water. Two ounces oil of turpentine in a quart of warm beer daily, a common medicine; iron-filings or oak bark, with two or three scruples of opium may be joined. If any feverish symptoms, nitre or the purging salts must be recurred to. The red water in cows and oxen, here spoken of, appears to me essentially different, in cause and effects, from the hydropic red water in sheep. The complaint in the former, is usually induced by eating harsh and prickly substances, which, it should seem, lacerate the small blood-vessels, and cause an extravasation. Thus cows being turned into a pasture, over-run with blackthorn, bramble, furze, and the large and harsh grasses, will often, on their first feeding, have their urine tinged with blood. The common remedy in many places, is to take them up, and give each beast, a pound of Glauber's salts, and if necessary, another pound next day; and a fresh attack of this kind, they say generally submits to such

treatment, however strange a styptic such copious relaxent doses may be supposed. DROPSY. Dry keep and salt in the water.

SCOURING-ROT. The SCOURING Cow. Cold at calving, long and hard journies, poor keep, &c. may bring this disease upon a cow, which will submit to good and comfortable living; in some, however, it is the result of constitutional debility, joined with the exhaustion of constant milking, and then incurable. Malt-mashes with an ounce or two of oak-bark, opium as above, &c. The scouring in oxen, which is occasioned by lodging on wet ground, in autumn, and feeding upon faint unwholesome fog, has often induced a mortal rot. It may be very aptly compared to the dysenteric flux, which sweeps off so many men encamped late in the year. On the first appearance of the scouring, the cattle should be taken to the home-fold, and put upon dry food, which will generally supersede the necessity of medicine. The following restringent mixture will sometimes stay a dangerous flux. One pint distilled vinegar, infuse as much fine scraped chalk, as, being stirred, will leave in the vinegar, the bare flavour of acidity, two or three scruples of opium, a gill of brandy, a spoonful of fine grated ginger, a pint and half of good beer, sweeten moderately with sugar; give the drink warm, if necessary twice the first day; afterwards once for a day or two. Or glue in warm ale, with opium and ginger twice a day, of as thick a consistence as can be poured down. Or, ipecacuan powdered one ounce, alum two drams, powdered chalk one ounce, white vitriol one dram, in warm beer and ginger as before. In case internal soreness be suspected, give warm two ounces spermaceti, and one ounce aniseed with sugar just boiled. Or boil a pound of fresh mutton-suet in three quarts milk, until the suet be dissolved, and give

the drink warm. In the recommendation of the austere and astringent medicines above, it is supposed that the animal purges freely, and without obstruction. This is a criterion in the case: for if there be tenesmus, or the purging intermit, appearing to be occasionally obstructed, laxative and cleansing medicines may be indicated, in the first instance, and previously to the use of those of the opposite quality. Here rhubarb is excellent, indeed truly specific, but cannot be afforded, unless the farmer chance to possess some of his own growth. As a substitute for rhubarb, give six drams of fine aloes (by no means the coarse or Barbadoes in this case) with an ounce of fresh aniseeds, ball with flour. Or perhaps a scruple of opium might be advantageously joined with the aloes.

INFLAMMATION OF THE LIVER. I know of no diagnostic guides in this case which can be depended upon, save that the animals always appear cachectic, and never fatten, whence unsound livers may be inferred. It is often, as I have seen, a natural or hereditary defect, out of the reach of medicine. I have heard of cows dying in a state of atrophy, the livers bloated, unsound, and swelled to an enormous size, and full of hydatids.

WOOD EVIL. Cramp in the neck, legs, &c. hide-bound. Rheumatism from exposure in bleak pastures. Take home and treat as in colds.

MOOR ILL. An affection from change of water, foul water, &c. If the animals must of necessity be accustomed to the new water, there seems no remedy. Individuals appearing in danger may be taken up and drenched with salts and cleansing diuretics. The importance of wholesome water, wherever procurable, ought to be well considered, not only as material to the health, but the quick thriving of the stock.

RISE OF THE HEART OR LIGHTS. Frequently no-

thing more than inflation from over-fullness, or from the nature of the food, and probably a sensation similar to that we experience in eating a *chokepear*. Keep the beast fasting half a dozen hours, or gently moving about, or drench with salt-water warm, after all symptoms of pain have ceased. CLUE-BOUND. FARDEL-BOUND. Costiveness from being long on dry-keep, or from eating abroad, oak-buds, leaves, acorns, &c. There will sometimes be a scouring at intervals, with heat and straining, yet the intestines are loaded with hardened excrement. Back-rake, give clysters, and an aloetic purge.

LOSS OF THE CUD. The beast mourns, and has no appetite, or drops its food without attempting to swallow it. Probably from defective irritability in the fibres, or contracting muscles of the *rumen*, or cud-bag, the animal is unable to throw up or ruminate, of course the bag remains loaded and obstructed. The intention is to remove the obstruction and re-invigorate the animal fibres. Let the animal fast some hours, then give a warm bran or pollard mash, with good hay and warm water with salt. This treatment alone may succeed with patience, even should the maw be obstructed by acorns or crabs. An aloes tincture made with brandy and ginger or capsicum, might be of use in this case. After conquering the obstruction, bitter infusions made of chamomile, carduus, horehound, oak-bark, &c. in beer, may be required, as restoratives, although perhaps good, dry nourishing feed will have an equal good effect. It is averred in Topham's book, that no liquids are ever admitted into the first stomach, nature having provided a pipe to conduct them to the third; an assertion which I doubt, but have no right at this instant positively to contradict.

GRIPES WITH COSTIVENESS. Give four or six drams

of fine aloes with two or three gills of good brandy, in two quarts thin water-gruel. Clysters. A clyster of tobacco water. This is said to be the most powerful of all deobstruents, and would be very useful in the colics of horses. I know not that it has ever been given at the mouth. **GRIPES WITH SCOURING**, salad-oil half a pint, a scruple to half a dram of opium, a wine-glass of brandy, ground ginger, aniseed, or any of the warm seeds, mix in a quart of good sound ale and give warm. Repeat according to occasion. The animal in these cases to be kept dry and warm. **HOVEN**, a common accident from a beast over-filling itself with green corn, or succulent herbage. The best mode of prevention is to cut and carry to the stock for several days, by which an opportunity is gained of regulating their appetites; or to set a watch over them on first turning into feed where the accident may be suspected. The last resort is paunching, a well-known operation, but dangerous with a cow in calf. Drenches of warm salt and water with brandy, and driving the animals about gently, will often succeed.

STAGGERS, DAISEY, OR TURNING. If the complaint originate in the stomach, over-fullness of blood, or catarrh, the obvious remedies are bleeding and cooling purges; but should it be a weak case, occasioned by hydatids, or any malady of the brain, it is needless, or would be deceptive, to offer any advice.

MILK FEVER. Young cows in high condition, will sometimes have feverish symptoms, and their udders will be distended and inflamed, several days before calving. It is proper to milk them several times, and rub the udder with brandy and cooling ointment alternately. If they catch cold in calving (an accident by all means to be guarded against with such stock) a milk-fever probably supervenes. Take the patient to the house, and treat her as in a bad cold, using either

the cordial and warming, or the cooling, febrifuge medicines, according to the symptoms. Place her with her head highest, in order to favour the natural evacuations, most probably suppressed, and watch her day and night. Unless observed in time, and before she drops down in the field, it may be difficult to get her home, and she may be lost.

WETHERING, OR RETENTION OF THE AFTER-BURDEN. I hinted in the fourth edition of the Calendar, that I thought it would be advisable if practicable, in bad cases, to extract the placenta by manual operation; but I have, as yet, no knowledge of any such experiment. Here is a perfect analogy, as far as I am able to judge, in veterinary and human obstetrics. I have known many cows retaining their cleaning, never after worth their keep. As to medicines to effect the desired end, I know no better than comfortable drenches with warm lodging, daily exercise, in fine weather, and nourishing keep; even clothing and rubbing. Drinks of warm ale with brandy and aniseed, and occasionally with two or three spoonfuls of volatile aromatic spirit.

POISONS. In the bites of venomous animals, the old practice of using volatile alkali, or good spirit of hartshorn, both internally and externally, has been revived of late, with great success. In swelling from eating poisonous herbs, or mushrooms, drench with vinegar and oil warm. Afterwards purges and clysters. Probably the tobacco infusion might be efficacious. In the bite of a mad dog, no practice yet known can be depended on, but excision of the bitten parts, or destroying them by fire, the wound being kept open and discharging a considerable time.

FOUL IN THE FOOT. Examine constantly the feet of cows, and more especially after travel or where they go much in the dirt. In case of any fissure or

cracks attended with heat, wash clean with strong lather, and apply oil of turpentine or tar and brandy, and keep the feet dry until healed. When the claws appear distended and inflamed, and the cracks have an offensive discharge, scrape with a knife and cleanse the parts, dress with Egyptian honey and oil of turpentine hot, butter of antimony, or any of the corrosive waters in common use. Should the foul be neglected until it become indurated or horny, extirpation with the knife will be necessary. But nothing is so necessary towards the cure, as keeping the parts perfectly clean and dry, for want of the resolution and care to do which effectually, many patients are never thoroughly cured.

CALVES. A complaint called the *CORDS* (see Farmer's Magazine) has recently destroyed a number of young calves in Scotland, both such as have been calved abroad and under shelter. Those which are brought up by hand, most liable, and the most dangerous period the first week or two. The disease is described as plethoric and inflammatory; the animals die red, with a general appearance of contraction of the sinews, whence the name, cords. It is not improbable, but this malady may hold analogy with the spasmodic affections, or convulsions of infants, arising generally from an acrid load in the intestines. As a prevention in calves, the meconium or first excrement (in any suspected subject) may be purged off with water-gruel and a little syrup of buckthorn, or rhubarb. On access of the disease give pulvis antimonialis (substitute for James's powder) as much as will lie on a shilling, in gruel, two or three times a day; or a tea-spoonful or two of magnesia, with as much calomel as will lie on a sixpence. The patient being in danger, tie his legs, and immerse him, excepting the head, in a tub of warm water, keeping him there as long as a com-

fortable warmth remain in the bath: rub completely dry in every part, and put him in a deep bed of straw. Repeat as needful. After all, perhaps this disease is purely the result of obstructed intestines, from over-feeding or want of exercise, and might be obviated by a timely dose or two of rhubarb and magnesia.

I have ever found a very satisfactory agreement between the medical practice of the nursery and that of the calf-pen, and have treated my few infant patients and my calves with the same medicines, opium excepted, which is a very ticklish medicine with infants. It is nearly impossible to prevent occasional over-repletion, and its consequence, acid crudities, either in the one species or the other. In every such case, give in gruel, rhubarb and magnesia equal parts, four tea-spoons-full. Or two or three ounces of Glauber's salts, or perhaps half that quantity of common salt, with a glass of peppermint or any spirits, in gruel. When the calf purges and is costive alternately, with straining, give the first. The purging in this case often leads to an erroneous exhibition of astringents, but there may be an atony, or defect of irritability, in the intestines, which disables them from ejecting their contents without the aid of laxatives. In scouring without obstruction, give an ounce or two of powdered chalk, Armenian bole one ounce, an ounce of aniseed powder, and a scruple of opium, in warm ale. Or two or three ounces of chalk, with half an ounce of grated ginger, in beer, may succeed. They will be frequently affected in a similar way, when first turned out to grass, and although it be totally contrary to custom, I well know that they are highly benefitted even at that time, by similar treatment. In some, the first grass will produce indigestion, crudities and WORMS. Symptoms—lying on the belly, trembling, restlessness, stamping with the feet: the constant

continuance of these symptoms indicate worms. There is no effectual remedy but taking them up, and giving mercurial physic; they who choose to run the risk, may do this abroad. The late Mr. Alderman Nelson informed me he always purged his hunters in the field.

PRESCRIPTIONS. First of PURGING. The neglect of medicines of this class, in cases of obstruction, I have observed to be a common foundation of disease. Bleeding is the favourite resource, as if that could possibly clear the intestinal canal, and unload the inside of those impurities in which diseases are engendered. In a publication already often quoted with respect, the exploded sophistry of the seventeenth century, relative to this subject is introduced, as from the mouth of a medical man, who insists on the danger to which a horse must necessarily be exposed, by purging, from the very considerable volume of his intestines, and the great length of the colon. A more powerful argument could never have been devised, in favour of purgation. As to the danger, thirty years experience with horses of most descriptions, have convinced me, it subsists in the omission, not the practice of purging. When I formerly so strongly recommended the fine aloes, it was from the ill effects I had often witnessed of the coarse, or as they are called, Barbadoes aloes, in horses of tender constitutions and delicate stomachs. Within a few years, I have made the experiment upon my own stomach, and find the effects exactly correspondent: these were cholera, trembling, cold sweats, violent straining, &c. Now nothing can operate, in general, with more mildness, or efficacy, than the fine aloes, and their after-effect is promotion of the appetite. But the jet of the business, in veterinary medicine is, the coarse aloe is both stronger and cheaper, and indeed succeeds well enough in common, only that

now and then, a horse, in consequence of a good dose of it, dies of the doctor.

I find the following strange passage in Dr. Layard, p. 53. "One observation is unavoidable, that medicines for that intent (purging) given in a solid form, will first be only received into the *rumen* or paunch, and must follow the same slow progress through most of the stomachs, as their food does. Secondly, liquid purges may be partially distributed in all the stomachs, and rather irritate than have the desired effect." Since neither solids nor liquids will answer the desired intent, in the name of all that is veterinary, whither are we to have recourse, now that pneumatic medicine is out at elbows? I have often demanded, why balls are not in use, with horned cattle, in preference to slovenly drenches, but have received no satisfaction. Is it because solids are more liable to be thrown up in the process of rumination? There is a favourable circumstance in giving medicine to neat cattle and sheep, they are fond of both saline and acid articles, and will take them voluntarily, in particular, from habit, those medicines which are continued a length of time. I labour under another difficulty in the case; Dr. Layard talks of purging a beast, and causing him to void hardened dung, with two ounces of lenitive electuary and half an ounce of Glauber's salts in bran-water. Some of the cow-doctoring books order three or four ounces of salts, as a purge for a cow, but I never saw a cow purged by so small a dose, on the contrary, many a large one at dry-keep, would swallow a pound or two with little effect. This branch of the subject, quantity of dose, is very uncertain, both on account of the real difference of strength in individuals, from difference of constitution, condition and keep, and from the irregular practice of

the description of persons who usually prescribe for cattle. I have generally ordered the lowest quantities, particularly of any, powerful drugs, which may be increased on experience of the necessity. Both jalap and rhuburb (the latter, on account of its price, must be totally out of question) are currently prescribed in those books; but will those articles really purge cattle, at least in the quantities ordered? If drinks must be used, jalap is far more tolerable as to taste, than aloes, the extreme bitterness of which, I think, should be covered by the large quantity of the vehicle, which again is inconvenient. Aloes will purge any of the domestic animals, whether in a solid or liquid form. Both sulphur and calomel agree perfectly well with dogs and cats, the latter generally vomiting as well as purging them; rhubarb will purge cats.

DOSE OF PURGING SALTS. From eight to twenty ounces Glauber's salts given in pails of warm water, four ounces in a pail. If in a drench, dissolve six ounces and give it in a very large quantity of warm beer or gruel, repeating in a few hours, and the following day if needed. **Dose of ALOES.** Four drams of coarse, or six to eight drams of fine, or succotrine aloes, to be given in either of the above vehicles. Let the beast immediately drink warm water, and afterwards at will. The addition of two or three scruples of calomel forms the mercurial purge. For a **YEARLING**, half an ounce of aloes, and two scruples of calomel. If a ball be preferred to a drench, the aloes may be given in white soap, or the ball delivered in oiled paper. **ALTERATIVES.** These act by degrees, in the case of foul humours, and must be continued a considerable time. Of all medicines of this class, sulphur is the most mild, and according to my observation, has the peculiar property of forwarding, rather than retarding thrift, whence perhaps its harmlessness, at least, in

the cordial ball. Sulphur, cremor-tartar, and powdered aniseed, equal quantities make an excellent mild alterative, of which several ounces per day may be given: antimony may be added to render the medicine more efficacious. ENEMA or clyster (purging) three quarts gruel or warm water, oil six ounces, half a pound to a pound salt. Several drams of common aloes, or ounces of jalap may be added. An astringent clyster to stop flux may be made of starch with a dram or two of opium. Cordial anodyne clyster to appease pain, boil two or three ounces of juniper-berries in beer, and add opium. CORDIALS. Powdered aniseed six ounces, ginger three ounces, terebinthinated balsam of sulphur one ounce and half, opium one ounce carefully mixed, treacle added if required. One ounce to two of this may be given in warm beer, or in balls made with flour. VETERINARY LAUDANUM. Infuse four ounces purified opium in one quart fine old strong beer, with two ounces good fresh aniseed in powder and one ounce ginger. Keep covered and strain off in a week. One to several spoonfuls a dose.

VETERINARY BALSAM. Equal parts of fine turpentine and Barbadoes tar liquefied or thinned to the usual consistence of a balsam, with the laudanum above given. Excellent in cough, internal soreness, affections of the kidneys, &c. STOMACHIC POWDER, to strengthen the appetite, equal parts of gentian, bay-berries and aniseeds, one-third ginger, all in fine powder, mix: does one to three ounces once a day for at least a week or ten days. Drink to expel the CLEANING in a cow. Two table-spoonful of the above balsam, an ounce and half of the stomachic powder, and half an ounce of powdered capsicum in warm beer, daily for several days: or four table-spoonfuls, tincture of black hellebore, and three of tincture of myrrh, with half an ounce of capsicum in beer. Drink

in MILK FEVER. Infusion of willow-bark, or febrifuge herbs, balm, chamomile, &c. acidulated with lemon-juice, and sweetened with sugar, &c.; nitre two ounces to two or three pints of the warm infusion every six or eight hours. Dry the willow bark in a bag, on the outside of an oven, powder and sift. Infuse one pound of the bark in a gallon of boiling water, twenty-four hours covered, strain for use. To DRY A Cow, bleed a quart, and give nitre and purging-salts in her water; after being milked dry, rub her udder with camphorated spirit or brandy, one-third oil of turpentine, several times a day. INTERNAL BRUISES from extracting the calf. Two or three table-spoonful of the above balsam, with two ounces spermaceti and one ounce Castile soap in warm beer. To promote desire for THE BULL. Omit milking both at night and morning, give at night good hay and malt-mash, with a drink of two or three pints of hot beer, in which have been mixed (as usual) a couple of eggs, a gill of brandy and some spice. Warm lodging. The cow will probably admit the bull in the morning. On the signs of approaching ABORTION, or slipping, the accident may be prevented by taking the cow in and giving any of the comfortable drinks, which also promote the secretion of milk. SORE TEATS. Wash with warm soap and water, and use the following ointment—Ceruse powder saturated with brandy, then mixed with goose-grease or elder-ointment. CHAFING the udder with the thigh. Wash clean as before, then bathe with brandy, and one-third strong Goulard water. Dry with ceruse powder shook from a bag.

FUMIGATIONS for an empty stable or room, in which infected animals have been kept. Put eight ounces of salt, and six ounces of powdered manganese mixed, into an earthen pan, and pour gradually on the mixture, four ounces muriatic acid. Instantly

quit the room, shutting up the doors and windows twelve hours. Sprinkling and washing with vinegar is, probably, by no means so efficacious in contagion, as was formerly supposed. A WARM BATH may be made with cloths soaked in warm water, and applied all over the body at once, and by pouring on warm water; but great care is required to prevent chills, to rub perfectly dry and clothe after. FOMENTATIONS are also applied with cloths soaked in the proper liquid. SPASM AND THE LOCKED JAW, to be treated with opiate frictions and blisters. If the animal be robust, the dashing cold water upon the parts affected, may succeed; if lax and delicate, warm-bath and fomentation. Same in rheumatism. UNGUENTS OR OINTMENTS for vermin and scab in neglected cattle. Cleanse the hide from scurf and impurities, with a flannel dipped in strong ley. Simmer on the fire train-oil and black soap equal parts, afterwards add, and mix thoroughly, equal parts of brimstone or sulphur-vivum, white hellebore and tobacco, in fine powder. Anoint all the affected parts: proper also for the scab in sheep. Give alteratives internally. The scab or mange in all animals is infectious, instant separation is therefore necessary. I have in a variety of cases, seen the fallacy of the fashionable notion, that these being merely cuticular affections require no internal remedies; such are sometimes indispensable to the cure. TOBACCO INFUSION. Infuse four ounces or upwards of shag tobacco in a gallon of boiling water, to be used as a clyster. Perhaps half a pint or more of this, with brandy and powdered capsicum-seed, in warm beer, might be instantly beneficial to cattle when *hoven*, or in colic. The capsicum expels wind powerfully, and as I have found, rather stimulates the intestines to motion than binds them, like most other warm seeds.

WATER FOR FOUL IN THE FOOT. Strong solution of

blue vitriol and alum in water. If required very powerful, the acid of vitriol one ounce, corrosive sublimate four drams; or an ointment made of the above mixed with honey and verdigrease, applied on pledgets of tow. **COMMON SALVE FOR WOUNDS.** Tar, oil of turpentine and ceruse powder, mixed with brandy. Keep the air from wounds. **A CHARGE OF STICKING PLAISTER.** Pitch four ounces, tar six ounces, wax two ounces, red-lead four ounces, oil of turpentine one ounce. The other ingredients being melted by a slow fire, stir in the lead, and keep stirring till cool enough to be spread. **COOLING AND STRENGTHENING EYE-WATER.** Distilled vinegar four ounces, Goulard's extract one teaspoon full, water one pint.

I have heard of a disease in oxen, called in Herefordshire, the **GUTTIE**, symptoms similar to those occasioned by colic pains. It is supposed to originate in violence done to the animal in gelding when a calf, by a rude and careless drawing out of the testicles. The parts, they say, sometimes gangrene, and the calf dies in a few days; or he may survive to be full aged, and yet be subject to a sudden attack of this malady, which, it seems, is cured by an operation. As to the rationality or use of the operation in the case upon a full-grown beast, I have no means of judging at present. That a calf may be lacerated or bruised in the operation of gelding, is probable enough, but they are in general more likely to fail from cold caught in the wounds.

RED WATER in the West Indies. I am informed by R. Gordon, Esq. of Belvue in Kent, who is accustomed to send the best-bred horses and cattle, as breeding-stock for the use of his estates in the West Indies, that the bulls on first being put on shore, are extremely liable to the red water, which often proves fatal. It is the opinion of Mr. Gordon that the

disease is occasioned by that eager desire for green, succulent food, in animals which have been so long confined to a dry diet on board, and which in course they will ever indulge to excess, the first opportunity given them: and that nitre and the purging salts, with bleeding, are the proper remedies. I have no doubt but Mr. Gordon's opinion is correct, and refer my West Indian readers to what I have already said on the subject, which appears to be equally applicable to their climate as to ours. In order to naturalize an animal to a foreign country, the first object is to avoid as much as possible, all sudden transitions to a difference of food, management or climate. Our cattle when first put on shore in a tropical clime, should be kept under cover from the burning heats by day, and the chilling dews by night. Moderate bleeding and cooling salts may be necessary as preparatives. The grass should be cut for them and dispensed in reasonable quantities, intermixed with feeds of dry provender. In cases of debility, treacle-possets with opium and cordial-ball, seem to be indicated.

SHEEP AND LAMBS.

THE ROT. This term is variously applied as follows. The rot or peculiar dropsy of sheep, the blood-rot or inflammation of the liver, the pulmonic-rot, or inflammation and consumption of the lungs, the catarrhal or glanderous-rot, the pelt-rot, the hunger-rot.

Upon the hydropic-rot, or as some of the continental writers style it, the great-rot, from the dreadful ra-

vages it has ever occasioned among the flocks, I have made a few introductory remarks in pages 287 and 304. Its cause appears to my observation to be invariably, *too great humidity of either earth, air, or food*. It is probable, that long exposure to stagnant moisture and its effluvia are certain causes of *rot* (the term being allowed) to all terrestrial animals; but the symptom of dropsy seems peculiar to the sheep, rabbit, hare, and deer. Of these, the sheep and rabbit are most liable to be suddenly affected.

The causes of this disease, formerly assigned, and yet retained in the opinions of many, I believe to be purely imaginary; namely, certain herbs, earthy particles, snails, quick growing grass or corn, and flukes (*fasciolæ hepaticæ*) in the liver and gall pipe. With respect to the fatal and rotting herbs, the names of which are quite without consequence, they have been all, or most of them, tried upon such sheep as would eat them, without the smallest deleterious effect; but the marrow of the matter is, they are aquatics, and generally grow upon a rotting soil. The snails which sheep may, and really do pick up on some soils, for such have been seen in their mouths, are probably full as proper to fatten, as to rot them; and as to the flukes, hydatids, worms and maggots, constantly found in their livers, their heads, or their entrails, it need no longer be doubted, that they are the effect, not the cause of diseases. The physical axiom *omnia ab ovo*, understood in too extensive a sense, has given rise to the most absurd and laughable sophistry. To support an hypothesis is generally the grand object, not whether it be founded in truth. Dr. Darwin, in the notes, I think, to his Botanic Garden, has recorded experiments of himself and others, fully sufficient to prove, that spontaneous or equivocal generation is, by no means, that absurd idea generally sup-

posed; and yet the Doctor could afterwards, gravely repeat that exquisite piece of Italian nonsense, of the breeze fly penetrating the anus of a horse, in order to deposit its eggs in his body. It behoves those who suppose that flukes, hydatids, or worms, have been received from without, in the state of eggs or seed, to demonstrate by what route such seeds could possibly arrive at, and enter into the substance of the liver and brain, or the blood-vessels of an animal body; and farther to exhibit specific patterns of those insects living upon the earth, without the body. It is mere assertion, that real flukes have been found adhering to plants and stones, nor do the worms bred in the animal body, bear any certain specific similitude to earth-worms, or any other insects.

It is affirmed, that land, over which water flows, and does not stagnate, will not rot sheep; that they are safe on salt-marshes, however wet, and even on Irish bogs, and watered meadows in spring, which yet always rot in autumn, from having been summer-flooded. That limed and even limestone-land will rot. That the hay made from unsound land will rot. The reader who is, from experience, aware how, and on what kind of foundations, these and similar opinions are formed, will receive them with much caution. It is believed, that seamen never get colds from being wetted with salt water, yet such accidents do sometimes happen, and we have heard, in great rotting years, of sheep rotting upon the salt marshes, although in general, they are a cure for the rot. As to watered meadows, much perhaps depends on the nature of the sub-soil, and whether it be apt to retain the water. I believe that sound land, through which the water percolates quickly, and which is nearly free from those moist exhalations, ever issuing from a retentive subsoil, will not rot any animals after irriga-

tion, even in autumn, unless they be put upon it too soon after watering. If bogs in Ireland are harmless in this respect, we know them to be fatal enough, both in England and Scotland: it may be, in Ireland, that sound spots for sheep-layers are found intermixed with bog, as we often find here upon wet commons. Limestone land is generally supposed proper to turn sheep upon, in order to cure them of the rot, and with reason no doubt, supposing that no extraordinary cause subsist of its retaining moisture. As to the hay of rotting land, occasioning the disease, it only amounts to this, some poor washy provender, from such soils, may occasion scouring in animals, and be inferior in nourishment to good straw; but there is land enough which will rot sheep lying upon it, and yet produce hay which shall prove an excellent dietetic medicine in the rot.

To say that exhalations from stagnant humidity in the soil, a long-continued humidity in the atmosphere, or a too great moisture and looseness in the food, are the efficient causes of dropsy and rot in the sheep, is perhaps the present sum-total of our ætiology on the subject, all we can say with certainty, and without systematizing on bases of sand. How and why the access of the disease should be so sudden, is the proper object of speculation and inquiry. But I believe the search after cures for confirmed rot in sheep, and glanders in horses, to be profitless, and the faith in preventive medicines, which will enable a man to expose his sheep to rotting humidity, without the common risk, not only groundless, but ridiculous. Thus far, the experience of ages has taught us to speak with certainty; we well know the causes and the means of preventing both the rot and the glanders: in all probability, the cure also of a recent case in either has been long well known. If we resolve voluntarily

and bravely to incur the risk of those diseases in their chronic state, it is easily to be divined, in what way we shall enjoy the fruits of our temerity. The Irish priest who lately engaged to render his soldiers invulnerable, by catching the musket-balls in his hand, if still in existence, I would recommend as a proper prophylactic doctor in the above case.

But I desire to circumscribe, within as narrow bounds as possible, my observations on this disease, since it is in far abler hands. Dr. Harrison, of Lincolnshire, has already written an excellent pamphlet on the subject, published by Bickerstaff in London, and promises, under the patronage of Sir Joseph Banks, to pursue it experimentally. With the objection of Dr. Pearson (*Annals of Agriculture*, No. 251) to *miasmata paludum* as the cause of rot, it is necessary to associate the well-known fact, that salt-marshes form the exception to a general rule in the case: leaving Dr. Harrison's hypothesis to stand upon its own merits, and at any rate, it can do no harm, his doctrines appear to be perfectly sound; but in my apprehension, those facts for which he himself can vouch, are, and will be, of far superior value to any which he may collect and take on trust.

On the topic of prevention of the rot, I refer the reader to the details already given of management. In long-continued rains, for example, such as in 1799, which prevailed throughout the whole summer, sheep will rot on all lands, even on a salt-marsh, and there seems no possible prevention, but in shelter and dry food. On the other hand, lands of the worst character for rotting sheep, deer and even cows, have been rendered perfectly safe, by a discharge of the stagnant water through the medium of effectual drainage. The signs of rottenness in sheep are but too well known to all shepherds. They begin with falling off in their

flesh, which feels flabby, and they become dull. Symptoms of low fever may be perceived by those who are accustomed to handle the ears and legs of sheep. The gums and tongue become pale and livid. The skin upon the brisket has lost its rosy hue. In the advanced stage, the eyes lose their lustre, and look like the eyes of dead fish, the blood-vessels which yet appear, look pale and sickly, the breath is foetid, the teeth loose, and even the horns sometimes, the sheep perhaps scours, and the wool hangs in rags, parting from the skin with a slight pull. Sheep sometimes, I believe not invariably, will take on fat with this disease, for a certain length of time, but it requires great skill to hit the crisis of their declension, after which, if they are suffered to remain, they will, in one week, lose the acquisition of months in flesh. Vast numbers are killed annually, although in good case, yet to a certain degree tainted with the disease, which appears by the state of the liver and the existence of flukes. Some die perfectly dropsical, and yet no flukes are to be discovered within them.

The cure of an incipient rot may doubtless be attained by securing the patients in a straw yard, where they can retire under shelter and go out into the air at will, and by feeding them with dry provender and allowing them salt in their water. Corn, bran, hay, pea, bean and other straw, are all excellent in the case, and it is a mode of wintering which suits sheep admirably. Broom and burnet are strongly recommended for the rot, and are supposed generally salutary in various diseases of sheep, considerable flockmasters should therefore have plantations of them, also of elder and melilot, asserted to be specifics. Should these plants and shrubs grow on high and dry grounds, such may be very proper for the reception of diseased sheep, or the grasses, boughs, or bark may be carried

to them, that they may voluntarily take their own medicine, for I have been so heartily wearied with the practice of ineffectually balling and drenching a number of sick animals together, that I can scarcely bear even the idea of it. On the authority of Ellis, ivy ought to come among the above specifics, and I think juniper bush, which the sheep will eat. As to balls and drinks, to those who are laudably ambitious of making experiments, who disregard personal trouble, and can persevere the necessary length of time, for rottenness and disorganization, however quick their access, are not repaired in haste, I offer the following, some on old authority, others on my own suggestion from the nature of the case. Dr. Lower's medicine. Give each sheep six or seven spoonfuls of strong brine, with soot steeped in it, to be continued eight or ten days. Ellis advises to mash a peck or upwards of malt, and brew it into twelve gallons of wort, then boil in it a quantity of shepherds purse, comfrey, sage, plantain, penny-royal, wormwood, and blood-wort; work with yeast, then add salt and tun the liquor. In April give seven or eight spoonfuls to each sheep once a week, in wet, but not so often, in dry weather. Both these nostrums have, I believe, been tried without any effect, often enough; nor can I see the least ground or reason for their use as prophylactics; although probably, in slight cases of rot, they might be beneficial. A spoonful or two of lime-water daily, with the free use of salt, have also been recommended. The following course would, at least, have the power to work some alteration in the patients. Take them into a barn, or stable littered, but well ventilated, and suffer them to go into a dry yard, several hours every day, the weather being fine. Give daily to each sheep a ball consisting of five grains of calomel, and one of opium, in turpentine, and continue the course

a fortnight, adding to the quantities if they appear defective, or omitting the balls some days, if they have too great effect. Afterwards, on appearance of amendment, give salt constantly, with good dry, substantial keep. On turning them out convalescent, a dry, healthy, upland range, or salt marsh. The solution of arsenic might be tried in this case, in a proper dose, or tincture of antimony, a tea-spoon or two, daily; or tincture of copper, half a tea-spoonful; or sufficiently diluted muriatic acid, several table-spoons; any of these last, with a spoonful of the laudanum before-mentioned. Rotten sheep will often be *cho-quered*, or have watery tumours under the chin; and the water, which is felt along the belly externally, may be discharged by an incision, the orifice to be stitched.

BLOOD-ROT, OR INFLAMMATION OF THE LIVER. See oxen. In this disease the liver is bloated and inflamed, of a dark hue, but covered with a white film or membrane, the substance brittle, and full of white specks, like seeds, knots or *schirri*. Seldom much water. The yellows or ague sometimes terminate in abscess in the liver. Lambs will die suddenly of the blood-rot, others will be affected by it to a certain degree, and yet feed tolerably to the end of their time. Granting it could be distinguished, I know of no probable remedy but salt or salt marshes.

CATARRHAL OR GLANDEROUS ROT. I have in diverse instances seen the clearest marked cases of glanders in sheep: the foetid, purulent discharge from the nostrils, either one or both, the membrane excoriated, the wool parting easily from the body, the symptomatic dulness and indifference, and the "mourning of the chine." The disease terminates in atrophy, the animals die carrion, and the pelts are good for nothing. The old writers mention the snivel and glanders.

Cause as in horses, inveterate, repeated and neglected colds, or sudden influenza. I know not that the disease is contagious in sheep, nor have I ever been able to obtain knowledge of a clearly ascertained case of glanders, caught by one horse of another, in the common course; nor can any notion be more groundless, than that the disease is most commonly so caught. Yet the extreme pungency of the putrid stench emitted seems to prove that its miasms must possess sufficient activity for infection; and veterinary experiments have long proved, that the disease is communicated by absorption. In sheep, the disease, taken in time, may be cured in a good warm dry straw-yard. Nostrials to be well cleansed, and washed with soap and water, which may be injected warm. Salt. If fever, sal-prunel. The comfortable things recommended for oxen in colds, in quantities properly reduced, namely, the dose to be generally one eighth to one quarter of the quantity given to oxen. Mashies. Kiln-dried peas, &c.

PELT-ROT. This malady is the consequence of the animal lying about wet commons, copses or woods in a starving condition, its wretched fleece always soaked with water, which, from low-spirited and sluggish poverty, it is unable to shake or dry. Sheep in the last stage of this misery, are fit for nothing, but to have their throats cut, and their carcasses thrown on the dunghill. When taken in time, drive them to a good straw-yard (the general and the best winter resort in all such cases) pull off the ragged wool, and give them an artificial coat, well rubbed in, of tar, turpentine and grease. Good straw-yard physic, viz. the best and heartiest keep. **HUNGER-ROT**, ditto, ditto, premising, if needful, pollard mashies, cordial ball, veterinary balsam, &c.

FOOT-ROT. Its general cause is the wetness and

poachiness of the soil, with the common exception of salt marshes, where sheep seldom have the foot-rot. Much travel backward and forward to fold, or by suckling ewes from the hot dung of a sheep-house, will occasion it. Some suppose it occasionally originates in the same cause which brings chilblains in the human feet. Dr. Wilkinson, of Enfield Chace, whose authority from practice stands very high, considers moisture as the predisposing cause, and has found the disease to be produced from the sheep continuing in long grass, during a mild winter. With respect to its being contagious, without denying the possibility, I must say, that I have never seen the probability of it. The same cause generally, although perhaps gradually, operates upon the whole flock, and then it is quite in order, for the lookers-on to suppose they catch it one of another. PREVENT on suspected grounds, by constant examination, and rubbing-in well, between the claws, oil of turpentine and common brandy, shook up in a bottle. The disease confirmed, cleanse the foot from dirt, and the discharge, and pare away the decayed and infected parts, using the milder caustics first. It may be necessary to apply pledgets, and bind up the foot, keeping the sheep in a dry place. See foul of the foot in cows. The pain of the foot-rot stops all thriving. Heavy sheep I believe are most liable to it.

Very opportunely, I have this instant, the honour of a communication from Lord Somerville, on the subject. His Lordship having read, in some late work, that the Merino-Ryeland breed of Sheep is incurably subject to this malady, states, that part of his pasture land in the West, was peculiarly apt to produce the disease, and that his father's long-woolled sheep always suffered heavily from it: that his own Merino and Ryeland sheep were in some degree affected, but

that the disease was entirely prevented or rooted out by a careful selection in autumn, by paring the hoofs of those which began to be affected, and by the use of "*styptics not too corrosive*." The disease has long since entirely ceased in Lord Somerville's flock of fine-woolled sheep, nor are any sheep in the kingdom, more sound in the feet than his Merinos and Ryelands.

In the simple FEVER of sheep, when it can be distinguished, salt, willow-bark-drinks with nitre, antimonial beer, &c. bleeding under the eye, in the neck-veins, or in the inside of the upper lip, or between the claws, or under the tail, or by slitting the ears.

BLOOD or BLOOD-STRIKING (See Oxen) Fever. The sheep will stand still, heave and pant, sometimes die suddenly. Bleed, and put into moderate and dry pasture, give salt and nitre in bran, if the animal will take it. RED WATER. This disease appears to me, to be a complication of the blood and the peculiar dropsy of sheep. It chiefly arises from filling themselves with too much succulent, or constantly wet and washy food. Long watery fog, turnips, rape and cole, will produce it, in any situation. The weak and watery turnips of poor lands are particularly apt to produce this disease, and also to accelerate the termination of the rot, by scouring: on the contrary, the substantial roots of rich sands, more particularly, if a little hay be allowed, far from injuring, are beneficial to sheep recovering of the rot. A shepherd who knows his business, will discover the red water, in its commencement. The sheep will frequently lag behind, or stand by himself, the belly somewhat distended; or walk forward singly, poking out his head, as if in quest of somewhat: the lymph or water will at length drivel from his mouth. Sometimes the animal is held up by the hinder legs, resting on his fore-

legs, when the water will distil plentifully from him ; not always a proper and safe practice. If the sheep be in good case, it may be more safe to kill him ; putridity, very rapid in this disease, soon takes place. As an attempt at cure, bleed instantly, unless the sheep be in poor condition. Drive gently to a place of safety, and give a ball of turpentine, nitre and honey or treacle. In a weak case, two or three pinches of iron filings in the ball. Should the animal be feverish, or its urine suppressed, as sometimes happens, no turpentine or any heating articles must be given ; in such case perhaps, nitre and the purging salts are the only safe medicines. Barley water with nitre, and a small quantity of vinegar, makes a good fever-drink. Scalded bran with salt. The allowance of hay or straw, with turnips or rape, is a good preventive of the red water, which is sometimes called the GARGET, or GANGRENE between flesh and skin, names which refer merely to the fatal termination of the disease.

GID. STAGGERS. TURNSICK. WORM UNDER THE HORN. PATERISH. STURDY. DUNT. GOGGLES. HYDROCEPHALUS or watery head. These are various terms for the dropsy of the brain : whether or not I am correct, in respect to including in this list, the goggles, or Wiltshire malady, I am uncertain, having neglected, whilst I resided in Hampshire, and had the opportunity, to pay attention to that disputed case. I shall not however neglect any future opportunity ; but I hope Mr. Creaser, a respectable veterinary surgeon of Bath, so much better qualified for the task than myself, if he has not already, will undertake it. The symptoms of water in the head are well known. In the phrase of my country, the sheep appears DUNTED, or stupid, and insensible, holding the head aside, sometimes turning round. The radical opera-

tion of trepanning the skull, and extracting the bladder, containing, according to Mascal, worms which are white like oatmeal grots, and which are alive, is performed in various parts, by which perhaps, one sheep out of five is saved; probably in skilful hands, it would seldom be attended with danger. Whoso would prefer the expense and trouble, may rowel or seton the animal, under the chin, and blister the head, giving mercurials. The old writers say, when the sheep holds his head on one side, there is a worm under the horn of the lower side, which they direct to extract by removing the horn. Hydatids or animated bladders are generated in the watery heads of sheep and cows; and maggots are often found in the brain even of apparently healthy sheep.

SHEEP-POX OR CLAVEAU. The *exanthemata*, or eruptions upon the skin, are particularly troublesome and afflictive to sheep, the pox dangerous and fatal, beyond all others; happily, although known in former days, in this country, the sheep-pox was never so fatal as abroad, and has long since ceased among our flocks; and the thanks of the country are justly due to the patriotic cautions of Sir Joseph Banks (*Annals of Agriculture*) on the possibility of importation with foreign sheep. Mascal thus describes the disease: "Sheep will have a scab which shepherds call the pox, and it will show on the skin like red pimples or purples, and they will be broad-like spots as broad as farthings, and there dieth many sheep thereof for lack of looking to betimes." The continental accounts of this disease, where it still prevails, and occasionally makes great havoc, are indeed dreadful. Hastfer, a Swedish veterinary writer, describes an eruption which attacks the face of the sheep in particular, and with such virulence, that the skin and flesh fall off, the eyes drop from their orbits, the ears and horns rot away, and

the skull is left naked. Sometimes it spreads over half the body before the animal dies. Hastfer supposes it an *erysipelas*, or St. Anthony's Fire, and says it is not contagious. According to the Swedish writer's account this is not a variolous disease in sheep; and it probably may be the same as described by Columella, and by our own early writers, who also perhaps spoke of the same disease, under the name of WILDFIRE, and sometimes MEASLES, as the only cure for which, they proposed the absurd and barbarous practice of burying an affected sheep alive, where the rest of the flock might walk over him! I have farther, little doubt but it is the same malady which Fuller records in his *Exanthemata* (a valuable old work) to have appeared in his time, about fourscore years since or upwards, and which re-appeared forty or fifty years ago in the South Downs of Sussex. Hastfer proposed nearly the following remedy on experience: Mercurial unction with tobacco and sulphur, rub the sores, and wash once a day with a very strong decoction of rue. I should suppose cooling and febrifugal drinks must also be indicated; on the other hand, cordials in case of suppression or delay of the eruptions, and the fear of gangrene, for which see Oxen. Separation of the infected, and housing the sick of course.

However differently the above disease is described, both in this country and in Sweden, I am somewhat confident it is specifically the *clavéau* of France and Germany, although in the latter countries it is said to be pustulous and deemed small-pox; at any rate, it is the *clavéau*, or pox, and not the common scab or mange, as has been injudiciously supposed, for the prevention of which the vaccine inoculation has been tried upon the continent, and hitherto with apparent

success. We might with equal reason inoculate to prevent the human itch, as the scab in sheep.

SCAB. RAY. RUBBERS. TAG. BELT, &c. The scab or ray, and the rubbers, in sheep, are of the psoric species, analogous with the mange in horses and dogs, and the human itch, and arising generally from the same causes, poverty and uncleanness, occasionally from suppressed perspiration in sheep, the effect of atmospheric changes, or the animal being heated by driving or chasing with dogs. When these diseases are merely superficial and cuticular, almost any of the washes or unguents in use, regularly and sufficiently applied, will eradicate them: but when they are constitutional, and the blood is affected, internal remedies, such as the alterants, sulphur, antimony, and common salt, must be given, which sheep will probably eat in bran. The cause being cold caught, the cure may commence with a few spoonfuls of some cordial purgative, as in colic. Poverty being the cause, dry lodging and good keep are specific, and a little cordial ball, in pollard or bruised oats and peas, will accelerate the cure, and forward immediate improvement. When the eruption seems to spread under the application of the remedy, and on being destroyed in one part, quickly re-appears in another, no doubt need be made, that the mass of humour is affected, and that internal remedies are indispensable. I have repeatedly seen this occurrence in human, as well as brute patients, and the most powerful ointments and washes afforded by the *materia medica*, constantly used for months, to no sort of curative effect. For washes, unguents, &c. see end of this section.

As to the RUBBERS, or violent itching, which allows the animals no rest, the only remedy is to take them

up, house them, and shear them close, cleanse their skins well with ley, applying afterwards very sharp lotions to the offending parts, or rather universally. The first effect of these will be very grateful to the animal, as allaying the itch, and it will turn the head round, and shew pleasing sensations by a motion of the lips and jaw; but the smart may be afterwards in proportion, and it may be necessary to tie the patients by the head. Plenty of salt, or other alteratives to be allowed, for, craving the patience of Dr. Stenhouse, no theory can be better established by fact or feeling, than that of *retropulsion*; this case, however, may not be one of the best illustrations.

In the old phrase, sheep are TAGGED OR BELTED, when their skin behind is heated and excoriated by the dung adhering to their tails and buttocks, more especially during a flux and scouring. A good shepherd (in repetition to the indolent) will ever keep the sheep and lambs perfectly clean in those parts, and close shorn if needful. In a bad case, the first necessary step is to take the patients to the hospital (a dry straw-yard) and the next to make all clear around the sores, to wash them well in strong sope-lather, or stale urine heated with the poker, then to strew upon them finely scraped and powdered chalk, or ceruse; next apply *Ægyptiacum* ointment, or tar and brandy mixed: lastly, cure the scouring by good dry keep.

GALL OR SCOWER. Put to dry keep, see the same in oxen. CUD LOST AND THROWING UP THEIR MEAT. Same kind of remedies and treatment as in oxen. BLAST OR HOVE. WIND COLIC. On the former nothing remains to be said. Sheep are particularly liable to flatulent colic after shearing, in unfavourable weather, on apprehension of which, in a flock, it would be a convenient thing to have ready prepared,

a cheap TINCTURE of ALOES, which may be thus made. Take eight ounces fine succotrine aloes, *fresh* capsicum and carraway seeds three ounces, equal parts, three or four ounces fresh juniper berries; powder the seeds and the aloes separately, mixing with the latter, about one quarter the weight of pure dry white sand. Infuse the whole in one gallon fine sound strong beer, and cover close for a week or a fortnight, stirring once a day; strain off and bottle for use. Should no accident happen to the sheep, this tincture will be useful in the colics of horses, and even in the domestic way as a good Daffy's elixir. A teacup full is a moderate dose for a sheep, and may be repeated according to symptoms, rub the belly with oil of turpentine and brandy mixed. Several spoonful of salad-oil may be mixed with the dose of tincture, or in a dangerous case of obstruction, a few grains of calomel may be given in a small ball of oatmeal and butter, and immediately after, a cupful of the tincture. Or two ounces Glauber's salts boiled in strong beer, with a table spoonful of brandy or strong peppermint-water may be given, and repeated in an hour or two, with clysters of gruel and salt. As to the symptoms, the sheep will appear swelled, rolling and tumbling about. Put into a warm house, litter deep, and beware of sudden exposure to cold and wet after recovery.

BLINDNESS may possibly happen from extreme heat in the dog-days, when it is usually associated with STAGGERS, in which case bleeding, salt and shade, must be the proper remedies. The sight in sheep, as in horses, is, I believe, also injured by low keep, and half-starved sheep in wastes, the suckling ewes particularly, are often seen blundering about as if half blind. The remedy here is still more obvious. But the most common cause of blindness in sheep, is that atmospheric stroke usually termed blight, which produces a *sty*

upon the human eye. Such is perhaps the primary cause of the *Ægyptian ophthalmia*, the sufferers generally expressing that they feel a sudden *coup* or stroke, the clouds of dust and sand, so constant in that country, serving to aggravate and inflame the disease. Sheep on being first exposed to severer climates than that to which they have been accustomed, become blind, as the Cheviots on their being wintered in the north of Scotland. This complaint will perhaps cease spontaneously, after a while, but the safest way, is to drive the animals home, and squeeze into their eyes, with a sponge, or rag, several times a day, the eye-water already mentioned (oxen) mixed with an equal portion of brandy. The old shepherds had a comical notion, that sheep blind in the summer were LARK-SPURRED; that the sheep having trod upon a lark's nest, the old one, like a game chicken, had spurred the intruder in the eye, and struck it blind. Most probably the sheep, in searching for short sweet grass, had stuck some sharp bent in its eye. It is sometimes better to cover the eyes in these cases.

NAKED DISEASE, in the Norfolk sheep kept in the fens and in Cambridgeshire. Probably a species of pelt-rot terminating in atrophy or consumption; upland or dry keep might possibly be the remedy: subject also much to the red water, and the ewes to warping or slipping their lambs, from the weak and washy state of their bodies: the same remedy indicated.

CORED UDDER, and WETHERING IN THE EWE. The udder of the ewe is liable to be inflamed, and to have hard tumours, which form obstruction in the lacteals, or milk vessels. Take her to house, and rub with camphorated spirit, or brandy, frequently, the udder being previously shaved and cleaned. If any tendency to gathering, or suppuration, when ripe, lance

the tumours and squeeze out the matter, and use the common salves. A teat is often thus lost, or both. A teat being plugged up and stopped, must be cleared for the lamb. The wethered ewe, or which cannot clean, to be treated like the cow in the same case.

MILK-ILL. In the south of Scotland, in a mild season, and plenty of grass, many of their lambs sicken and die, soon after sucking, and no remedy has been found. Probably this is a disease of over-repletion, analogous to the *cords* in calves, to which refer. Lambs are doubtless subject, like other sucking animals, to acid crudities, indigestion, and alternate scouring and costiveness, for the varying symptoms of which, the wit of shepherds has devised various names, wherewith to perplex themselves and others. See Calves. Perhaps keeping them from their dams awhile, and regulating their appetites, until they have acquired strength, may be a mean of preventing the malady. **The LEAF.** An old term for obstruction in lambs, a week or two old, which, upon ley-grounds and commons, are apt to pick up leaves and rubbish. They reel, stagger, and foam at mouth, as if poisoned. Purge with rhubarb, or any of the articles already recommended. **The DARTARS.** Old term for scabby chins and mouths, in lambs, either chopped by hoar frost, or torn by feeding on furze and prickly substances. Cleanse and anoint with tar and brandy, &c. **AUTUMNAL SCAB** in lambs supposed by the old shepherds, and not improbably perhaps, to be inherited from scabby rams, or, in equal probability, it may arise from neglect and poor keep after weaning. When the **WATER-BLADDER** may be felt full, under the chins of lambs, an incision may be made, and the water discharged, heal with tar, &c. **LAMBS FED BY HAND** are liable to costiveness, and from obstruction

will sometimes drop suddenly, although they feed and look well. Give salts. Rake gently, and give clysters of salt, oil, and gruel.

In North Britain, their flocks are subject to various maladies, to which their proprietors assign strange names, and seem to wonder, as elsewhere, why the diseases are incurable, although they keep the animals in constant subjection to, and enveloped as it were, in the proper and natural causes of these diseases. Like those worthy people, who, in possession of all the goods of life, eat and drink and sleep, heaping load upon load, taking no exercise and little or no aid from artificial evacuation, and then wonder why they are sick! Indeed, I ever admire, when I see them well.

The diseases of sheep in the North, appear to me perfectly analogous with ours in the South. GRASS-ILL, LIVER-CROOK OR STRINGS, LEAPING-ILL, THORTER-ILL OR TREMBLING, PINNING, LEG OR BLACK-LEG, BLUE-SICKNESS OR SPRING-WEAKNESS, at LAMBING-TIME, CLING, PINING OR VANQUISH, BRAXEY, &c. are merely local names for general diseases, or their symptoms. The GRASS-ILL, producing black dejections, in lambs, either when they first eat grass, or immediately after weaning. I have observed the same in calves; perhaps salt might be a remedy, although the more certain one would be keeping the lambs as much as possible from grass. It is indubitably the consequence of a vitiated digestion. LIVER-CROOK may be probably CORDS, or convulsions; the cause assigned, namely, from breeding in and in, most fanciful. LEAPING, and THORTER-ILL, or TREMBLING: an aguish and paralytic complaint, from exposure probably, or from the exhalations of fenny soils; it is sometimes attributed to the eating poisonous and narcotic plants. White vitriol, in bread-pills, is recommended, as the proper remedy.

This medicine has lately been revived for the cure of human intermittents, and it is said, fortunately; also in horse-cases, without success. I apprehend in the trembling of sheep, something volatile and cordial should be first of all exhibited (see colds) the vitriol afterwards might help as a tonic alterative.

I remember in former days, on the borders of Suffolk, several scores of lambs were seized with an uncommon malady, leaping and jumping about the fold-yard, in a strange manner, and a dung-heap being raised to the level of the eaves of a low-tiled barn, a number of the lambs ran skipping up to the top of the roof, as though they had been possessed by more devils than Mary Magdalen, or even the nuns of London. The whole parish wisely concluded they were bewitched, and a wretched and aged pauper became the object of their suspicions and their deadly hatred. I do not precisely recollect, but I fear the brutal, senseless and infernal supposed preventive of witchcraft, was resorted to, burning one of the poor animals alive! This tragedy was really acted at Ipswich in 1744, in order to the burning of Grace Pitt, whose family I well knew, and of whose death, supposed by Dr. Trotter to have been the consequence of spontaneous combustion, from the habit of gin-drinking, the Doctor has given an account in his late curious Essay on Drunkenness.

One is almost tempted, from similitude in many of the symptoms, to identify the GOGGLES of the West with the TREMBLING or PALSY of the North; at least, the diseases may be nearly allied. Formerly a trembling disease, affecting the hinder-quarters, like the goggles, made its appearance in Lincolnshire, and with similar consequences to those described in the North and West. That the SHAKING, in Wiltshire, thus described by Lisle, was the real goggles of the

present day, the latter term merely belonging to the new and improved nomenclature, I have no sort of doubt. Yet the goggles has been called a new disease, and people have pretended to wonder at it, and whence it came. "Some years the sheep will be apt to be taken with the disease they call the SHAKING; some farms are more subject to it than others: it is a weakness which seizes their hinder quarters, so that they cannot rise up when they are down: I know no cure for it. Some years an hundred of a flock have died of it." Strange and absurd accounts of the cause of this disease were given to Mr. Lisle. I should take the goggled sheep home, and begin with the warm bath, proceeding after according to symptoms.

PINNING, or scouring, until the tail be pinned or glued to the *anus*. PINING or VANQUISH, some malady caught by sheep haunting the tops of hills. CLING or Breakshaw, *diarrhæa*, or scouring occasioned by sudden transition from poor and dry, to rich and succulent keep: a very favourable crisis, in my opinion, preventive of the blood or red water. BRAXEY, or SICKNESS. This term is split into three, to wit, the dry braxey, the costive braxey, and the watery braxey, and the curious observation is made of the first, that it is more destructive upon some farms, and in some seasons, than others; in truth, so may be any other disease. The braxey appears to be cold and inflammation in the bowels, either from taking in with the food, rime, hoar frost, or from other proper cause; or the BLOOD, from a change of poor to rich keep, an error in many Scottish farmers, who wean their lambs upon short commons, turning them afterwards into deep feed. The STAGGERS of Lisle seems a kindred disease, which he supposed, as they now do of the braxey, in the North, arose from the

ground being tainted with the dung of the sheep. The costive braxey is merely the colic from obstructed intestines. The watery braxey, I suppose to be the red water, since it arises from the usual cause, attended with a symptom common enough here, SUPPRESSION OF URINE. I have already given a caution against the use of turpentine and other strong diuretics in this case, since it must be extremely improper to stimulate the kidneys to a still larger secretion of urine, when the bladder is already bursting full, and the sphincter so strained and paralyzed, as to be totally incapable of ejection. The shortest and safest course is to puncture the bladder, without wounding the guts, and so draw off the urine, covering and healing the wound.

PRESCRIPTIONS. For the SCAB or any eruption on the skin. Strong mercurial unction, one fourth of the weight of turpentine, mix well and make into an ointment, using if necessary oil of turpentine. Separate the wool and make a line from the head to the tail, drawing the finger dipped in the ointment along the skin. Same on the shoulders, thighs, and various parts of the body, wherever the humour appears particularly. In mild and dry weather there is no danger of cold from this ointment, but in bad weather the sheep should be housed. It is probably unsafe to trust infected sheep in the flock, on the strength of their having been anointed. Or the sublimate ointment—boil a quarter of a pound of tobacco in two quarts of water, dissolve in it half an ounce of corrosive sublimate, add two gills of spirit of turpentine and train-oil, bottle for use. From Veul. For the tobacco and sulphur ointment, probably equally efficacious with any, and unattended with danger, see p. 606. It should be remembered, that unless the unction come in contact

with the skin, it will be ineffectual, and it is ever far more certain, to wash the sheep first in a good ley, and scrape the scurf from its skin, and then to anoint.

SCAB WATER. Boil, or steep for several days, stirring often, one pound of tobacco, and one pound of sulphur in two gallons of brine, or stale urine, add oil of turpentine.

SHEEP-LICE, TICKS or FAGGS. Steep in a tub two pounds of arsenic, and four pounds of soft-soap, in thirty gallons of water, dip the lambs, taking care to keep their heads above water. Press the wool, and catch the liquor for future use, in a spare tub.

This quantity serves forty lambs. Used and approved by T. W. Coke, Esq. of Holkham and Lord Somerville.

The sheep thus dressed should be kept from rain a day or two. To drive away the **FLY.**

Ointment of coarse aloes, oil of turpentine and black soap, boiled together. Smear lightly the coats of the sheep.

MAGGOTS should be carefully scraped from the sore, to which may be applied turpentine and brandy mixed: or sublimate water and oil of turpentine, shook together in a bottle, and dropped into the wound. To make the water, dissolve half an ounce

of corrosive sublimate in two quarts of water. Some, without breaking the wool, pick out the maggots, and shake down white lead powdered, upon the wounds.

BALSAM FOR GREEN WOUNDS. Best turpentine four ounces, succotrine aloes and myrrh one ounce each, brandy one quart, cork up, and let the bottle stand in a moderate heat a week or two, then strain, and keep close corked for use.

SWINE.

DID my skill in the diseases of hogs, hold proportion with the losses I have suffered therefrom, I should, I will venture to say, be the most notable pig-doctor in Britain. Unfortunate however both ways, I know very little of the matter. Of all patients, these are the worst, and you may as well doctor or drench the devil as a pig. The old writers and their followers give a long list of the diseases of pigs, with prescriptions for the cure, and as far as I am able to discover, knew no more of the matter than myself. Swine are really subject to POX OR MEASLES, BLOOD-STRIKING, STAGGERS, QUINSEY, INDIGESTION, CATARRH, PERIPNEUMONEY, AND INFLAMMATION OF THE LUNGS, CALLED HEAVINGS. When sick pigs will eat, they will take medicines in their wash, when they will not eat, I have never found any help for them. As aperients, cleansers, and alteratives, sulphur, antimony, and madder are our grand specifics, and they are truly useful. As cordials and tonics, I know no better than treacle and strong beer, in warm wash, and good peas and pollard. In the measles, sulphur, &c. and if the patients require it, cordials now and then. In staggers, bleeding, fresh air, and perhaps nitre. In catarrh, &c. warm bed and warm cordial wash, same in quincy, or inflammation of the glands in the throat. If external suppuration appear likely, discharge the matter when ripe, and dress with tar and brandy, or the balsam above. The heavings or unsoundness of the lungs in pigs, like the unsoundness of the liver in lambs, I have sometimes found to be hereditary. I

know of no remedy. This disease in pigs is often the consequence of colds from wet lodging, or of hasty feeding in a poor state; in a certain stage it is highly inflammatory, and without remedy. Inunction with train oil, and the internal use of it, have been sometimes thought beneficial. For indigestion, see p. 454.

SUPPLEMENT to OX-LABOUR, p. 192. The premium was this year adjudged to John Billingsley, Esq. Ashwick Grove, Somerset, by the Bath Society, for the greatest quantity of work done by neat cattle only, from January 1st to December 1st, 1804. Mr. Billingsley pursued the untried measure of setting out his plough-work by the acre, and within eleven months, ploughed with the two-furrow plough and eight oxen, five hundred and thirty statute acres of land, the expense amounting to four shillings and ten pence per acre.

Lord Somerville declined the contest for the above prize, but presented the Society with a detailed account of his ox-labour for the last year, the substance of which is as follows. The actual quantity of land ploughed within the year, at Fitzhead, nine hundred and fifty-five acres and a half, but reducing the cartage upon the road, also performed by oxen, to the labour of acres ploughed, the whole would amount to full one thousand acres, which were worked by twelve oxen, from four to six years old, four to a two-furrow plough, with a man and a boy. Same to a waggon to draw lime, coals, &c. making on the whole one hundred and sixty-seven days work. The ploughing generally deep. Fifty-seven acres in autumn, ploughed, manured, and sowed, in three weeks, though the weather unfavourable, and the land close and heavy. The last nine acres were ploughed, dragged, sowed, and harrowed, in one day. Only three light-horses kept, and but one acre of the whole ploughed by

horses as a trial. The bulls laboured in turn. In nineteen years, Lord Somerville has not lost an ox, or broke a yoke or team by sickness, or accident, or injured the health or improvement of any by labour; and it is his Lordship's opinion, and that of the committee of the Society sent to examine the state of his husbandry, that working neat cattle, between the period of three and six years of age, do actually gain, after the rate of *twenty per cent.* yearly.

SUPPLEMENT TO FINE WOOL IMPROVEMENT, p. 391. On a most ample discussion of the subject, by an uncommonly numerous meeting of the members of the Bath Society, consisting of eminent agriculturists and manufacturers, the premium was adjudged to Lord Somerville, for his sheep and wool husbandry; the chairman, Benjamin Hobhouse, Esq. being requested to convey to his Lordship, in the handsomest terms possible, the unanimous thanks of a very numerous and most respectable meeting.

ADDITIONS

TO THE

SECOND EDITION.

ON THE NATIONAL SUPPLY AND IMPROVEMENT OF FINE
WOOL, &c. &c.

THIS work has been long out of print, a new impression having been delayed, for reasons which it would be superfluous to detail. I am unconscious of having omitted in the first edition, any relative topic of substantial interest, but the appearance of other publications and subsequent circumstances, have rendered it necessary for me to make some explanatory, and I trust useful additions.

The improvement of our fine woolled sheep still continues the favourite and prominent object in our rural system. The exigence of the present alarming crisis, and the well-grounded apprehensions of our manufacturers, have not been the smallest, I mean, they have proved the chief incentives to our industry. Yet it may seem strange, that in an opulent, highly cultivated, and enlightened country, any extraordinary excitement should be required, even at the most placid and regular period, to induce the acceptance of a duplication of both the quantity and quality of a commodity, so precious as fine wool. The possibility of growing upon our own soil, wool equal in fineness to that of Spain, and the success of the Spanish cross

upon our native sheep, which indeed never ought to have been questioned, are now fully and universally established by experimental flocks in various parts of England, Scotland, and Wales; and Ireland will not voluntarily be far in arrear of agricultural improvements. Opposition no longer arises from the commercial and manufacturing interests; on the contrary, we are now receiving the most useful and effectual co-operation from that quarter, particularly in the late able publications of Mr. Luccock and Mr. Bakewell.

To those publications I purpose to have recourse, touching certain technical points of knowledge in wool, within the peculiar province of the stapler and manufacturer; but on which, the improving grower also, will find it necessary to acquire an adequate degree of information. I shall previously say a few words, on a general plan for the more speedily disseminating the benefits of the Spanish cross, throughout all those districts which are especially adapted to the production of fine wool.

Sir Frederic Morton Eden, I write from memory, has in a late pamphlet, proposed that Government should, on certain conditions, provide the country with Spanish rams. Without presuming to question the merits of the honourable Baronet's proposal, or rather taking the advantage of repeating it, I may be permitted to state my apprehension, that the attention of Government is at this time, too fully engrossed to admit of any part of it being diverted to agricultural improvements. The natural influence of the Board of Agriculture, of the Provincial Societies, and of the great improving landholders, upon the growing spirit of emulation among the tenantry, is in my estimation, our proper resource in this and all similar cases. The Societies, should they so please, may have recourse to premiums, but the successful example of

leading individuals, and the introduction of good sized Merino rams into each fine woolled district, where the use of them, at a moderate rate, *may be had upon the spot*, will ever prove the most powerful inducements.

Much more credit than clearness of signification, used to attach to the notion of breeding for carcase and breeding for wool, as things separate and incompatible. Beyond all doubt, the carcase is of more general consequence than the wool; but experience has never discountenanced the opinion, that the progress of improvement, in both wool and carcase, may be equal, and that the individual or the variety, may excel in both. From what stock could we obtain more of the joint product per acre, than from our best long woolled sheep? or on the other hand, from our Merino South Downs and Ryelands? But the question is essentially implicated in that of *size*. It may be supposed, that although pure Merino sheep would render the greatest weight of fine wool, that they would fall short in weight of mutton; a matter, however, not to be decided without an experiment to determine the greater proportional number of Merinos which might be fattened upon an acre of food. Such experiments I have before proposed, and have heard that some are actually in train. It must be remembered too, that little improvement has hitherto been attempted upon the carcase of the pure Spanish sheep, either by selection with that view, or by generous keep.

Our present great national objects then, are an improvement in the quality of all our wools, and particularly in the quantity of our fine, to the degree of rendering this country independent of foreign supply. Length of staple and strength of filament should perhaps be more generally encouraged in our combing

wools, and the growth of middle wools discouraged, the animals bearing which, probably occupy the places of those, which would produce a regular and more valuable fleece, whether short or long; and one or other of the regular fleeces, would answer every purpose of middle wool, whereas that mixture is often *too short or too tender for the comb, and too long or too coarse for the card*. Nor does it appear that any loss of mutton, but the contrary, would accrue from this measure, were it general; and it would have the effect of ridding the market of a glut of ordinary, low priced goods, with which it has been always burdened.

To produce fine wool, in quantity and quality equal to our national demand, it is necessary, as has been so often stated, to encourage the breed of the pure Merinos, towards which, the late additional importation of His Majesty, will materially contribute: and thoroughly to impregnate all our best native short woolled varieties with Spanish blood. There is yet another measure of a general nature, without the regular adoption of which, I feel a decided conviction, that we can never arrive at the maximum of quantity and quality, either in wool or mutton; and after making some useful selections from Messieurs Luccock, and Bakewell, I shall use my humble, but earnest endeavours to convert the reader to such opinion.

In speaking of the *kemps*, or coarse hairy points of the fleece, Mr. Luccock makes the following observation, which merits the attention of every grower who desires to improve the quality and price of his wool.

Kemps, stichel hair, or cats hair, in colour white, grey, or brown, are commonly much coarser than the wool in which they are found, and often so intermingled with it, as not to be separated even by the motion of the scribbling machine. They will receive no artificial tints, but from the most corrosive ingre-

dients, and by their hardness, the sharpness of their points and their coarseness, spoil the article in which they are mingled. "It is obvious, however, that sheep which are kept in the richer pastures, and in good condition, do not yield a fleece with such hairy tops, as those whose lodging is upon dry fallows, and which are obliged to travel over a large space, with a heavy load, in order to obtain their food. Such fleeces are produced by neglected breeds, or animals grown old."

Caution is given against *jointed* wool and such as is irregular in the size of the hair or filament, the points being considerably coarser than the bases. Great consequence is attached to *trueness* or uniformity of size and fineness in the hair or pile; that it should have no inequalities, but should be equally elastic and strong throughout the whole length: "for wool destitute of uniformity in any of these particulars will place its coarser portion upon the surface of the cloth."

The wool-grower is counselled to place no dependence upon accidental and external circumstances, for the production of good fleeces, but to rely entirely and with confidence, upon the properties with which nature has endowed his sheep. The perpetuity of animal properties being scarcely any where more strikingly exhibited, than in the certainty and regularity, with which the parent sheep convey to their offspring, their own distinguishing characteristics. Breed is of the utmost consequence. It is the basis upon which all improvements of the flock must be founded; the only source of hope, that attempts to produce fine wool of the first quality, will be followed by success. Mr. Luccock's reasoning on this head is generally to the same effect, and very sound. It is a topic on which inaccurate and fallacious ideas are generally

entertained. For example, it is said, such and such land produces this or that kind of wool: but the fact is, the kind of wool depends entirely on the species of sheep which bears it, and the soil and its products, or other external circumstances, have no other effect than to vary the quality of the sample, the wool itself still remaining true to its species, long, short or mixed. Long and universal experience has established the fitness of heavy, coarse woolled sheep, for rich grazing grounds and marshes, confining the light and short woolled stock to the hills and higher pastures. Nevertheless, fitness and propriety, not absolute necessity, have given birth to such arrangement; since short and fine wool might be grown in the low grounds, and long wool in the upper, with an additional expence for winter keep; and although the accidental qualities of the articles might be affected, their specific, long or short, would remain the same. The large, long woolled sheep of the Cotteswold hills, are a proof in point. *

The shepherd ought not unnecessarily to expose his flocks to the extremes of heat or cold, nor to any capricious changes. - "The bad effects of water upon the pile while growing, may be owing to the readiness with which it mingles with the yolk, and carries off a quantity of that animal soap, which is so necessary to the good quality and even existence of the fleece; for if care be taken to prevent this, by the skilful application of tar mingled with butter, which act as repellents to the water, the lower part of the staple which grew after the mixture was applied, contains a sufficient supply of rich and nutritious yolk, and is a much superior sort of wool to those points of the pile, which have been exposed without protection, to the dripping wetness of the wintry season."

Mr. Luccock however speaks elsewhere, upon the

ill effects of salving, and particularly of tar upon the colour of the wool.

Calcareous or chalky earths, when mingled with the pile, render the wool dry and hard, destitute of that lustre and yolky appearance, which most other wool possesses, and of that *felting* quality, which fits it for the operations of the fulling mill; a process absolutely necessary in the fabrication of woollen cloth, but readily dispensed with in the production of some other articles. Chalk perhaps produces this effect by absorbing the yolk of the fleece. All mixtures of earth with the yolk, even that of pure silicious sand, are injurious, and it should be the farmer's object to preserve it pure and unsullied. Hence, when fine wool is the object, sheep ought not to lie upon bare chalks. Lime stone being generally covered with a stratum of earth, has not an effect upon wool equally injurious with chalk, yet the former is not supposed to render the finest quality. And there is a strong exception in favour of the well covered chalk hills of Sussex, upon which the finest wool of that county is produced. Nevertheless Sussex wool is said to be deficient in the felting quality, and in that respect inferior to most of our native short wools, the defect in probability owing to the chalky nature of the soil.

It is the object of the wool stapler, says Mr. Luccock, when he purchases fleeces, to obtain at a given price, as large a proportion as possible of the superior sorts. With him the fineness of the pile is the first consideration, and the manufacturers his customers can always work up wool of the first quality, if they could obtain it at a price which would allow them to meet the market. The thinness of the hair can very seldom if ever, be considered as a detriment to the fleece, but coarseness very frequently unfits it for a variety of purposes. The demand for cloths of the

most delicate texture, of course, for the finest wool, is incessant, whence the impolicy of depending on a precarious foreign supply, and the obvious policy, or rather necessity, of a sufficient home growth. Mr. Luccock observes there is no danger to be apprehended, lest the cultivation of fine wool should leave our coarser fabrics without supply, for the richer soils of this island and of Ireland, will continue to be stocked with long woolled sheep, *the fleeces of which are better adapted to those purposes, for which the middle wools of England are at present employed.*

In the present state of the woollen manufacture, length of staple is an object of great importance. *For the comb it cannot be too long, nor for the card too short.* The operation of the cards, which fine wool undergoes, is continued until the wool be completely torn between the teeth of the instrument, broken and blended, when by a particular mode of detaching it from the cards, it is rendered fit for the spinning wheel. Spinning breaks the wool completely, blends it intimately, forming it into a thin roll, or "roveling" of the slightest texture, held together only by the natural hookedness of the pile, or that disposition which it has to assume a zigzag, or waved form. Hence it is evident, that the two chief qualities of fine wool, are shortness of pile and a disposition in the hair to assume a crumpled or springlike shape. The staple being too long, labour becomes necessary to reduce it, more time is employed and a greater expence incurred; considerations for the wool grower, since he must refund that expence by a reduction of price. It is scarcely possible that the staple of fine clothing wool can be too short, granting it possess only that degree of *crumpledness*, or curling, which will enable it to form a roveling.

According to Mr. Luccock, this peculiar *shrivelling*

quality in wool cannot prevail in too high a degree, if it be destined to make goods of a close and smooth surface: *for the greater number of the minute curves which it contains in a given length of the pile, so much the more it may be broken without injury, and every portion retain a sufficient degree of curvature to link itself with its neighbours, forming an inconceivably thin and transparent texture.* The thinner this texture can be produced, and the greater degree of surface that can be given to it, so much the longer thread will it yield, and the cloth made from it, partake of a proportional degree of delicacy.

But for other purposes than that of fine cloth, this elastic or frizling property in wool, is not desirable and may be detrimental; and this circumstance among a variety of others, decides on the propriety and profit of *growing wools for a definite purpose, and not as in general, at random, to wit, neither long nor short, coarse nor fine.* Hitherto this object does not appear to have been within the contemplation of the generality of our flock masters, but in the view of improvement and profit, it is of prime consequence.

It seems moreover, that there is a spurious kind of curvature in clothing wool, which the shepherd is counselled to avoid in his stock, and Mr. Luccock affirms it to denote an inferior species from sheep, ‘the produce of very dissimilar progenitors.’ Another solid argument against these capricious and incongruous crossings of breeds, which we daily witness, and for which the breeders can assign no reason whatever. I must however remark that as far as I am able to understand them, neither Mr. Luccock nor Mr. Bakewell reason quite clearly on the subject of elasticity in wool; the latter particularly condemning that quality, which yet in some respects he considers necessary; the former most strongly insisting on its

use. With respect to the spurious curvature, I apprehend we have something to learn, and I submit to the enquiring sheep owner, Mr. Luccock's explanation as a text to reason and improve upon. He teaches, that

The cultivator of wool must not suppose, that every kind of curvature, which he observes in the fleeces of his sheep, is a symptom of aptness in the broken pile, to link together, and form a roveling, the first rudiment of the thread; for there is a sort of crumpledness in the staple, which the clothier avoids with almost as much care as he employs in seeking for the other kind. *It is distinguished by a singular adaptation of the curves in the pile to each other, as though they had been formed by some external pressure upon the staple, and not by a cause affecting every individual hair separately as it passed through the pores of the skin.* We can assign no reason why this kind of wool should be disapproved, unless it arise from the superior length of the curves, by which means the staple cannot be broken so much as it ought to be, and every portion still retain its power of uniting with those which are near to it; this peculiarity is known to be detrimental and ought to be avoided.

In some of the finer kinds of wool possessing the shrivelling property in a high degree, the chord subtending the arc, is sometimes not longer than the hundredth part of an inch; but in those of inferior quality, where the curvature is not of the most valuable kind, the chord or distance between one extreme point of the curve and the other, will measure the sixteenth, and sometimes even the eighth part of an inch. The great difference in the arcs is easily discernable by every untaught eye, and most especially deserves the notice of the grower. Thus far Mr. Luccock on this

minute topic; I certainly cannot pretend to understand wool with the precision of a wool stapler, and may not be quite correct in my conjecture, that the defect complained of, is probably the natural result of a coarse and hard filament and too long staple.

Perfect whiteness is eminently desirable in all kinds of wool, and all varieties of colour in breeding are to be avoided, and particularly all artificial tinges with ruddle or ochres, or any such substance, which is injurious to the pile for the dyer's purpose.

The importance of rendering wool as light as possible, is clear to every one who considers that the quantity of cloth, which a given weight will produce, is the true test of its value. Yet the grower, as though totally negligent of so plain a principle, has often been solicitous to increase the weight of his fleece, without considering whether he augmented the quantity or the density of the pile, a distinction with which every clothier must be acquainted, although he may express his ideas in different language, for he buys the material by weight, and sells it when manufactured by measure.

Complaints are made against the shepherds of certain districts, for wool washed with little care, encumbered with a great deal of yolk, pitch and filthy substances, together with the brand mark which destroys the staples of the part on which it is imprinted. Also of wool stored in improper places, until it has acquired weight by the absorption of moisture; or in the yolk, until that shall have gone into the putrid fermentation, by which the quality of the wool is essentially injured. Formerly, false winding was too prevalent amongst ignorant and unprincipled wool growers, the bundles containing, beside various impurities, quantities of daglocks, mort wool, or that from dead sheep, and such as had been prematurely shorn, before the staple had attained its full length.

Sheared sheep turned into a newly mown pasture, their coats attract the short ends of grass left by the scythe, and remain sticking in the bottom of the fleece, until in the end they are rolled up with it. These, with any dried vegetable particles, such as hay seeds or chaff falling from the rack into the coat of the sheep, occasion much extra trouble and expence in the manufacture of the wool, since if left, they would be wrought into the substance of the cloth, whence they must be extracted by holes made, to be afterwards repaired at the fulling mill or by the fine drawer.

One custom, well worthy the attention of shepherds in general, is said to prevail in a northern district, where, in most other respects, little care is used. Instead of the common pitch-brand upon the fleece, a permanent mark is fixed upon the ear of the sheep. Hay in racks should be upon a level with the heads of the sheep, and the staves by no means too wide apart, since some sheep, particularly it is said the Spanish, are the most wasteful animals in the world, of their provision.

In Germany, the common practice is to clip their sheep twice in the year, by which more wool is gained by one tenth, than by clipping only once. It is observed, the longer the wool, the less quickly it grows, and that in Germany, the autumnal fleece generally produces the best price. Mr. Luccock adds, that the staple of most of our British fine wools is complained of, for its too great length, by the manufacturer, a defect which would be most effectually remedied by twice shearing, which would also improve the quality. He however excepts all long, or combing wools, in which their utmost length is required, and some of our finest clothing wools, the pile of which is so tender, as to render the full growth of the staple

necessary. I do not expect to hear of the practice of twice shearing being adopted in this country, but in case any one should incline to make the experiment, I apprehend that on the second or autumnal shearing, it would be extremely dangerous, or rather certainly destructive, to turn the flock abroad, until the new fleece be well grown; in fact, after being clipped and properly greased, they ought to be housed, and thenceforth treated as straw yard stock. On the subject of *plucking* the fleeces from the bodies of that species of sheep, which shed their wool, perhaps Mr. Luccock, as well as the philanthropists he desires to ridicule, refines rather too much. The fact I fear is too well established, that much cruelty is occasionally used, where the practice of plucking prevails, whether of sheep or fowl.

It is remarked, that the pure Lincolnshire sheep has been rarely met with of late years, in that county, where the Dishley cross has been almost universal. There can exist no doubt, that the consequence has been, a much larger quantity of both mutton and wool per acre, with perhaps no great deterioration of the quality of the meat, although our epicures miss with regret, a portion of the high flavour of the genuine Lincoln mutton. Mr. Luccock states, that the New Leicester cross, indeed a natural consequence, has rendered the Lincoln wool finer and shorter, improving also the colour, but that it has at the same time, lost a large proportion of that *toughness*, which is an indispensable quality in good combing wool, and which he seems anxious to have restored. The obvious method then, is to re-cross, either with well selected rams from the vicinity of Boston, where it is said, the purest old Lincolns are yet to be found, or from the relics of old blood in the Midland counties. The late Mr. Chaplin was strongly tinctured with the old prejudice

in favour of great size and bone, and I believe, bred constantly to that end. Probably a more rational system would have enabled him to improve his favourite stock to the utmost, and to equal that of his rival Bakewell, in number, at any rate, in weight per acre, retaining the natural superiority of quality of the Lincolns. And this must have been by a practice the direct reverse of his own, namely, by selecting for breed, the smallest and finest boned of the Lincoln sheep, and so gradually reducing their size, yet preserving the genuineness of their blood. The quantity of wool produced by the Dishley sheep, equalling perhaps, by the acre, that of any other long woolled breed, affords a solid proof of the compatibility of the growth of wool with the production of fat.

The great importance of long, or combing wool is evinced in the fact, that the fleeces wrought into worsted goods employ a much larger capital, and a greater number of hands to manufacture them, which being exported, produce to the community a more considerable return, than the very same wool would have done, had it been wrought into woollens. The difference in favour of worsted goods, is even averred to be as nearly three to one. Genuine long woolled sheep are perhaps universally white in colour, and without horns. Sheep with horns and speckled faces or legs, bearing long wool, such indeed seldom produce a long and weighty staple, are a mixed breed, and rather to be classed with middle wool breeds.

Mr. Luccock directs the attention of the growers of long wool to the attainment of a LONG, SOUND, and TOUGH STAPLE: the means are well formed tups bearing such fleeces, and ample keeping the year through. Mr. Luccock observes of light soils, from such land assisted by oats and oil cake, as heavy a fleece has been obtained, as from sheep fed in the most luxuriant

pastures; a convincing proof that the constitution and nourishment of the flock, are of more consequence in the production of both mutton and wool, than the climate or the soil, or any other circumstance.

We learn from MR. BAKEWELL, that *softness of pile, rather than fineness of the thread*, has become of late years, the distinguishing characteristic of excellence in cloth; by consequence, softness and silkiness are the most valuable properties of fine wool. Cloth, he observes, is now finished without that hard shining surface, which was given to it a few years since, by hot-pressing, and which prevented the softness of the pile from being felt. By the present mode of cold-pressing, the softness of the pile becomes immediately perceptible to the touch, and is considered as one of the most distinguishing and essential qualities of a good cloth. Mr. Bakewell ascribes the hardness of wool chiefly to the sheep being fed on siliceous or calcareous soils: the various hues of the wool of different breeds to the soil also. On the red-brown colour of the Spanish fleece, once supposed to be derived from the soil, see page 48 of this work.

An unfavourable change takes place on shorn wool, kept long in a very warm and dry temperature; the fibres become indurated, rigid and elastic, and acquire the properties of the hard wools. The greater the degree of warmth, the more speedily will the effect be produced. Wool which has been shorn three or four years, will not spin or felt so well as when kept only one year. A dry situation is necessary for the preservation of wool, which however at length, loses its natural moisture and becomes hard like wool of limestone districts.

To the above observations of Mr. Bakewell, may be added the following old practical opinions. Wool

increases in weight by keeping, if put up hollow, but does not *grow* (attract moisture) until after sweating is over, at Michaelmas. Wool bound close, that the sand cannot intrude, pays interest of money, until spring, but should be sold before the March winds set in. Moving wool about, or from place to place, occasions loss of weight. Formerly, when indeed it was more frequent, the peculiar use of black wool, equalized its price with the white. In the manufacture of coarse druggets, black being mixed with white wool, the expence of dye was spared, and the cloth being exempt from the rotting quality of the dying material, was the stronger. After two years, wool grows *stark* (brittle) and harsh.

Our climate, in many respects, unfavourable to the growth of wools of the best quality. *The fleeces frequently drenched in rain; their natural yolk mixed with the soil and washed away; and the animal long exposed to the chilling effects of evaporation, or a sudden change of temperature; all these causes constantly operating, must tend to prevent the production of wool, which may equal that given from the same sheep, in a drier and less changeable clime.*

As one preservative, Mr. Bakewell strongly recommends the ancient practice of salving or greasing, with the late improvement of using no greater quantity of tar, than merely sufficient to give the mixture tenacity. This he warrants, and I conceive very safely, will be equally beneficial to the wool, promoting both its increase and good quality, as defensive to the body of the sheep. These greased wools have found a preference in the market, and Mr. Bakewell avers that they appear to improve and become finer, in every process of the manufacture; whereas on the contrary, the hard wools appear to grow coarser by

the same treatment. To the practice of greasing, he attributes the superior softness of the Northumberland wool over that of any other native breed.

Mr. Bakewell is so fully convinced of the utility of greasing, that he advises it immediately after shearing, an instance of which is given in pages 315 and 323 of this work. In his opinion, the trouble and expence of it, twice a year, will be well repaid by its beneficial effects upon both the carcase and the fleece of the sheep, in every part of Britain. He observes, by the first greasing, the wool will be covered and defended from the action of the soil, when the particles are most pulverized and active, and it will be kept soft and moist, during the parching heats of July and August; and that he has reason to believe, that the top of the staple of a greased fleece, would not become harsh and discoloured, which is frequently the case with English wool. I entertain no doubt that considerable benefit may be derived from greasing, provided we do not continue as heretofore to limit our winter defence to that practice. At the same time, it does not appear to me that we have far to seek for the harshness and apparent coarseness of a fine fleece immediately after shearing, the natural result of the mechanical operation of the shears. With respect to the effect of heat upon wool, and the case of the African sheep cited by Bakewell, it has never been denied, I believe, that excessive heat may have a temporary ill effect; nevertheless we have well attested accounts, both ancient and modern, of a breed of sheep at Algiers, bearing a fleece equal, if not superior in fineness to those of Spain, a fact indeed countenanced by Mr. Bakewell himself.

Additional and very powerful inducements to spring and summer shearing, are the following: the ointment destroys the sheep tick, and has a tendency to prevent

cutaneous distempers, and to preserve sheep from the stroke of the fly. Farther, a considerable quantity of wool will be saved, which is torn off by sheep when rubbing themselves, in order to allay the irritation of the skin occasioned by those causes. And Mr. Bakewell ingeniously and rationally conjectures, that the ointment, by keeping the skin in a soft state, is favourable to the production of finer wool, from the opening of pores or vessels for the extrusion of wool, which had closed and ceased to act, on the too great exposure of the skin to the air and soil; and that thus the pile grows closer, and a larger fleece is produced. The ointment resists the action of moisture more powerfully than could the natural yolk of the wool, were that supplied in greater plenty than it is ever found in our native breeds, and Mr. Bakewell gives an example of the superior warmth and dryness apparently enjoyed by greased sheep on the mountain sides, where greased and ungreased brouzed together. I must however remark, that to the late improvement in greasing, and the superior cleanness of the wool, in all probability, is owing the success of the practice; nor can there remain a doubt of its former injurious effects, as explained by intelligent staplers.

The following is given as the Northumberland preparation: from sixteen to twenty pounds of butter are placed over the fire and melted, a gallon of tar is then added, and the mixture is stirred until the two substances are well incorporated and form a soft, tenacious ointment. The care always necessary in the application of ointments to the sheep is especially so in this case: for, says Mr. Bakewell, *If the ointment be merely rubbed on the wool, it collects on the top of the staple, attracts and mixes with the soil, and is rather injurious than beneficial to the fleece.* The staples of the fleece are to be divided with one hand

and the ointment applied to the skin, with the finger of the other hand, by which means the ointment is softened by the warmth of the skin and equally diffused throughout the fleece. The quantity required will in course vary with the size of the sheep, but generally, and in the lighter mode of greasing, one gallon of tar and twenty pounds of butter, will be sufficient for forty or fifty sheep.

Mr. Bakewell acknowledges that a considerable quantity of tar communicates a dark tinge to the wool, rendering it unsuitable for the brightest dyes or for those goods which are finished white, and therefore desires a cheap substitute for tar. He proposes bees wax, hogs lard or olive oil, melted with the butter, and if any tar be used, that the quantity should not exceed one quart to ten pounds of the mixture; and that in warm situations, where sheep are well sheltered from rain, and where the soil is free from lime or chalk, a less tenacious ointment be used and tar entirely discontinued. Greasing is beneficial to wools of every description, and will, it is affirmed, improve the fleece to a degree sufficient to compensate for the weight of grease which may remain, after the sheep are washed. As a proof, the fine wools of Northumberland, greased and tarred to the full, sell at an equal price, and have a readier sale, than the ungreased wools, which do not waste so much in scouring, by 25 to 30lb. per pack of 240 lb.

Great importance is attached by Mr. Bakewell to this practice of greasing, which he thinks sooner or later will become universal among us. Perhaps wax will be thought too expensive for the purpose, in which case Lord Somerville's recommendation of yellow ochre may be tried, to be mixed with oil or butter. The truth is, with a resolution to adopt the practice, the best ingredients for an ointment will not remain

long undiscovered. By way of removing all objections to greased wool, Mr. Bakewell advises to wash the sheep in tubs of warm water with soda, as is practised in Sweden, the foul water being preserved as a manure. Indeed it is impossible the close Spanish fleeces can be washed clean, in the common method. I refer the reader to my former observations on this subject, page 418, but the wool staplers apprehend that unskilful labourers, however clean they might wash the shorn wool, would afterwards acquit themselves very ill in sorting or putting it together, and after all, drying the wool would be almost an impracticable business. English wool, washed in the usual manner by the grower, loses afterwards in scouring 25 lbs. out of 100 lbs. Unwashed loses 40 lb, supposing the wool free from daglocks and pitch marks and scoured perfectly clean. Spanish and Saxon wools come the purest and cleanest to market, in course have the least waste.

Mr. Bakewell thus describes the Saxon wool: Much of it equals in fineness, the very finest Spanish. True grown, viz. having a very small quantity of inferior quality, in any part of the fleece. Entirely free from a coarse, silvery hair running through the fleece, common to many piles of Spanish wool. Will spin finer when carded, than Spanish wool, and is suited for light kerseymeres and pelisse cloths. Fleece washed on the back of the sheep, cleaner than the English fleece, the average weight nearly two pounds. Inferior to Spanish wool in the following important respects, perhaps from the influence of climate. Less sound in the staple than Spanish wool, nor will it make a cloth of equal firmness and durability. The yolk not so copious as in the native Spanish fleece, nor the wool so close and thick upon the skin. Resembles Norfolk wool although much finer. The want of soundness of staple, a great defect in the Saxon wool, for the

general purposes of the cloth-manufacturer. *It may arise from occasional deficiency of food, from extreme cold, or from the fleeces being long and frequently exposed to rain.*

To preserve all the best qualities of wool in the Spanish breed of sheep, in the opinion of Mr. Bakewell, it will be necessary to attend to the three following objects. The first in importance, is the purity of the breed: the next, that the fleece be covered by nature with a copious yolk, or being deficient, that it be supplied by art, nor should the unctuous covering of the wool be absorbed by a mixture with the soil on fallows, or washed away by the rain. Lastly, that the sheep be kept dry, sheltered from the extremes of heat and cold, and their quantity of nourishment regulated.

The first of these objects Mr. Bakewell very properly leaves to our intelligent breeders. As to the benefit of shelter, he adduces the ancient practice of COTTING, or housing in Herefordshire, with a proof that the Ryeland wool has degenerated in quality from the neglect of that practice; to which also, I may add, a disregard of the genuineness of their breed, by an injudicious crossing for size, the common self-deception of ordinary breeders, whose eyes are filled with individual bulk, when their judgment ought to be directed to weight of mutton and wool per acre. To repeat his opinion, and it merits a dozen repetitions—*It is obvious that housing sheep at night, and providing them during the day, a shelter from the rain and sun, must preserve and improve the wool; and also essentially conduce to the health, comfort and preservation of the animal.* On the third object, I cannot altogether concur with Mr. Bakewell.

As to regulating the nourishment of sheep, in my apprehension, the most necessary and profitable re-

gulation, is not to starve them. Mr. Bakewell inclines to the old opinion, that to feed sheep high, increases the quantity of the fleece, but deteriorates the quality of the wool, by rendering it coarser, an effect which he has witnessed in forest sheep fattened; but he acknowledges that some breeds, more particularly the Spanish, resist this effect; of which Lord Somerville gives a proof in his own flock. Similar proofs may be drawn from the flock of Dr. Parry and various others, British and foreign. It is universally known, that full feeding of the sheep, will increase the length and weight of the fleece, it is probable, that it may also have the effect of increasing the circumference, size, or thickness, of the individual hairs or filaments. This granted, are fineness and coarseness in wool, indicated by the size of the filament only, or may it not happen, that the larger shall be the finest and most silky, and the smaller more coarse, hard and wiry? I am not prepared to prove such effect, but doubtless, the possibility is easily conceivable. The greater quantity of yolk produced in a well fed and luxuriant fleece, one would suppose probable to render the filaments more soft and pliable, in short, to have in a yet superior degree, those effects expected by Mr. Bakewell from artificial greasing. Examples of the coarseness of the larger fleeces, are brought from English stock only, perhaps because more easily discernable, from the comparative specific coarseness of English wool. It is not stated, whether this judgment has been formed from the sample of wool only, or conjointly with that of the cloth manufactured from such wool. At any rate, we are perfectly easy respecting our home grown Spanish wool, which, shorn from fattened wedders, produces superfine cloth of unimpeachable quality, however our lean sheep may, or may not, produce wool of a still superior fineness.

A cool, moderate temperature, according to Mr. Bakewell, is more favourable to the production of fine wool, than excessive heat; and were the sheep of Spain like those of England, unprotected against the effects of climate, he should have no hesitation in saying, that the situation of that country would be in some respects worse than that of our own island, and more unfriendly to the growth of a fine even staple. But to the other qualities, the soundness and softness of the fibres, our frequent rains are very prejudicial, unless the sheep be sheltered and defended from their effects.

He makes a very forcible appeal to the interest and humanity of the Northern farmers, by stating, that according to his information, the loss of many of them by the severity of the winter 1807-8, amounted to more than half their flocks! Surely enough to awaken them from their supineness!

Wool-growers are strongly recommended to preserve their fleeces pure from an intermixture with black, brown or grey hairs, which render the wool inapplicable to many purposes of manufacture, and considerably reduce its value. Our Norfolk, Sussex, and Wiltshire fleeces, are particularly liable to this defect. And Mr. Bakewell farther complains, that a race of black sheep, not to be tolerated in any, are suffered to exist even in our Merino flocks.

I have yet another quotation or two, to make from Mr. Luccock, but I, at the same time, assure my readers, it will be to their loss and disadvantage, should they content themselves with the information I have drawn from thence and from Mr. Bakewell, without having actual recourse to their books, both which differ, in a very material point, from many modern publications: like all precious things, they excel rather in solid, intrinsic value, than in bulk.

The following calculations are from Mr. Luccock.

In such, minute precision is always out of question, but they are doubtless sufficiently near the truth to satisfy curiosity, or to form data for a variety of purposes.

Total Value of English Wool.

245,290	packs of short wool at £15.	£3,679,350
137,228	ditto long ditto 13.	1,783,964
10,718	ditto lambs ditto 10.	107,180
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393,236	packs.	Total £5,570,494

Slaughter of short-woolled sheep is,	4,221,748	per ann.
Carrion of ditto - - - - -	211,087	
Slaughter of long-woolled sheep	1,180,413	
Carrion of ditto - - - - -	59,020	
Slaughter of lambs - - - - -	1,400,560	
Carrion of ditto - - - - -	70,028	
<hr/>		<hr/>
	7,142,856	

Number of lambs yeaned per ann.	7,002,802
Annual decrease - - - - -	140,054
<hr/>	
	7,142,856

The average fleece of England	lb. oz.	
nearly - - - - -	4 8	
Ditto short wool - - - - -	3 4	
Ditto long wool - - - - -	7 10	
Ditto stock per acre - - - - -	—	$\frac{19}{32}$ sheep.
Ditto long-woolled sheep - - -	—	$\frac{29}{19}$ ditto.
Ditto short-woolled - - - - -	—	$\frac{9}{22}$ ditto.
Ditto produce per acre long wool	8 0	
Ditto ditto - - - short	1 5	
Ditto ditto - - - long skin do.	0 5	
Ditto ditto - - - short ditto	0 4	
Ditto ditto - - - gen. skin do.	0 5	

Sauvegrain, Marchand Boucher à Paris, in 1804, calculated the number of sheep in France, at 80,807,600, the annual consumption one fifth, 26lb. per head. In Spain, with eleven millions of inhabitants, or one third of the number in France, fifteen millions of sheep. Bourgoing says, that the fine woolled flock called *transhuantes* 4,500,000, depopulate Spain, by travelling over wastes which should be cultivated. The war, and the numbers of sheep withdrawn from Spain, of late years, will have pretty well remedied that error. Last year, we find by the *Exposé*, that 600 Merino ewes arrived in France from Spain, and it seems that the French government have since obtained more. The Emperor Napoleon's flock at St. Cloud, consisting of 300 ewes and 50 rams of the highest blood, is said to be the finest out of Spain. The old contract for Spanish sheep, made by the French Directory (p. 449), was completed in 1807.

Of the fleece wool produced in England, rather more than one third is adapted to the comb; the remainder is wrought upon the card, and fabricated into different articles of woollen goods; to which must be added that proportion of skin wool, which is not long enough for the manufacture of worsteds.

Mr. Middleton supposes that the whole national stock of sheep is composed of nearly fourteen ewes to twenty-four others; that the former are killed at five years of age, the latter at three; and that the amount of those which die carrion, is equal to one twentieth of those which are slaughtered. It may be supposed, they have of late years been killed somewhat earlier.

It is calculated, but I think erroneously, that the number of lambs every season, is equal to that of the breeding ewes. One fifth of the lambs are said

to be slaughtered. Their fleeces amounting to eight ounces, on an average of the whole kingdom; they afford nearly three thousand packs of wool.

The grand total of wool produced in England and Wales, amounts to more than three hundred and ninety-three thousand packs, procured from more than twenty-six millions of sheep, and from thirty-two millions three hundred and fifty two thousand acres of ground.

The number of lambs yeaned in the kingdom, about seven millions; a like number of sheep and lambs slaughtered yearly, with an addition of one hundred and forty thousand, that the stock is diminished at the rate of two per cent. per annum.

Mr. Luccock supposes the flocks of England not so numerous as formerly, a conclusion, of the truth of which, I have strong doubts. But I have no doubt at all of the following; that, in England and Wales, we have yet more than three millions of acres, capable of being improved, and of carrying a more numerous stock; and that we have two millions of sheep, the fleeces of which are scarcely wool, but which might be brought to contribute their share to support the woollen manufacture, and to increase the wealth of the country. The short wool of England is still in a wretched state, for although some noble efforts to improve it have excited emulation and activity, yet when compared with what remains to be accomplished, little has been already effected.

When looking over the preceding table (see Mr. Luccock's book) *we are surprised at the number of sheep in every district, which might be exchanged for a better stock; and of the fifteen millions of short-woolled sheep, there are not five hundred thousand, the fleeces of which border on perfection. The whole race of heath sheep must be banished from the northern*

counties, where they greatly abound, or must change the nature of their staple, before the wools of England can be pronounced only moderately good. Where they range, the fleece is positively a disgrace to the sheep, its shaggy staple is most fitted to the goat, to the ages of barbarism, and to counties where wool is in no estimation. These heath croppers are said to be retained, because their constitutions are hardy and their mutton delicate: I will venture to affirm, that the first topic is ill understood, and that the cover of a good fleece would, in no sort, detract from the excellence of the mutton. I will agree, that in one respect, the apprehension with regard to crossing, has been hitherto well founded. Every long-woolled cross, the Dishley more especially, upon heath sheep, and there has seldom been any other, must necessarily have reduced the quality of the mutton, an effect which there can be no reason to apprehend from the Spanish cross.

To proceed to those general measures, without the adoption of which, as already stated, we can never arrive at the maximum of quantity and quality, either in wool or mutton, they are, *a universal substitution of the most productive breeds for such as mere local custom may have established, and the invariable habit of affording shelter to our flocks from the insalubrious changes of our climate, and providing them with food sufficient to keep them in a healthy and thriving state, throughout every season of the year.* In fine, less desire to possess animals *hardy*, coarse and wild, and proportionally unprofitable, than solicitude, by diligent attention and well-merited expense, gradually to improve them to their ultimate worth. This proposition may, at first sight, wear the appearance of a mere copy of that which I have been, for some years, reiterating and forcing upon the attention of the

keepers of sheep, but on reference it will be found, that I have before spoken generally, and with a degree of reserve and doubt, from which subsequent inquiries, observation, and reflection, have completely relieved me. I am at length thoroughly convinced, that the sheep husbandry of the British Isles is, in one most important point, equally erroneous, as at variance, with that of every other civilized country, ancient or modern.

The success which attended my former recommendation of the Row Culture for white corn crops, was materially promoted by the then scarcity and dearness of seed wheat. Our misfortunes sometimes may, and ever ought, with all possible assiduity, to be turned to our benefit. I again address the agricultural interest, under a similarity of circumstances. The present extraordinary value of clothing wools, and the actual realization of our apprehensions of a stoppage to our supply from the continent, ought, and I trust will, have the salutary effect of stimulating our exertions to the needful pitch of improvement, and to the full attainment of that independence on foreign supply, which Saxony and other states have long enjoyed, and which is equally in our power.

Notwithstanding the most plausible and even the most powerful commercial reasons, it must ever be sound policy to promote the home growth of articles of prime necessity, or of high value and extensive use. We have read the arguments of political economists of former days, in favour of purchasing in foreign countries, the greater part of even our bread corn, rather than grow it at a higher price, and of the balance in favour of this country which would result from a more profitable application of its capital than to agriculture; but how have such arguments stood

the practical tests of succeeding times and circumstances? If ever doubts have existed, that subject will no longer admit of controversy, nor does there seem at present the smallest disposition remaining among us to controvert the policy, or even the necessity which exists of extending the growth of our fine wool to the utmost limits of national demand. With respect to present prices, intrigue and speculation have doubtless been upon the alert, or as we may not improperly say, upon duty, and those exorbitant figures which have been named, may be looked upon, as merely nominal; but I was informed by a dealer, on the 7th of this month, March 1809, at Lord Somerville's public dinner, that both imported Spanish and English grown pure Spanish wool had been really sold at 26s. per lb. and trinded Ryland wool at 12s. per lb.

It would be needless to repeat the immense annual losses of sheep incurred by winter exposure, in the northern parts of our island, and in Romney Marsh in the south, or to exhibit in detail, the frightful example of the last and preceding seasons. The public newspapers, and the account books and feelings of the sufferers, form a very sufficient reference. Perhaps it is equally needless, considering the state of public opinion, to make an appeal to humanity in the case, to which, however, I am irresistibly impelled. I fully concur in the right and expedience of taking the lives of animals, but hold it to be gross inhumanity and barbarous injustice to inflict tortures upon them, in whatever manner, or on whatever pretence. And I cannot look upon the exposure to a lingering death by famine, storm, and cold, of harmless sheep, for the power over the lives of which, we owe at least protection and fair treatment, but as a flagrant breach of humanity and justice. It is vain to plead the exam-

ple of Nature herself, the plea is not apposite, and analogy would carry us too far. A man has bred up a multitude or flock of innocent and useful creatures, and kept them throughout the summer, in a state of fulness and luxury; he views them in the autumnal season in good plight, frolicksome and gay, and with the utmost *non chalance*, says to himself, should the approaching winter prove severe, a great part, one quarter, perhaps even more than the half of these sheep, will perish from the extremity of the weather. He will nevertheless expose them to this cruel risk, on a suppositious balance of profit and loss. He prefers the risk of a bad season, of mortality, and of purchasing spring food, to the certain expence of making provision for the winter. I do not hesitate to declare, that in my opinion, money thus saved, is not honestly gotten, because the sheep have been defrauded of their due sustenance and protection, and that if justice is not due to brutes, neither is it due to men, but that interest is all in all. I must own, that my feelings have been outraged at the stories of former days, which I have been told, of our northern brethren; of a man, for example, walking, without compunction, or without any other feeling than that of injured interest, over the carcasses of his famished ewes, at the teats of which living lambs were tugging to support nature, and of his chasing and worrying with savage dogs, his poor starving sheep from the kail garden, whither they had stolen to crop a morsel of greens, which might intervene between them and death! I even fear, that I may not be allowed the privilege of the term former days; for Hall, in his late entertaining travels in Scotland, relates such instances of gross inhumanity in the Highlands, as of horses eating off the tails and manes of each other, in their winter exposure, and even biting out the eyes, from

famine ! Similar damnable and revolting cruelties are recorded in accounts of the husbandry of our fen districts. For the honour of northern humanity, I trust such barbarous habits are giving place to increasing light, and to the influence of superior examples. But I am too sensible, that arguments of this nature must be short, and be postponed to those of another class, which will have a better chance to *interest*. I shall nevertheless prove, that, in this case as in all others, the fairest is the best policy, to the end of the lease.

To begin with mountain districts and the worst kind of exposures. I refer the reader to what has already been said in my former pages, with the assurance that my positions have been confirmed by every inquiry that I have had the opportunity to make. It seems to be generally agreed, that wherever in Britain, flocks of sheep are summer kept, there is a possibility that winter provision might be raised for them, subject to the condition, that their proprietors chose to break through an old custom, and put themselves to the trouble and expense. The only question is, would sheep repay this expense ?—and there is an objection which appears to maintain a strong hold, being grounded in ancient prejudice, namely, that the luxury of occasional shelter and winter provision, would gradually undermine, and in the end, totally destroy the peculiar and admired property of the heath sheep, their hardiness ; and render them too indolent to labour for their living. To be sure, it would be a lamentable thing, for a man to have his sheep too full of flesh in the winter season.

It is however yet more unfortunate, that men will generally persist in the opinion of the superior utility of any customary practice, merely because it is such, and without submitting their practices to the test of experiment, which may generally and satisfactorily be

effected upon the small scale, at so little cost and labour. Now, with respect to the present question, every judiciously conducted experiment of affording shelter and winter provision to sheep, has proved successful, that is, far superior in profit to the ancient practice of exposure. The prominent feature of the improved sheep husbandry of every mountain district, is the culture of winter provision for live stock. However ordinary this provision, whether it be fog, or hay or straw, or roots or heath, a reserve of it will still be superior to the miserable and scanty portion of the roots of herbage which sheep are compelled to scratch up from beneath the snow, for their precarious subsistence. Supposing that number must be reduced, all really experienced men will agree, that the profit upon the small number well kept, is generally superior to that of the greater, neglected. The proprietor's apprehensions are set at rest and his mind at ease. If of small property, he no longer dreads the risk of an absolute wreck, a catastrophe formerly of such frequent occurrence, and which ought to be an object of deliberation with every landlord. It appears to me self-evident, in the first place, that where sheep farming will at all return a profit, the improved practice must be at least equally profitable, with the important addition of insurance of that profit; in the second, that prevention of mortality and disease, number preserved, and good health, condition, amelioration and increase of quantity and quality in both carcase and wool, more especially at the present prices, must greatly outweigh the cost at which they are obtained. Winter provision is a branch of cultivation which always pays, and is connected in various ways with the general improvement of the country. There is then nothing wanted, but impartiality and activity of mind. Go, indolent, bigotted and hesi-

tating mortal, read Robinson Crusoe, and the wonders achieved upon the waste, by individual British labourers.

I propose only occasional shelter for sheep, from storms and wet, and that the sheep be accustomed thereto by feeding. That they be suffered or driven to range, when and wherever there is opportunity and quantity of any kind of subsistence worthy of search, and without injury to their condition, with the view of economizing the winter provision, but that their desire of being fed and sheltered, be not too much discouraged. That all practicable opportunities be afforded of drying their fleeces, and that a mean be observed between close coting of sheep and absolute exposure, an important object, which I know by experience to be attainable; nor are any animals better able to encounter the vicissitudes of the weather, than those which enjoy the benefit of occasional shelter from its extremes, in straw-yards, folds, and open sheds. As to the extra trouble and cost of these measures, they belong to the species of beneficial projection, from which, in a populous and cultivated country, there is a spontaneous and abundant repayment, and surely the labour and attendance ought not to be objected to in Scotland, where, in some parts we are told, "care is taken to rub the fatting oxen well with old curry-combs and brushes, to remove their dung, and to give them fresh litter, at least, twice or thrice every day, and oftener if necessary." I shall now bring forward some experienced and respectable vouchers.

On plantation shelter and the tree-fold see p. 86, and the Index for the various pages, in which I have formerly discussed the subject of exposure and shelter. Hogg, the poetical shepherd of Ettrick, who I hope is now happy in the possession of his Highland

farm, which he so richly merits, says in his book on Sheep, p. 123. "I hold it an invariable rule, that the preservation and nourishment of the bodies of his animals, must always be the farmer's first care, and other improvements will follow in course." This experienced shepherd of the bleak regions of the North, recommends clumps of firs, and "fences raised of stone, in the form of a complete circle or octagon (the latter not being so apt to *rush*) with a door in it, at which the sheep may go in and out. This door should always be made to face that place, near by which there is good natural shelter, from that particular point to which the door looks, for there is no mountain pasture, that is not sheltered from some *airth*, and this will render the round and its vicinity secure from all quarters. There is no kind of *stell*, as they are called, so safe as this; sheep are never *smored* (smothered by snow) in them, for the wind whirls the drift around them, and accumulates it in large pointed wreaths on the opposite side." Sheep, he observes, will come running to these stells, in a cold night, from every direction.

Hall informs us, that, when the late Earl of Fife began his plantations at Duff House, Bamf, there never had been a tree, from the idea that trees would not grow on that coast, so near the sea, but that now, every species of forest-tree flourishes there, even upon the highest grounds. The same of the Bishop of Landaff's plantations in Westmoreland. But it is not my intention to stop at these, either tree-folds or bare stone walls, but to contend for the addition of open, unexpensive sheds; reared against the stone walls, or earth banks purposely raised, as a support and security to the sheds.

After urging the propriety of using sheep gently at all seasons, and providing them with sufficient

shelter, the Ettrick shepherd continues p. 158. "The next great aim of the store farmer should be, to keep them in good and regular maintenances at all seasons; to lay no more stock upon his farm, than it is capable of affording nourishment to, at all times; and rather to err on the safe side, by keeping too few than too many. Indeed sundry sheep farmers have declared, in my hearing, that the fewer sheep they kept upon their farms, the more profits they made. An experienced wool-stapler will tell you precisely what farms are overstocked, *from the lightness of the fleeces, and coarseness of the wool.* Thus, if you lay sixty scores of sheep, upon a thousand acres, and the next year, stock it with only forty scores, the latter will produce you more wool and of superior quality; while the annual loss by various diseases is likewise prevented. On all farms that are subject to lying storms of hard snow, the farmer should be careful to raise plenty of hay. There is no farm, on which, by irrigation, or composts, a quantity of hay cannot be raised, sufficient to meet any emergency. But *as it is not needed every year*, it has been unaccountably neglected; though in many of the inland districts of Scotland, they hold the health and lives of their sheep on very uncertain tenures, from this one circumstance, while a good stock of hay would at all times, render any of them secure on that head. I have known on such an occurrence (lasting snow) 50,000 sheep all driven from their respective homes, and crammed into the lower parts of Dumfries-shire at once; where though the farmer was obliged to comply with exorbitant demands, on the part of such as let the ground, his sheep were often much hampered." He next describes the wasting and loss of the sheep, by driving out to keep and homeward, perhaps thirty or forty

miles, passing bad ways, barren or scant of keep, and over rivulets flooded and gorged with snow and ice, with the remark of a certain author, that the Scots have every kind of sense but common sense. "Certainly," says their rational brother of Ettrick, "the jest is very applicable to many of our Highland sheep-farmers, who are so careful to improve their breeds, and yet neglect this one thing needful, *to have always a stock of hay for the sheep*, and if they do not need it, let it be given to the cattle, or horses, next year, and let the hay of that year's growth stand." The idea above, that hay is not needed every year, is a most pitiful, starved and unfortunate one, and the chance to which these Highland farmers, the folly is not confined to them, voluntarily expose themselves, is too similar in its nature, to that glorious uncertainty, which a different description of persons embrace on speculation.

Mr. Hogg has made a quotation from this work, on the subject of the rot, but without stating from whence he drew it; inadvertently, I suppose, since he appears to have specified every other authority he has used. I make this remark for one or two reasons; the chief, because as I find, the Ettrick shepherd has read my book, I should have been gratified by his particular sentiments on the subject under discussion, and in an especial manner, by his approbation.

Dr. Smith, in his very able Survey of the County of Argyle, observes, it is allowed by good judges, that 500 sheep kept well, will return more profit than 600 kept indifferently. But that all are negligent in raising artificial grasses, or a supply of green food for the sheep in winter; which indeed could only be done by some, as the lands of others would not admit it. On the latter part of this may be remarked, that

if artificial grasses cannot, somewhat vegetable may be raised during summer and preserved through winter, wherever sheep can be summer kept.

Smearing or salving sheep and lambs in October, with tar and butter, is a general practice in Argyleshire. The purpose, is to defend them from the cold, scab and vermin; to increase the quantity and mend the quality of the wool. The better the quality of the butter, the farther it will go; and that species of tar, which appears of a *yellowish* colour, and rises when rubbed against a board with the finger, is to be preferred, as it is most easily washed out of the wool. *Some think that the operation might be performed when the sheep are shorn (much less expense and trouble) with butter or oil, and a decoction of tobacco, oak bark or broom, without any mixture of tar, so hurtful to the wool.* This decoction would kill the vermin or their eggs, and the butter or oil would improve the wool, the natural and sufficient clothing of the animal. For MARKING, are recommended—as much linseed oil to a pound of printer's ink, as will, when well worked together, bring it to about the same degree of thickness as house paint. Or, according to Dr. Lewis, melted tallow, with so much charcoal in fine powder, stirred into it, as is sufficient to make it of a full black colour, and of a thick consistence. To make it still more durable, a sixth or eighth of its weight of tar, might be mixed with the tallow.

The *braxy*, that fatal disease of sheep in the North, of which the dead were accustomed to be brought home, successive mornings in October and November, by cart loads, from large flocks, Mr. Culley affirmed, on forty years experience, was to be prevented by good keep. “I will be bound for it,” said he, “that better keeping will prevent the *braxy*, as they call it.”

The winter losses of sheep, in the South, in Romney Marsh, Kent, for example, are peculiarly disgraceful, from the natural richness of the soil, the ability of the flockmasters, whose weighty purses are equal to any improvements, and from their favourite situation and proximity to the grand mart for all commodities. If these will run the risk, with such facilities of providing an ample store, it truly affords some colouring of excuse for those, who labour under real difficulties in the premises. Were it necessary to curtail the number of sheep kept in Romney Marsh, which it is not, under a judicious system, the smaller number well kept, as every where else, would return the greater profit. A reserve of land should be made, both for hay and fog or kept grass, and roots afforded from the arable land. The risk winter system is too nearly allied to *all covet all lose*. Often the marshes are eaten too close and bare, in the autumn, whence the roots are so chilled during the winter, that the grass is very backward the succeeding spring—vast numbers of sheep perish by the *hunger rot* in severe winters, and the survivors being weak and low, from the same cause, many of these also are lost from the disorders attendant on full feeding in the spring, the whole flock being to a certain degree affected, and incapable of ever attaining their utmost proof. I have heard of repeated experiments, in which the results were, that with hay, or hay and turnips, a flock has been carried safely and in good condition through a severe winter, without the loss of a single sheep or lamb, whilst a great number of the sheep, and one half the lambs of a shifting flock, have been lost. The ewes should not be suffered to lamb in the marshes, but in sheltered parts of a farm. Indeed, the mode of management for the Marsh, which I recommend, would greatly interfere with the

profits of the lookers, whose perquisites consist of all the mort sheep and lambs, another very impolitic practice in my opinion.

In few words, I WOULD HAVE SHEEP WINTER FED, TO THE DEGREE OF COMMENCING THE GRASS SEASON, IN GOOD STORE ORDER, AND WITHOUT HAVING SUSTAINED ANY CHECK, IN CARCASE OR WOOL; AND WINTER SHELTERED IN YARDS OR SHEDS, AS MUCH AS THE SHEEP THEMSELVES MAY AFFECT, THROUGHOUT EVEN THE MILDEST CLIMATES OF BRITAIN. Our honoured agricultural father, Arthur Young, from whom, in the course of his long and active life, the husbandry of his own and other counties, has received so many substantial benefits, some years since, pointed out the great annual profit which would result from the improvement of our national stock of sheep, even if only to the amount of one shilling a head, stating the number at twenty-five millions. Granting that the stock may be increased within the next seven years, to the aggregate of thirty millions, or whatever may be the number, less or more, within that period, I do confidently aver, that by the means of improvement just stated, it is obvious, their worth may be augmented to the amount of five shillings each, on a very moderate calculation; an additional annual acquisition proffered to us gratuitously, by our bountiful soil and improved science, of nearly EIGHT MILLIONS STERLING, in mutton and wool.

I wish to see the whole race of *hardy* sheep, the term *mal entendue*, extirpated from the soil of this country. Instead of a race, hardy, wild, starved, comfortless, rotting, and thinly clad with the shaggy, coarse, open coat of the goat and the wolf, let us substitute upon our mountains and plains, a well-fed, cultivated sheep, with a comfortable and sufficient inside lining of nourishing food and the external defence from the cold, of a thick, close and valuable

fleece; his health and strength and *real* hardiness supported by shelter, whenever Nature may point out to him the need of it. Let us hear no more, the distressing and disgraceful accounts of numbers of sheep perishing under the snow, but the exulting and emulative relations of numbers preserved, and of the superior activity and merit of individual flock-masters, in their plans of winter preservation. While the old notions of hardiness prevail, and that sheep must be starved within an inch of their lives, and exposed upon barren heaths and dirty fallows, in order to render their wool fine, there can be little hope of that high degree of improvement, to which this country ought to aspire. For neither Merino nor half-bred Merino lambs, nor indeed those of any other breed, ought to be exposed without some kind of shelter, to the rigours of the winter and early spring; and the sheep when arrived at their maturity and full strength, will still require the same, with regular and good feeding, if it be intended to force the growth of their fleece, to its utmost weight, and to preserve the quality, in its highest degree of condition and fineness.

It is with much satisfaction, that I adduce some additional examples of the practice of enlightened flock masters, both in North and South Britain. His Grace the Duke of Buccleugh, in Scotland, an eminent improver, has constructed *stells* of dry stones, upon his sheep farms, several of which possess from eight to twelve of these conveniences. They are adapted to mountain and lofty situations, plantation folds being more used in the lower districts. The former are provincially distinguished, as black-weather stells and snow stells. The black-weather are also denominated c stells and y stells, the c stells being in the form of semi-circles, the others constructed with three limbs, similar to the three legs upon an Isle of Man half-

penny, so that from whatever quarter the wind may blow, the sheep can lie sheltered behind them. The old form of the square, in the snow stell, is now discarded, as liable to fill with snow, and rounds or circles, of various sizes, are in general use. Dimensions from five and a half to seven feet high, and thirty inches to three feet in the bottom, to sixteen or twenty inches at the top; and from fifteen to twenty-five yards diameter, according to the size of the flock. They are said to be equally durable as useful, and having a wear, or long passage by which the sheep, enter the circle, to combine the advantages of the summer and winter stells, by affording shelter at all times from the wind and rain, and preventing the hay from being carried off by the wind. Now, as I have formerly stated, we have plantation stells in the South, but as these, otherwise great conveniences, want a roof, I do not understand how they can afford shelter from wet, either by rain or snow, a most important desideratum. A door is recommended at the end of the passage, next the stell, and a covered rack is in use, as in these parts, from which the sheep can eat their hay dry.

I am obliged to the Edinburgh Farmer's Magazine, for the above particulars, of which I shall make the following interesting conclusion, in the correspondent's own words. "Indeed it is impossible to calculate the advantages attending this mode of management, for the sheep are kept in places of security; they have the power of hay when the ordinary pastures are locked up, *and the shepherd and his master can sleep in comfort. Nor should it be forgotten, that the practice of flying to lower grounds, is thereby prevented, where they were half starved while away, half drowned in coming home, and the farmer's purse often wholly emptied.* In the year 1802 there was a general flying,

Every part of Annandale, Nithsdale, and the lower part of Eskdale, that could take in sheep, was completely filled from Crawfordmuir, Tweed-head, Yarrow, Ettrick, Eskdalemuir, the head of Tiviotdale, Ewis, and Liddisdale; and had the frost continued eight days longer, there would have been absolute starvation. One farmer in my neighbourhood, paid above one £100. that year, for snow-mail (joist, I suppose, in our phrase) and since 1794, some of the flocks have been five, and others six times away on the same disagreeable errand. Indeed the places, to which they flee, are becoming more shut up against them every year, by their extended enclosures; and this, perhaps, has contributed to the general adoption of stells, and of the different modes of raising hay. For if a stone weight of 24lb. avoirdupois, be barely sufficient for a score per day, what must the quantity requisite for a large farm be? Generally speaking, the farmers never consider themselves as completely safe, unless they have a year's hay before hand, which, if not needed for sheep, can be eaten by black cattle." The Duke of Buccleugh has the honour also of being the only proprietor in Scotland, who has introduced the great improvement of irrigation, extensively upon his estates, having between the years 1795 and 1805, formed 42 meadows, containing 415 English acres of land. In order to draining the sheep walks upon his Grace's farms, it was necessary to widen the course of the rivulets, but as these, when swollen after a storm are too wide to be passed by the flocks without danger, bridges are constructed over them for the safe passage of the sheep and lambs and the shepherds, consisting of two planks laid across, covered first with brushwood, then with turf, it being sometimes found necessary to secure the permanency of the bridge, by land-breasts of wood or stone, or of both intermixed.

We are informed by M^rPherson, in his History of Commerce, that Mr. David Locke, merchant of Edinburgh, improved and increased the breed of clothing-wool sheep in Scotland, as the natural staple of that country, asserting that millions more sheep might be raised, without encroaching an acre on corn or cattle land. This Scottish patriot died in 1780.

I have before adverted to the successful keeping of Spanish sheep, in the northern parts of Scotland. The experiment was made as early as the year 1792. Malcolm Laing, Esq. M. P. the faithful and enlightened historian of Scotland, has, upon his farm in Orkney, a flock of Spanish sheep, originally derived from Sweden, and, I believe, a Spanish ram from France. Mr. Laing crosses the Shetland ewes with the Spanish ram, and also the South Down ram, which latter cross produces a total change of form. He, last year, showed me samples of his Merino wool, which was of a quality equal to the manufacture of the finest cloths, and his mixed wools in proportion. I understood it to be Mr. Laing's determination, to adopt the plan of winter shelter and of well winter feeding his flock.

In Cumberland, the Workington Agricultural Society, President, the patriotic J. C. Curwen, Esq. M. P. have introduced the Spanish cross. I hope to be informed, that they have also recommended the necessary winter precautions.

Page 291, I have characterized the system of sheep management adopted in the Midland counties, and with truth, as the most liberal and judicious to be found in Britain. I have since noted, in Mr. Pitt's Survey of Leicestershire, an interesting account of their sheds in the fields, for protection of the sheep; and the adoption of a railed convenience for the confinement of the ewe, that she may not baffle and

exhaust the ram; an expedient which I have formerly recommended for the cow, as well as the mare.

The following, on winter management, is a degrading contrast. Four or five hundred head of deer, are stated by the public papers, to have perished in Salcey Forest, Notts, since November, from the severity of the season. And in a published return of the number of deer in Windsor Forest, in 1806, then only 318, not one third of the number which were there fed in 1731, it has been stated, that although there is a range of 24,600 acres—"the deer in almost every walk of the forest, except one, are all nearly starved; many actually die of hunger, and the surviving does have not strength to rear their fawns." Is it then nobody's business, to protect these valuable animals?

I have spoken also, of the straw and stubble walls of my native county, Essex, to which I may add with much use and point, the following quotation on SHEEP YARDS, from Mr. Secretary Young's late most complete and satisfactory Survey of that County. "One of the completest sheep-yards, I have seen, is that which Mr. Thurlow has made at Gosfield: partly by means of stubble stacks, but the space well inclosed; a large flock may be under cover or exposed, at their pleasure: in the centre, is a thick stubble stack, which forms a double shed. He finds it of incomparable use, insomuch, that he intends thus to convert all the straw of his large farm into dung, and to leave off buying bullocks for that purpose. This is the only sort of folding he admits of. Mr. Blythe of Kirby, has a yard also, in which his store sheep are confined every night. He highly approves the system. Many other sheep-yards are forming in the county."

"Mr. Rogers of Ardleigh, I found making a sheep-

yard, having a high opinion of the system: he had fixed on a scite, and built a range of sheds on two sides, as a fence to it. Carts earth as a foundation and litters upon it." Many such accounts are to be found in the Survey. It is an ancient practice in Essex, where most agricultural improvements were introduced in their earliest stage, particularly the row culture from the original disciples of Tull.

"The late General Murray's standing folds were equally well contrived, inclosing an area of 57 yards in length, and 20 broad, containing 1140 square yards; above 700 ewes were folded in it at night, and for that number it is more than a yard and half for each sheep. All around it was a shed, nine or ten feet wide, and also across the middle, which latter was open on both sides. A rack for hay placed against the wall, which was boarded, surrounded the whole; and another which was double, to be eaten out of on both sides stood along the central shed; under the rack was a small manger, in which the food was given." The Rev. Arthur Young's Sussex.

Mr. Hill's separating sheep pens have *sliding gates*, from one to the other: he remarks, that when a pen is full of sheep, the gate cannot be opened with convenience. Young's Norfolk.

Mr. Reeve is clear in the fact, that, if sheep, whatever the breed, are driven by foul weather to a hedge, there is the proper place for them, and not by penning, left to abide the beating of the storm. Norfolk.

FOLDING. Mr. Hill has experienced, that folding lessens the value of the lambs, considerably; they do not bring so high a price as others not folded. The ewes also, which lie still and quiet, free from the labour of the fold, are in doubly better condition. "In regard to the effect on wool, Mr. Hill is clearly of opinion, that folding does not make it finer—it makes

the fleece lighter, but never finer." Of the truth of those remarks, I have long been convinced. Among the old prejudices respecting wool, a strong one did, and does still exist with recluses, that folding upon arable land, materially promoted the fineness of the fleece.

The principle and general mode of practice being established, on which we are to arrive *gradually*, at the maximum of quality and product, in our national stock of clothing wool, namely by the Merino cross and by the due conservation of our flocks, it is time to attend to those preliminary steps which may appear most within the verge of immediate practicability.

Merino tups are, in course, universally recommended. But it is plain enough, our stock of those is at present very inadequate to any extensive breeding plan. The next in value, are the full bred Anglo-Merino, from a sufficient number of crosses of the Spanish ram on our best English breeds. Then follow those with certain portions of Spanish blood, and our best native fine woolled sheep, the Ryelands and the South Downs.

In order that no delay be made in the career of improvement, I apprehend it would be advisable to commence with putting in requisition, tups of all the above mentioned varieties, pure Merinos being resorted to for the perfection of the stock, as quickly as they can be procured. The certain demand for these last, their prime importance, and consequent high price, will assure a supply of the purest blood, which will be preserved entire, like that of our race horses. I shall say a few words in this place, on certain popular notions respecting the disadvantageous form of Spanish sheep and the solicitude they have generally occasioned. Granting a disadvantage at the outset, which is yet suppositious, since no experiment has ever been

made, it is but a temporary tax to be defrayed by the improvement of the wool, the regular good keep of this country alone will, in the course of a few generations, produce larger size and a more full and comely form, whilst breeding skill and judicious selections will assure our conventional symmetry, or just proportion of parts. His Majesty's old flock, which has been kept on very short commons, from the prejudice of the shepherds, that good living would render their fleece coarse, is notwithstanding that disadvantage, a striking example of improved size. An eminent and universal proof of assimilation to the form of our country, is to be found in all the mixed Spanish and English breeds. This of form, is a topic undeserving of another moment's solicitude.

I have supposed that the Agricultural Societies of the fine wool districts, might undertake for the supply of proper tups, and should any such district be without the advantage of a Society, the present ought to be a very sufficient ground for the immediate convocation of one. If thought necessary, and more conducive to certainty and expedition, each Society might establish a subscription flock for tup breeding. In the present state of things and under the obvious necessity of acting in some mode, little doubt can be entertained of success; the present price of wool is an infallible remedy for the strongest prejudice, and will render the dullest apprehension alive to the feelings of interest.

Little remains to be said as to those parts of the country, which are the theatre of improvement, or of the appropriate breeds. Scotland, both the North and South West of England, and Wales, possess breeds peculiarly adapted to the Merino cross. An immediate commencement should be made with all Heath sheep, which should be crossed with South

Downs, until Merinos can be procured. The sandy uplands of Lincoln and Cambridgeshire, would in all probability, pay the sheep feeders far better than they are at present paid, if fed by Merino South Downs. The same may be affirmed of Norfolk, Wiltshire, and Dorset, the latter breeds producing by the Merino ram, stock large enough, one would suppose, to fill the eye of the most devoted to size. Having the calculating materials before me, I could with much facility, present the reader with a very plausible account of the number of rams which will be wanted, to complete that improvement so much desired by all real friends to their country, with a shrewd conjecture at the length of time which must pass, ere we can see our wishes realized: and all this would be far more easy, than to tell where the needful number of rams can be procured. The most important speculation, however, in the business is this; we know, with the utmost certainty, the plan to be equally practicable as beneficial, but that we must allow the necessary time and pains for its completion. The mass of materials upon which we have to work, is immense, and may with industry, in a few years, be made to produce immense and incalculable returns. However I was disposed to treat lightly (page 284) the extraordinary increase of animals from one, or a few couples, as applied to this country, our present circumstances have imprest such speculations with a degree of consequence.

Our only *deficit* now, is in point of quantity. Pure home-grown Spanish wool, equals the finest imported Spanish, in all respects, and that not in rare and picked samples, but generally. The same may be pronounced of the cloths and kerseymeres. In the opinion of Dr. Parry, on which I shall by and by make a few observations, still more may be said in

favour of Merino-Ryeland of the fourth cross; that such is even superior to the pure Spanish of either kind. And with respect to carcase, the cross produces a decided improvement both in size and form. The produce of the Merino cross on the South Down, assimilates itself to the form of the latter, equalling that celebrated stock in weight, proof, and excellence of mutton.

It is yet a curious fact, that our noble and munificent host, Lord Somerville, at his eighth anniversary show dinner, should have to defend the lately defamed character of Spanish mutton, against a few solitary libellers of all good taste. However, *de gustibus non est disputandum*. In plain English, a man may prefer neck beef to a slice of the sirloin. With respect to my own relish of Spanish mutton, heretofore so gravely described, it has in seven years, suffered no alienation. This remark I have farther to make, I have never heard any man complain of the quality of Spanish mutton, but he who never tasted it. I shall now adduce some new examples in reference to the above topics, and to wool and cloth.

In the printed letter of June 1808 to the Lord Marquis of Titchfield, of that respectable breeder and zealous advocate for the Merino improvement, Benjamin Thompson, Esq. of Redhill Lodge, near Nottingham, will be found some very important information, relative to the introduction of the Spanish cross upon the forest breed of that county. Mr. Thompson gives the following account (page 12) of the produce of a forest ewe, by a Merino ram. "I selected her from only half a score, so that she cannot be supposed the best of her kind. Last year she brought me a lamb, unusually late, namely not till the middle of June, consequently the expectation of a hog's fleece, being heavier from its usually carrying a growth of

about fifteen months, would not in this case be justified. In fact, the dam's fleece and the daughter's were both just the growth of a year; but let us examine the effect of one cross by the Spaniard. On my shearing day (13th June) the forest ewe yielded two pounds, eight ounces of wool; her daughter four pounds. At last year's valuation therefore, the foresters fleece was worth five shillings, and the hog's, according to actual sale, twelve shillings. These, and many other observations convince me, that the Merino forester may, under judicious management, be made one of the most useful sheep in the kingdom." Page 16, it is stated, that at the late Holkham meeting, a three shear Merino-Ryeland wedder, bred by Mr. Tollet, was slaughtered, which weighed thirty-three pounds per quarter. And that Lord Somerville has had yearling Merinos weighing seventeen pounds per quarter. To this may be added, that pure Merino two shear wedders have of late, reached eighteen pounds per quarter, and Merino South Downs, currently, twenty, twenty-two and upwards. The form of the pure Merinos is susceptible of the highest improvement, as is evident in Lord Somerville's famous ram, No. 20, and many others which I have distinguished in his Lordship's flock. Mr. Thompson's Merino-Ryeland wedder of the first cross, three shear, carcase weighing 87 lb. with 18 lb. of rough fat, wool three fleeces 17 lb. 2 oz. sold at 3s. per lb. produced a return of £5. 11s. 1d.

But this gentleman has, I believe, just published an account of a cross of the Spaniard, upon a Dishley or New Leicester ewe, an experiment which I proposed as matter of curiosity, but had never until now, heard of its being carried into execution, excepting by a friend in Suffolk, from whom I did not learn any particular result. Mr. Thompson informs us, page 21,

that—"Mr. Hose, a considerable grazier at Melton Mowbray, has crossed several of his Dishley ewes by a Merino ram, with decisive success. I lately requested this gentleman to send me a few fleeces of the half breed, which I put into the hands of my neighbour Mr. Hawksley of Arnold Works, enquiring what was the present value of such wool. His answer, accompanied by the payment of eighteen pence per lb. for it, is as follows:—We will give this price for two thousand tods to-morrow, and take a hundred tods weekly by contract at the same price, for seven years certain."

Mr. Thompson continues—"Now eighteen pence per lb. is, I believe, nearly twice as much as can at present be obtained for pure Dishley wool, and the latter breed of sheep produce little more than Merino-Dishleys; for though the Spaniard shortens the staple in a great degree, he materially thickens the pile in return, so that every fleece is nearly double in value. The loss we are to look for, then, is in the carcase, and this is infinitely less than will be at first supposed. It seems indeed, to be now very generally agreed, that, in sheep, the sire operates principally on the fleece, and the dam on the carcase, which is fully illustrated by Mr. Hose's Merino-Dishleys, they being superior in form to any that I ever saw with Spanish blood in their veins, and having lost little, if any thing in size. I have thought it right to throw out these hints, because I am assured that many Leicestershire breeders have the clip of one, two, and three years on hand; whereas Mr. Hawksley's note seems clearly to prove, that one cross of the Merino would have made their wool immediately saleable at a great advance of price, while no deterioration of consequence would have taken place in the carcase. The subject is, at all events, worthy of farther investigation."

Assuredly, Mr. Thompson deserves the thanks of the country, for the above information, which may lead to important results. With respect to the peculiar influence of the male or the female, on the progeny, I have spoken to it, in a former page of this work, without any very submissive deference to the popular opinion. The loss of size in the Merino-Dishley cross, is a natural result, perfectly independent of the idea of deterioration. As to the flesh, nothing can be better calculated than a Spanish mixture, to remove the natural insipidity of New Leicester mutton.

The concluding pages of Mr. Thompson's letter, contain an account of a great variety of specimens of wool, cloth, kerseymere, stuffs, stockings, yarn, dyed Merino sheep's skins and hats manufactured from mort Merino-Ryeland wool, presented to the Noble President of the Newark Agricultural Society. Mr. Thompson has also furnished from his own inspection at Kew, the first account which I have seen of His Majesty's last importation of Spanish sheep. This may be found in the Agricultural Magazine for the present month, March 1809, in which publication he has also both ably and facetiously, defended the Spanish cross. The King's new flock consists of 100 Paular Rams—1400 Paular Ewes—350 Paular Lambs—50 Nigretti Rams and 120 Nigretti Ewes. By a careful examination and comparison of thirty specimens, Mr. Thompson has confirmed the reputed superiority of fineness in the Paular, over the Nigretti fleece, and that which is of far greater consequence, the improvement of the Nigretti wool from the soil of this country.

This improvement, I have observed within the last seven years, to be progressive; the same effect has been perceptible in the cloth manufactured from the wool of the King's and Lord Somerville's flocks, of

which I have occasionally obtained samples. My general mode of determining the superiority of fineness and goodness in specimens of wool and cloth, has been by submitting them to the judgment of persons in the trade, but that on which I find most reason to depend, as to fineness, is the medium of young and good eyes, assisted by the magnifier, for I have found very little of certainty or agreement in the former method, and am convinced that decisions not entirely to be depended upon for correctness, have often been made.

I have, more than once, had particular occasion to remark the same occurrence which Dr. Parry describes. A dealer has been unable, among several specimens of superfine cloth, to point out that which was manufactured from imported, or home grown Spanish wool, or full-crossed Merino-Ryeland; often preferring the latter, very seldom, the first. I lately exposed the following patterns to one, who ought to be as capable a judge of cloth, as any man in England, and who was formerly convinced of the utter impossibility of growing fine wool in this country. No. 1. given me by *himself*, two years since, as the finest pattern of cloth which London could produce, and made from imported Spanish wool. No. 2. Lord Somerville's cloth manufactured, I believe, in 1806. No. 3. A late and very beautiful pattern of Dr. Parry's Merino-Ryeland cloth. The judge instantly threw aside No. 1. as totally unworthy to stand in the competition! giving the preference to Dr. Parry's specimen: but on a final examination, declared, that he thought Lord Somerville's pattern somewhat the finest and the fabric most substantial, the other wearing the face of a beautiful lady's cloth, in appearance like those made from Saxon wool. Another person first gave the palm to Lord Somerville's specimen, but finally to that of Dr. Parry.

But the cloth, which in consequence of my inquiries, has attracted the most general approbation, for fineness, silkyness and substance conjoined, is a dark green, from Lord Somerville's wool, manufactured since the above specimen.

The reader will discover in the above and preceding information, a complete and final decision of the question. It turns out moreover, to be the general opinion of the trade, that excessive fineness and tenuity of the woolly fibre, is by no means of indispensable necessity for even our best fabrics, so much depending on the milling, stiffening and giving the finishing gloss in the manufacture. A draper shewed me two samples of superfine cloth, manufactured from the wool of the same person, and it was supposed from the same wool, but the difference in quality between the two was great indeed, which the draper ascribed solely to a difference in the manufacture. Such is the general opinion founded on known facts. The taste of the times is all for a fine, silky gloss upon the face of the cloth, which certain of the trade have informed me, the modern machinery is calculated to produce, but that the more simple hand labour of former days, produced stouter, if rougher cloth.

I entertain the highest respect for Dr. Parry, to whose long continued, patriotic exertions, the country is indebted for the perfection of the Spanish cross, upon our best English fine woolled breed, the Ryeland. And it is merely from a quick sense of that paramount public duty, speaking the truth as I find it, and not from any pitiful desire of cavil, that I am impelled to make the following observations. Nor have I the most distant idea, of impeaching the Doctor's accuracy, only of insisting on my own. Dr. Parry has invariably found the thorough, that is fourth cross Merino-Ryeland wool, superior in fineness and condi-

tion, to either the imported, or home grown Spanish. On the contrary, I never yet could procure a single specimen of the finest bred Merino-Ryeland wool, of equal fineness or goodness, even to the Nigretti, or inferior Merino, grown in England. My last experiment was subsequent to the examination of some lots of Merino-Ryeland rams. It was made from some wool of that description, of the highest character, in comparison, first with a specimen from a Nigretti ram, to which the Merino-Ryeland wool was at a glance, obviously inferior; but on a compare afterwards, with a specimen from a higher bred Anglo-Merino ram, the inferiority of the Merino-Ryeland wool, in point of fineness, softness, silvery gloss, firmness and elasticity of fibre, and other distinguishing features of the pure Spanish, was striking indeed.

But having also been convinced, as I have shewn, that the thorough Merino-Ryeland wool, makes beautiful and undeniable British superfine cloth, I am ready to acknowledge, that the above remarks I have made upon its inferiority in point of fineness, are of diminished consequence, any farther than they ought to go some way towards a persuasion of the expediency of preserving the thorough purity of the Merino breed; and such appears to be the opinion of Mr. Sheppard, in his excellent Memoir on the subject, in a late volume of Communications to the Board of Agriculture. I should indeed be gratified to find, that there are Merino-Ryeland specimens, superior to any of those which I have hitherto seen, and finally to be convinced, that the English stock is, or may be thoroughly impregnated and imbued with the most estimable qualities of Spanish wool.

But in what is to follow, I shall enter the list with the worthy Doctor, upon a subject although analogous, rather of pleasantry, and with somewhat greater ad-

vantage, for Dr. Parry is a far better shepherd, than a jockey, as I now undertake to prove. In page 475 of this work, with the Prospectus of the Spanish cross, I introduced the analogy of the Race-horse, expressing a doubt, whether a cross through a sufficient number of descents, between the bred horse and a mixed English mare, would produce a perfect racer, as I had already doubted, not decided, with respect to the Spanish cross, on our fine woolled breeds of sheep. Whether the analogy between *wool and running* be perfect, experiment only can determine; but the experiment with respect to the horse, were I thirty years younger, I should probably be mad enough to undertake, in the most roundabout way, namely with the racer and the most common bred, or cart mare. And I have smiled at finding lately, among my papers, a sketch of the gradations or descents in this experiment, through the course of I know not how many years, until the attainment of the full bred, mongrel bred, English racer! A late eminent sportsman, I am informed, noticing the above passage in my book, delivered it as his opinion, that racers might be so bred: I should not doubt the speed of such racers, but very much, that they would run home.

Dr. Parry in his Communications with the Bath Society (Vol. II. of their Letters and Papers) has pursued the above analogy, but from treating it lightly, and rather, I suppose, as a subject of pleasantry, than with his usual acumen and powers of investigation, has, to atone perhaps, for the failure of establishing his proposition, approached very near to a proof of its converse. At any rate he has failed to prove from the analogy of the race horse, that mongrel sheep will equal the pure Spanish, nor has he been a whit more successful, in proving English race horses, mongrels. And if I formerly affirmed in the Treatise on Horses,

that 'we could have no such thing strictly speaking, as a thorough bred runner in this country,' such position was merely on the speculation of our being restricted to Arabian and Lybian blood.

The Doctor has mistated the question *in limine*, by assuming, that we affirm the breed of race horses to be absolutely, instead of relatively, pure and original. No intelligent sportsman ever dreamed of such an absurdity. Every such one knows, that our thorough bred horse is derived from the South Eastern breeds, chiefly from Arabians and Barbs, which are deemed the originals, both from their superior form as coursers, and the greater attention which has ever been paid to their pedigrees, in those countries. Equally certain it is, that any admixture of this foreign racing breed, from the earliest period of the turf, the reign of Elizabeth, to the present day, with the common breed of this country, for the purposes of the regular course, has been rare and adventitious, and such chance crosses were soon washed out and obliterated by the full and constant flow of the current of southern blood. Such crosses besides, were never with the common indigenous species, but generally with three part, or seven-eight bred mares, and even in that case, and with the advantage that the produce raced capitally, its reputation was always sullied and degraded as breeding stock, as in the example of Sampson, a capital racer, and others. The plea of a regular pedigree for Sampson, would never avail, its want of foundation was fully apparent in the form of the horse, and perhaps is so in degree, to this day, in his most direct descendants, although nearly half a century has intervened since he was used in the stud. A speculative experimenter indeed, would find no small difficulty to persuade a turf breeder to breed from any but a true bred racing mare. I have more than once

myself used persuasions of that kind, in favour of one or two individuals, of which I entertained a high opinion; the answer was the old and usual one—after all our expense and trouble, we find it sufficiently difficult, to obtain a racer from the best bred stock, what possible inducement then, to breed from mares of imperfect blood? Nothing can be more erroneous than the popular notion, that the English race-horse is a mixed breed between the Southern and the common breed of this country. Our thorough breed is purely southern, to the degree above mentioned, and never fails to be deteriorated by any northern mixture.

It is a hasty observation (page 204 u. s.) that ‘in consequence of our commercial communication with Africa and Asia, we eagerly tried the effect of coupling males of the Turkish and Saracenic breeds of horses, with the mares of our own country, some time after the middle of the last century.’ The breeding of Eastern horses for the course, in this country commenced somewhat earlier than the reign of James I. Equally incorrect it is (page 205) that ‘no recourse has been had to Barb and Arabian blood since the time of the Godolphin Arabian;’ on the contrary, the list of foreign covering stallions, from every part of the East, has been very numerous since that period, and many of them have been successful; but granting such recourse unnecessary, it is by no means that *mongrels* have ever been found to answer our purpose, but because our racing breed is preserved pure. Sancho and Gohanna are then, not ‘mongrels,’ but beyond all dispute, of ‘full blood,’ that is to say, of blood sufficiently pure to assure its full share of characteristic qualities, any casual taint of former days being completely obliterated. I recollect no ‘deficiency or omission,’ in the female line of the

pedigree of Eclipse, but the very common one, a defect of information as to the last named mare; in Eclipse's pedigree, merely said to be a daughter of Brimmer. The possibility to be sure might be urged, that this said daughter of Brimmer had a cart or hackney mare for her dam, a fact however utterly improbable, from her immediate descendants proving real racers.

The 'war horses and chargers,' alluded to, page 316, were from a country in which the courser is of necessity put to the purpose of war, which it is now the fashion to do in this country, from choice. Turkish admixtures have been rare with us, within the last hundred years. The old race of Andalusian horses was purely southern, most probably Lybian. That race has been long since extinct; having been merged in the Spanish and other European breeds. The Doctor's experiment of two crosses from the forester and his consequent expectations, will excite a smile in the sportsman; and should the speculator really proceed until he reach his 'ultimate standard,' and produce a specimen thereof at Newmarket, or upon the Bath course, I will venture to predict, that he will not have any great reason to rejoice at his success.

I trust I may assure myself of the pardon of Dr. Parry, and of my readers in general, for riding this little race, somewhat perhaps out of the course; whilst I pull up and approach the ending post with this observation, that although I doubt not, racers might be made from an admixture of the Southern and Northern breeds, yet as little do I doubt, that the Southern would prove essentially superior: some such superiority, likewise, I cannot help predicating of the purer Merino sheep over the Merino-Ryeland. But of the constant equality of the pure Anglo-Merino, with the breeds of Spain, Saxony, or any other country, the past ex-

perience of a sufficient number of years, will not permit me to doubt.

I have now nearly exhausted the space which I can spare for this subject of wool, and I shall finish with some discussion of that well known question, the effect which gross and full feeding, or fatness in the sheep, has upon the fineness of the fleece. If I am unable to put the question to rest, I conceive I can advance enough, greatly to reduce its importance.

Lasteyrie avers that the fullest keep and highest condition of the sheep, increase the length of staple and weight of the fleece, without reducing its fineness, or deteriorating its quality, and Lord Somerville, I believe, holds nearly the same opinion.

The idea, that the fineness of wool is affected by the gross quality of the food, is perhaps at length, given up, with the farrago of kindred and groundless notions, which credulity had hatched and prejudice had brooded. But Mr. Bakewell, as we have seen, and Mr. Shephard, and indeed various others still maintain, that fineness of wool is in the inverse proportion to fatness of the sheep. Dr. Parry accedes to this opinion.

Without presuming to question the accuracy of others, I shall only state my own opinion, and the result of my own observations. The opinion of Lasteyrie seems to be countenanced by the facts, that Merino sheep on the continent, are close cotted and high fed, nevertheless from their wool, much finer cloths, in the opinion even of our own dealers, are manufactured in France and Belgium, than we can produce in this country. Lord Somerville, if I rightly understand his Lordship, has generally had wool of equal quality from his highly kept sheep, even those that were fed upon the marshes, as from his leanest stores. From the analogy of the horse's coat, so sleek

and fine, when fat, whether dressed or not, in or out of doors, and so coarse and rough, when in low condition, I have been ever led to expect the finest fleece upon a fat sheep; nor do I place much dependance on the supposition that the orifices or pores, whence the woolly fibres protrude, are more enlarged in the fat, than in the lean sheep, nor am I convinced that the reverse may not be more probable. I incline, as I have before stated, perhaps in one or two places, to the opinion, that from plentiful feeding of the animals, wool becomes of greater bulk, longer stapled, more silky, and loses a portion of its elasticity, and I adhere to the idea, that not improbably after a certain period of the naturalization of the Merino race in this country, occasional importation of Spanish or African sheep may be desirable, with the view of restoring and preserving the qualities of elasticity, firmness and soundness in our fine wool. Our Merino-Ryeland wool seems to me still more faint and soft, than our pure Spanish.

My last examination of specimens, made purposely to be here communicated was as follows. With the permission of Lord Somerville, I obtained specimens of wool from a fat and a store thorough bred Merino wedder, taken as they chanced to come to hand, from the flock at Chobham. The specimens were examined through the magnifier, by several persons having young and keen sight, and the decision was as under.

FAT WEDDER. Specimens 1 and 2—taken from the shoulder and breech.

No. 1. the shoulder specimen finer than 2 by barely two degrees or shades.

STORE WEDDER. No 3 and 4 from shoulder and breech.

No. 3. the shoulder specimen finest by 2 degrees.

It must be noted, that the difference was so slight,

that it required much steadiness and accuracy of observation, to determine, by placing single fibres, or hairs of wool, in opposition to each other, nor could the naked eye determine the point of fineness or tenuity, sometimes assigning it to one, sometimes to the other sample.

SPECIMENS 1 and 3, viz. from shoulder of fat and do. Store wedder.

No. 1. Shoulder fat, finer by two degrees than 3 Shoulder Store.

SPECIMENS 2 and 4. viz. from breech of fat and breech of store wedder.

No. 2. Breech of fat, finer by two degrees than 4 breech store.

The specimen from the fat sheep was fullest of yolk, and in all respects I apprehend the better sample. Mr. Cook, Lord Somerville's then steward at Chobham, immediately pronounced the same opinion, and also that he had invariably found the fattest sheep of the flock, to carry the finest wool. The above samples were of extraordinary fineness and beauty, yet I selected one from a young ram of the same flock, which was superior.

Granting that other comparative experiments of this kind, should give a different result, I believe such difference in the quality of the wool never will be found of sufficient magnitude to affect the cloth manufactured from it, in any very perceptible degree; and from what I have hitherto seen, I despair of finding any connoisseur accurate and discriminating enough, to decide whether a piece of superfine cloth has been fabricated from fat or lean wool. Besides, who has ever heard of such an occurrence, as a fabric being injured in fineness or quality, from the Merino wool of which it was composed, being shorn from a fat sheep? Not to omit the opinion of many manufac-

turers, that fineness in the wool, is not exclusively the object, so much depending on the manufacturing process. The question thus dwindles to matter of mere curiosity. Since then, good keeping the flock makes a weighty fleece, without injuring the quality of the wool, and bad keeping returns a light fleece, sometimes of inferior quality, the road to profit is obvious. But even should future experience prove a superior fineness in store fed wool, it will be an easy matter to keep it separate, and equally easy it may be affirmed, to dispose of that which is second in quality.

The term Merino, or Marino, I have somewhere observed, was applied in Spain, to their fine woolled sheep, as not being indigenous to their country, but obtained by the sea; whence the term is equally appropriate with us.

NEAT CATTLE.

OX-LABOUR. Every thing which has occurred to my observation or inquiry, tends to confirm my former opinion of the superior profit, public and individual, of employing oxen in farm labour, and of the real cause of their being neglected, which is two-fold, the established custom of using horses, and the difficulty, in many parts, of procuring the proper breeds of oxen. I have obtained good working cattle for several friends, but their ploughmen would not allow of the use of oxen!—Six millions of acres of the best land in this kingdom, are said to be devoted to the support of horses.

It is also, I am convinced, the mere result of a savage and barbarous habit, that oxen are mauled and affrighted to death, too often gradually, by knocking on the head, instead of being *laid* gently and unaware, to rest, by Lord Somerville's method of *pithing*. The scientific defence of knocking on the head, which may be seen in the Shropshire Board Survey, and elsewhere, appears to me superficial, and totally inconclusive. Du Gard's theory, that there *may* be acute pain without exertion, and that an animal endures pain, whilst the body is quiescent, even if correct, is a poor foundation to build upon, and perhaps his paper might very well serve either side of the question. The acute sense of pain is greatly diminished by opiates, perhaps totally extinguished by that insensibility induced by an impediment put to the vital functions. Indeed pain must inevitably be a different thing, whilst an animal enjoys the full powers of sensation, and under the suspension of those powers; nor ought we, as the case stands, to think much of the degree of pain inflicted, in the very short interval, between the fall of the ox properly pithed, and cutting his throat, *allowed* to be decisive: nor to set a hypothetical and supposititious pain, against the actual and dreadful one of a blow, or perhaps twenty, on the skull, expected and received under the accumulated agonies of horror and affright, which last consideration, however, I am sorry to know, is a source of pleasure to many human beings! The grand point of humanity, is to give the blow unsuspected, to which even a considerable degree of after pain is a feather in the balance.

Mr. Home's paper (p. 250 u. s.) also looks both ways. In the commencement, it shews, that the mode adopted in this country, of killing animals by wounding the spinal marrow, is less humane, than the

more common one of knocking them down. Whilst the conclusion proves by the most irresistible evidence, with which any fact ever was proved, that when the operation is properly performed, its success is complete. And where lies the difficulty of *properly* performing this operation, with such a never-failing facility and success, performed by (p. 244 u. s.) Mr. Smith and his apprentice at Wisbich; at Barton, and generally on the banks of the Humber; in Jamaica, and all over Europe? I am too impatient, perhaps, but I am heart-sick of the refinements and arguments on this subject, of which indeed, I have certain suspicions. With respect to the horrid tortures *professionally* inflicted on brute animals, the justice of the pleas for which, I can never acknowledge, the very name of a once-noted dissector of living bodies, makes me shudder, and fills my mind with disgust and imprecation. The cold-hearted and arrogant replies to the complaints of justice and sensibility, were in the highest degree disgusting and detestable.

Most astonishing it is to me, to find the Rev. and respectable author of the Survey, p. 246, correcting "well-meant reformers," for their error and want of success in this case, when we also find, as has been shewn, that the operation of pithing, properly performed, is completely successful, with the most decisive proofs; proofs in truth, sufficient either to pith or knock on the head, the whole mass of science expended to prove the contrary. The *proper* way it seems is to introduce the instrument upwards into the cavity of the skull, so as to divide the medullary substance. I am however perfectly contented with the common mode of pithing, as infinitely more humane and easy, than the favourite use of the axe. The phrases "difficulty in getting new modes established,"

and “ the time and trouble,” p. 246, are ominous, or rather fully explanatory.

Some person, it seems, has lately been at the expense of taking out a patent for a new mode of slaughtering animals, which if I understand it aright, is the barbarous one of hanging up heavy animals alive by the heels, with pullies and assistants, under the pretence of improving the flesh. Happily the trouble and expense of this mode, will forbid its use.

I wish the above author had described, and by that means more thoroughly reprobated, “ the useless and cruel custom of *setting* the horns of oxen,” of which I and most people, I hope, out of Shropshire, are totally ignorant. The beast, it seems, for that purpose, was driven into a crib, a convenience likewise recommended for *SHOEING* the ox. A model of this kind, in which oxen could be shod standing, was presented to the Board. Such is in use in Leicestershire, (see Pitt’s Survey) and I beg leave to remind all those of its value and consequence, who keep oxen for labour.

Additional testimonies in favour of ox labour, may be found in Young’s Essex, and the question amply discussed in the Rev. Arthur Young’s Sussex. Mr. Newman of Hornchurch, Essex, finds the natural pace of Devon oxen quite as fast, as that of horses. They draw incomparably, and with perfect handiness, at all works. In ploughing they will turn at the land’s end, and re-enter the furrow, as well as the most tractable horses. Uncommonly quiet, and *bear hot weather better than horses*. Works them in collars without goads. Is absolutely decided in the superiority of oxen above horses. If any man would give him twelve such horses as he had before, which cost from thirty to forty pounds each, he would not accept them, to be forced to keep them. Mr. Walters of

Aldborough-hatch, works Devon oxen. They go to London, fourteen miles, and back again, the same day, sometimes unshod, but it hurts their feet. Young's Essex. But to complete the evidence on this subject, let the inquirer consult Young's Survey of Oxfordshire, where, with experiments and practice altogether decisive, will be found the most important rules for feeding the labouring ox; rules which also merit the utmost consideration, when applied to feeding the horse.

Dr. Buchanan says, in India, the Mahometan ladies ride on bullocks. In America, according to Parkinson, oxen are driven upon the trot, for miles together, the drivers riding on an ox, or horse, indifferently. At Mr. Rose's annual ox-race, Lyndhurst, Hants, 1805, one of the oxen, taking fright at the people breaking into the course, bolted and leaped over the rails. A bullock, in that neighbourhood, I believe, had carried the lad with post letters, a stage of ten miles, for years. In Holland, although they possess a breed of such capital cart horses, all their farm labour is done by cows and oxen, and all their labouring animals are treated in an exemplary manner.

“ Working oxen are usually shod at an expense of two shillings each; an operation attended with some nicety. Few smiths, though they can shoe a horse well, are able to shoe an ox. This arises from the thinness of the hoof; in consequence of which, they are apt to drive the nail into the quick; and from the brittleness of it, it will not hold the nails. The operation too, is always performed in a very awkward manner; more so than in most other places. The feet of the oxen being drawn together with strong ropes, they are always cast, or thrown down, which is sometimes attended with accidents, the beast being

irrecoverably lamed, strained, or otherwise injured. The shoes are always made very thin and broad, covering great part of the foot, and rather turning up at the toe between the hoofs: they are fastened on with broad, flat-headed nails, covering with their heads great part of the shoe. Improvement is much wanted in the whole of this operation, by which many of the inconveniences of it might be obviated. But it seems as if none had been hit upon, since the first invention of shoeing, and the first use of oxen as beasts of labour." Tuke's Yorkshire. I have long since, called upon those, who were once so bent upon new discoveries in shoeing the horse, soliciting a part of their attention in favour of the ox, and frequently representing the danger and harshness of casting the ox in order to shoe him.

STALL-FEEDING COWS IN SUMMER. In vol. vi. p. 60, Communications to the Board of Agriculture, is a very important Memoir on this subject, from Norway, by John Collett, Esq. for the whole of which I refer the reader to that volume. Mr. Collett is extremely judicious and accurate in the treatment of his stock. In early spring, he mixes hay and straw with the first cuttings of green clover, that the sudden change from dry to green meat, may not be injurious. His regulations and directions for the servants, upon a board, put up in a conspicuous place, are curious and useful. Two maids and two men are employed to attend 30 cows, 1 bull, 4 calves, and 5 horses, to stall-feed which, during five months, 15 acres of good clover sufficed, sown the year before on rye. The clover must be given fresh, and by no means left cut throughout the night. Nett produce in butter and cheese, from June to October inclusive, £19. 10s. each cow. Another correspondent (p. 231) doubts the profit of stall-feeding cows the year through, I

have before remarked, that, according to my observation, cows always give the greater quantity of milk, in the summer season, when grazing at large.

The following curious and valuable tables of experiments, made at the Earl of Chesterfield's dairy, I obtained through the favour of Lord Somerville.

Experiments made at the Earl of CHESTERFIELD'S Dairy, Bradby Hall Farm, in the Months of May and June, Years 1807 and 1808.

TABLE I.

Showing the Produce of three Milkings from one Cow of each of the stated Breeds and Crosses.

Breeds and Crosses,	Cows.	Produce of three Milkings.					Produce of three Milkings.			
		Milk.		Cream.		Butter.	Milk.		Pressed Cheese Card.	
	Names.	qts.	pts.	qts.	pts.		qts.	pts.	lbs.	ozs.
Holderness - -	Poll - - -	29	—	2	0 $\frac{1}{2}$	38 $\frac{1}{2}$	29	—	8	5
Long Horn - -	Louk - - -	19	0 $\frac{1}{2}$	2	—	26	19	0 $\frac{1}{2}$	7	3 $\frac{1}{2}$
Devonshire - -	Marquiss	16	1	1	1	28	16	1	5	9 $\frac{1}{2}$
Alderney - - -	Lily - - -	19	0 $\frac{1}{2}$	1	1	25	19	0 $\frac{1}{2}$	8	8 $\frac{1}{2}$
Devon and Holderness Cross,	Young Poll	25	—	2	0 $\frac{1}{2}$	32	25	—	8	3 $\frac{1}{4}$
Devon and Long Horn Cross	Beauty - -	28	—	2	1	29	28	—	9	—
Devon and Alderney Cross	Tidy - - -	12	—	1	0 $\frac{1}{2}$	21 $\frac{1}{2}$	12	—	5	—

TABLE II.

Showing the Produce of Five Quarts of Milk, taken from the Milkings of five different Cows of each of the stated Breeds and Crosses.

Breeds and Crosses.	Milk	Butter.		Milk	Pressed Cheese Curd.	
	qts.	ozs.		qts.	lbs.	ozs.
Holderness - - - - -	5	7	—	5	2	4
Long Horn - - - - -	5	6 $\frac{1}{4}$	—	5	2	6
Devonshire - - - - -	5	8 $\frac{1}{4}$	—	5	2	9 $\frac{1}{2}$
Alderney - - - - -	5	9 $\frac{1}{2}$	—	5	2	4
Devon and Holderness Cross	5	8 $\frac{3}{4}$	—	5	2	10
Devon and Long Horn Cross	5	8	—	5	2	9 $\frac{1}{2}$
Devon and Alderney Cross	5	9	—	5	2	4

The Breeds and Crosses placed in Rotation, according to the Quantity of Food they eat.

- 1st. Holderness.
- 2d. Devon and Holderness Cross.
- 3d. Long Horn.
- 4th. Devon and Long Horn Cross.
- 5th. Devonshire.
- 6th. Devon and Alderney Cross.
- 7th. Alderney.

Remarks on the Cross Breeds.

The Devon and Holderness crossed, produce a valuable stock, (very much resembling the Herefordshire cattle) of a large size, hardy, kind feeders, and the meat of an excellent quality.

The Devon and long horn cross are not so large as the former, but very hardy, are kind feeders, and the meat of a good quality.

The Devon and Alderney crossed, produce a very valuable stock, they are of a moderate size, much improved in symmetry, hardy, have a great propensity

to fatten at an early age, even upon indifferent food, and the meat very rich.

The land on which the above experiments were made is of middling quality, a mixed soil, and well watered.

Lord Somerville remarks on the above experiments —“ By this it appears, that the Devon and Alderney cross maintains the high reputation for butter and good feeding which it has long had. The Devon breed itself stands next in rank.”

Mr. Curwen's Hints on the Economy of feeding stock, is the great text book of the present day, for experiments on the large scale, relative to feeding with different articles, for ascertaining the precise value of each as substitutes, and for the quantities required and consumed: for the culture of the green and root crops upon the most scientific principles, and a liberal and enlightened speculation, on some of the most important topics of rural economy.

ROOT CROPS. “ Turnip is the usual food: and it is well worth noticing, as late experiments tend to confirm the remark, that to fat sheep on this food, after summer pasturing them, they will fall off very considerably in flesh: so far from having gained any flesh, they decrease, so that there is little profit by keeping sheep through the winter.” Young's Sussex.

“ Mr. Wakefield of Burnham has no cabbages. Why not Mr. Wakefield? They are a certain expence and very little profit. *He could not better have described the culture of turnips.* Spread a good dressing of manure, fallow well, and sow and hoe turnips; reckon all expences, and strike a balance: then count the profit.” Young's Essex.

I bring the above two respectable quotations, in aid of remarks I have often had occasion to make on

turnip husbandry, to which, however valuable, when fairly appreciated, a strong and mischievous prejudice is attached, more particularly, in the North. A certain man journeyed, I know not how many hundred miles from Scotland, into the South, in order to hire a farm, but turned his back upon it, because the land was too good to grow turnips! All excellence in husbandry seems resolved into the culture of turnips, and it is a common thing, even for a farmer to acknowledge their defects, but at the same time, to demand—how can you clean your land without turnips? I remember, an old woman in Suffolk, argued with the late Captain Bagot, on the utter impossibility of fighting without drums. Now I apprehend, one great reason of the general foulness of land, to be this very precarious dependence for cleaning. Men trust to hoeing turnips solely, instead of hoeing all their crops, an indispensable duty of correct husbandry. But if they drill their turnips, the general husbandry is deemed perfect. On the contrary, without giving up my partiality even for drilling roots, I would surely far more willingly omit it with those, than with white corn, which can by no other mean, be perfectly freed from weeds: but roots may be hand-hoed at least, perfectly, although broad cast. If I was not misled by a cursory examination of the table of comparative Northumberland culture of Turnips, drilled and broad cast, in Mr. Curwen's book, the broad cast equalled the drilled in quantity.

The common turnip, excepting upon certain peculiarly adapted soils, is a poor and washy food, and the plant one of the most tender and most subject to blight, which we know. In an unfavourable season like the last, it is mortifying to see, what a breadth of land must be occupied, to produce a few loads of turnips. And land is always, without a doubt, un-

profitably occupied by turnips, which would produce a more substantial crop, any such crop being equally well calculated to clean the land, as turnips. But custom is all in all, on which account, I suppose, I must not commend the farmers of the Suffolk sand-lands, for cultivating carrets in preference to turnips. To keep fat stock to any advantage with turnips, upon poor soils, it is necessary to allow hay and corn.

The RUTABAGA, or Swedish turnip, is far superior to ours, for the nutritive quality; the yellow species should be preferred, and so far as I have seen, that colour is a general character of superiority in roots. The grand defect in the culture of roots, potatoes more especially, is the planting inferior varieties of seed, by which rubbish is propagated *ad infinitum*. Not indeed a strange, but a common piece of indolence, although it costs little more, to grow good potatoes than bad ones. I am perfectly aware of the occasional unfavourable effects of soil upon the seed, and desire to be understood no farther than that upon the average, good seed will return its like.

STACKING TURNIPS. I have already, in various places, spoken of this very profitable practice, and of the greater worth of the dried turnips, the watery juice being exhaled. This is confirmed in Young's *Sussex*, pp. 239 and 314, where is also a very important comparative estimate between turnips and potatoes, 63 per cent. in favour of the latter. "If 750 sheep require 80 acres of turnips, 2240, the upland stock at General Murray's, require 248 acres of turnips; but (with 20 acres potatoes, &c.) they have only 50." p. 315. In the *Board Communications*, p. 138, is another testimony in favour of stacked rutabaga, and of its being far better relished by the cattle, than the root fresh drawn. This root becomes

soft and mellow by keeping, and may be preserved sound until June or even longer.

CARROTS. A retired schoolmaster from Edinburgh, has lately undertaken this culture, and invented a drill for carrot seed. He finds that a bullock of 50 stone will eat 90lbs. of carrots, before satiety; that after satiety, and on return of appetite, carrot is still the favourite food. That such a bullock will feed fat, upon a regular daily allowance of 27lb. of carrots. That an acre of carrots will weigh 9000lb. a poor crop by the bye. Has taken on lease, land at £7.10s. per acre, for the purpose of cultivating this crop. Board Com.

The above intelligence made me smile. I will tell the reader why. Should the carrot culture become fashionable in Scotland, we shall doubtless take the *ton* from thence, and our newspapers will be filled with advertisements, as in other cases, of instructors and instructions from the North, for the culture of carrots. Nobody will then, be so unfashionable as to know, that Arthur Young promulgated the carrot culture: just as we write and talk of the Northumberland method of drilling turnips, namely, a method practised in the South, more than half a century before it was heard of in Northumberland. Let no man however, draw invidious conclusions from these remarks. I entertain a very high respect for our brethren of Scotland, and agree fully with one who said, "*there is more mind in the North.*" But once more and always, *suum cuique*. I am glad to find, the CABBAGE culture gains ground in Essex.

Northern Short Horns. On recollection, I find I have written incorrectly, p. 57, with respect to those varieties. The Teeswater and Durham are doubtless settled and permanent breeds, equally marked and

distinguishable as the Holderness, and calculated for the production of flesh, as the latter are for that of milk. Doubtless the fault I found with the form of the Holderness oxen, ought, in great measure, to be attributed to the milkiness of the breed, or the Alderney cross. In selected Durham oxen, I have seen a union of the finest form with the largest size. Whence that fineness of bone was obtained, unless from Holderness crosses, I am uninformed. These short-horned cattle are in a state of the highest improvement, from the exertions of various eminent breeders in the North, and I have been informed that a bull was last year (1808) sold in Yorkshire, at the price of five hundred guineas.

CATTLE MEDICINE. Hoven cattle perforated with the trochar and canula, in use for the dropsy, introduced by Mr. Mason, near Warwick. Gunpowder in gin, or milk, successfully given in the case, also æther. One ounce of gunpowder to a pint of milk. An egg-shell full of tar is an old remedy.

In cases of violent inflammation and swelling of the udders of cows, I should expect much benefit from immersing frequently, the udder, in a tub of very warm water, medicated or otherwise, the parts being afterwards anointed. A tub placed upon a stool, might receive the udder, to be soaked for a considerable length of time, at least half an hour.

SCALDS. Apply cold water instantly, and repeat it as often as necessary; puncture the vesicles, and heal with elder or any cooling ointment. Where cold water will not succeed, and that often perhaps depends on constitution, spirits, particularly of turpentine, are proper.

Cow Pox. No attempts seem hitherto to have been made, towards the discovery of remedies in this very troublesome and sometimes loathsome disease.

I have of late known a dairy, in which it has prevailed nearly two years, but must reserve what I may have to say on the subject, for some future occasion. I have never heard of its afflicting dry cows, that probably, drying the cow, bleeding and giving diuretic medicines, keeping her, in the interim, from dangerous exposure to cold, might succeed.

STAGGERS FROM WATERY-HEAD. Considering the tender scull and open sutures of the lamb, I think that exposure to cold and wet, is the usual cause of this disease, or *hydrocephalus*. By way of analogy, there is in the Medical Journal (p. 43, vol. xiv.) a case of an infant exposed to the sudden impression of cold. A considerable discharge from the nose was induced, which continued nearly three months, then suddenly disappeared, and in about a week, symptoms of *hydrocephalus* ensued, with enlargement of the head. The mucuous discharge never afterwards appeared, notwithstanding the exhibition of the most powerful errhines, which did not produce the slightest act of sneezing. The Ettrick shepherd relates some cures by puncturing the bladders, through the nostrils with a wire, but the operation, is generally fatal.

ROT. Fumigations said on the Continent, to have been beneficial and even curative in this disease. For the OXY-MURIATIC FUMIGATION, see p. 511. Portable fumigation bottles are sold at 178, Strand, London.

PULSE of cows in a healthy state, 48 strokes in a minute. Pierson, Croonian Lectures 1805. Perhaps it may be stated considerably higher.

The GUT-TYE fortunately, of rare occurrence, whether in human creatures or brutes. The name is sufficiently expressive, and the disease fatally distinct from common costiveness. Symptoms, falling away in the beast and costiveness which yields to no remedy. A late compilation represents this disease 'as chiefly

confined to the Wealde of Kent, and the neighbouring parts of Sussex!' The only safe and proper operation in the case, is that of the butcher's knife. A worthy gentleman and cultivator within my knowledge, has lately departed, after long and most excruciating sufferings, under the analogous disease.

Eye Water. In the first edition, this was inadvertently ordered far too strong. It is rectified in the present, p. 513, and may be farther reduced by water should that be needful, or strained, after sufficient standing, since the particles of lead are always apt to irritate the eye. The same quantities of vinegar and water, with the addition of a table spoonful or two of brandy, or camphorated spirit instead of the Goulard, make a good eye water.

BLOODY URINE. Captain Raymond informed me, he had a cow under this disorder. The leech gave her myrrh, turpentine, with I know not what other articles of that class, which induced a dreadful and dangerous constipation of the intestines. Back-racking however relieved the cow, and the first malady was cured. See page 499.

MANUAL ASSISTANCE TO THE COW IN BRINGING FORTH. For directions thereon, I must refer to the end of vol. ii. of my Treatise on Horses.

PRECAUTIONS. Against PAINT. Cattle killed in Sussex and Kent 1806, by licking white paint from the fresh painted gates.

YEW trees should be destroyed where cattle are kept—a year scarcely passes, but some cattle are killed by eating yew, and there can be no remedy.

To preserve LAMBS from the Fox. Take equal parts of black sulphur, sulphur-vivum and train oil, mix them with a broad stick and touch with this mixture, the gates of the field, where the lambs are kept. Set up a few posts also, smeared with the mixture, in

various parts of the hedge, or burn straw with the composition over night. Why not smear the backs of the lambs? But perhaps Reynard must not have too near a temptation: would not this method succeed in warning hares and rabbits from Swedish turnip? But being no receipt-monger, the reader will not accurse me of warranting the above, infallible or otherwise.

MERCURIAL OINTMENT. A Rutlandshire farmer lost 99 lambs, through injudiciously dressing his ewes with scab-ointment. Newspapers. The quantity used probably too large, and the sheep exposed to cold.

SMOTHERED. In Suffolk, a flock being driven over a narrow and deep ditch, the leading sheep fell in, and the remainder passing over them, smothered to death 25 sheep and 40 lambs, to the value of between 70 and £80. Same authority.

WARRANTY. Salisbury Assizes, July 1806. H. v. G. 84 ewes were sold warranted sound. Proved by the Plaintiff, that Defendant had water meadow, which was accustomed to rot sheep, and that his own grounds were sound. Plaintiff recovered £57. 11s. 8d. loss sustained by the sheep.

SPRING FROST. Lambs died four or five in a day, ewes had no milk. Broke the ice upon a pond, and the ewes ran in, up to the belly to drink. No more lambs died. Lisle.

THE END.

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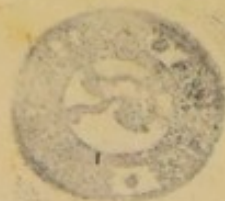
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