

A treatise on the choice, buying, and general management of live stock; comprising delineations and description of the principal breeds... / together with an Appendix on the improvement of British wool and on the destruction of vermin infesting farm-yards,&c.;&c.;

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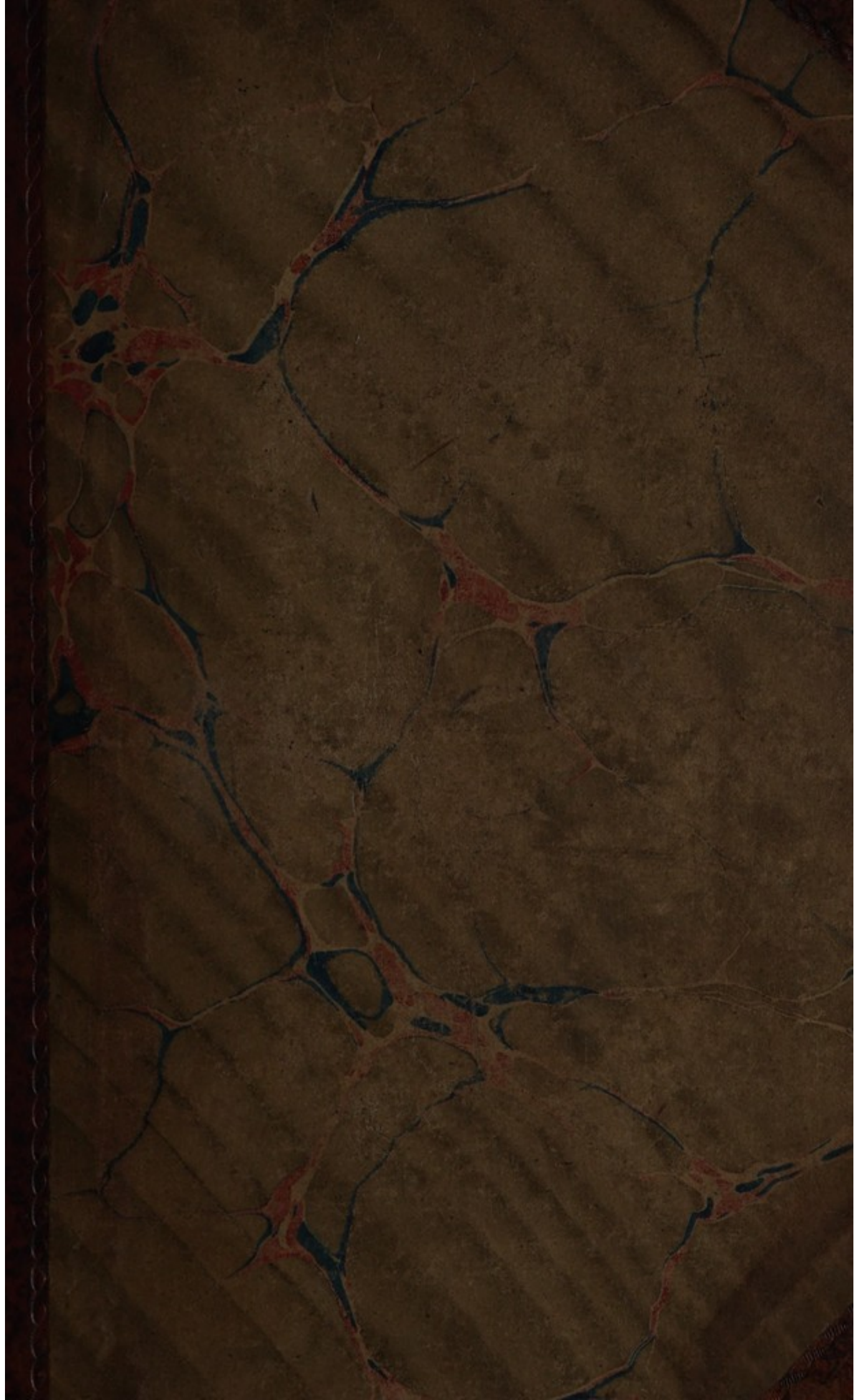
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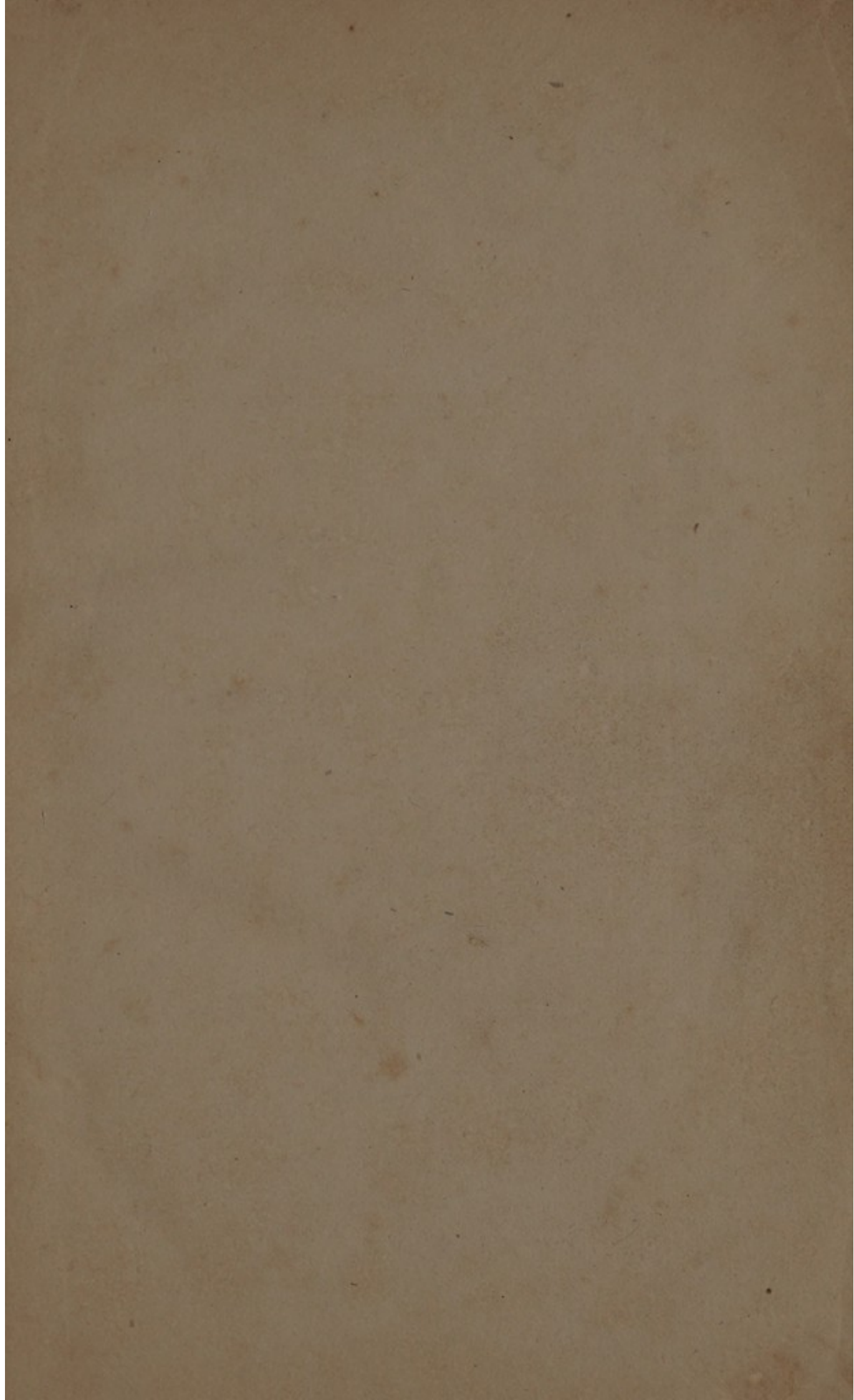
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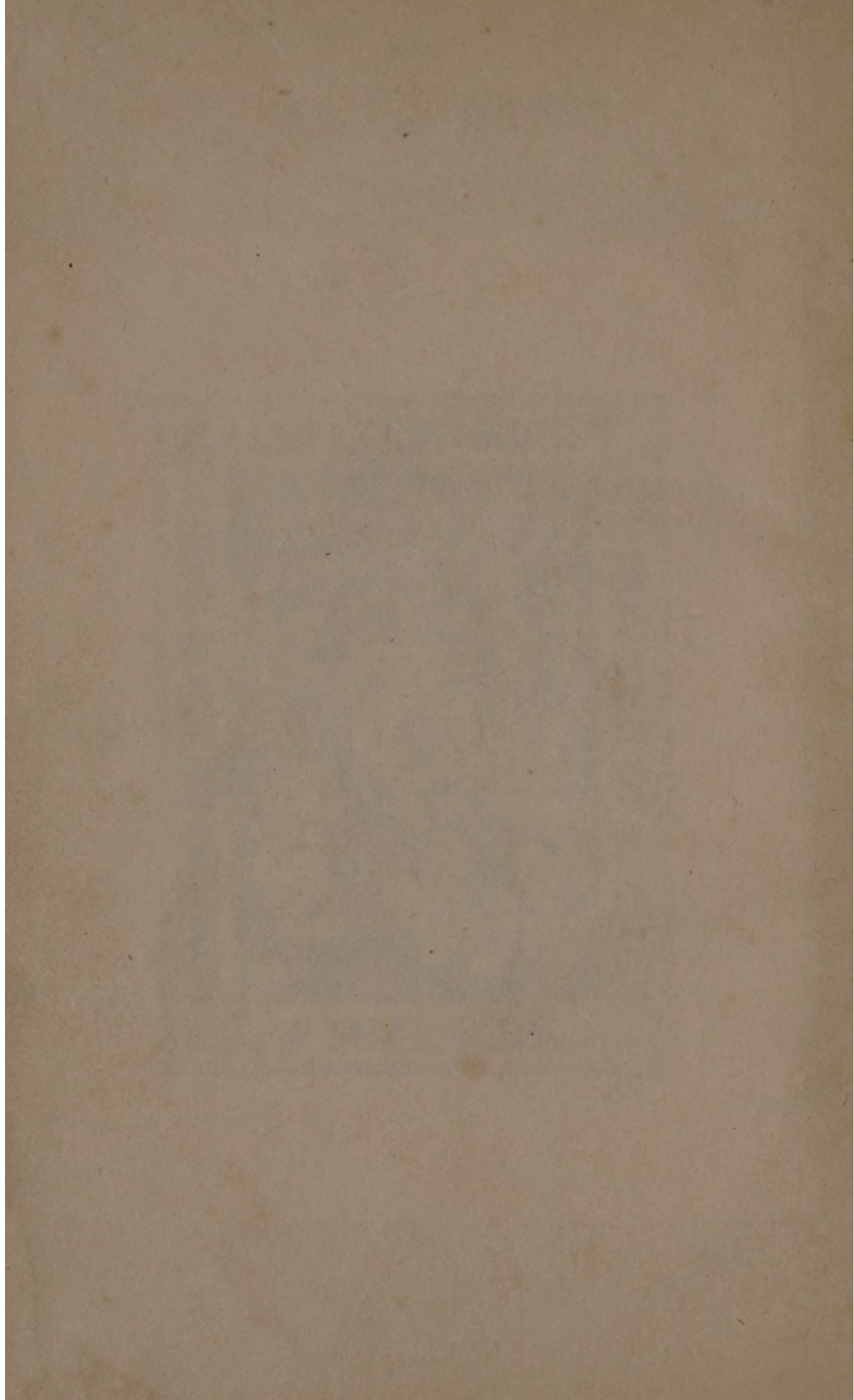


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By William YOUATT







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Boston
Mass
1840

Woodcuts by the Bawicks

See p.p.

24.

25.

26.

27.

28.

29.

75.

79.

85.

86.

119.

120.

122.

136.

139.

154.

155.

A

TREATISE

ON THE

CHOICE, BUYING, AND GENERAL MANAGEMENT

OF

LIVE STOCK;

COMPRISING

DELINEATIONS AND DESCRIPTIONS

OF THE

PRINCIPAL BREEDS

OF

BLACK CATTLE,
SHEEP,
SWINE,
HORSES,
SHEPHERDS' DOGS,



ASSES,
MULES,
POULTRY,
RABBITS, AND
BEES.

TOGETHER WITH AN

APPENDIX,

ON THE IMPROVEMENT OF BRITISH WOOL,

AND

ON THE DESTRUCTION OF VERMIN INFESTING FARM-YARDS, &c. &c.

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1810.

APPENDIX

OF THE

TRADE MARKS

REGISTERED IN THE

OFFICE OF THE

TRADE MARKS

INDEX

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LONDON

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ADVERTISEMENT

TO THE

SECOND EDITION.

THE Author of the *COMPLETE GRAZIER* having been requested, from various respectable quarters, to select and arrange, in a cheap, popular, and convenient form for reference, such parts of that work as more immediately relate to the choice, buying, and general management of Live Stock,—he has complied with a request so flattering to the utility of his Labours. In the present Treatise, therefore, he has endeavoured to exhibit the characteristic properties, advantages, and disadvantages of the various breeds of Cattle reared in the British Isles, illustrated by accurate engravings from living animals; and has also incorporated numerous additional facts, together with much interesting information on the subject of Horses—Shepherds' Dogs—Asses—Mules—Rabbits—Bees—the Improvement of British Wools—Destruction of Vermin infesting Farms, &c.; which he trusts will supply to Farmers and Breeders an useful companion at Markets, Fairs, &c.

In preparing this new edition, the author has carefully revised, corrected, and enlarged the whole; which, he trusts, will prove not unworthy of that patronage with which his labours have hitherto been honoured.

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TABLE OF CONTENTS.

	<i>Page.</i>
ADVERTISEMENT	iii
INTRODUCTION	9
<i>Practical Observations on the purchasing of Live Stock</i>	ibid.
External Form of Cattle	11
Internal Form of Cattle	16
Improvement of Cattle	19, 20
CHAP. I. <i>Of BLACK or NEAT CATTLE</i>	21
Wild Cattle	23
Devonshire Breed	24
Hereford and Sussex Breeds	25
Dutch Breed	26
Lancashire Breed	27
Galloway, or Polled	28
Highland Breed	29
Alderney, or French Breed	29, 30
Lowland Breed	30
Welch Breed	ibid.
Irish Breed	31
Cows	35
Calves	43
Oxen	58
Comparative View of the Advantages and Disadvantages of Horses and Oxen	64—72
Observations on the Teeth of Black Cattle	72, 73
CHAP. II. <i>SHEEP</i>	74
<i>Class I. Sheep without Horns</i>	75
Dishley, or New Leicester	ibid.
Lincolnshire	76
Teeswater	ibid.
Cotswold	77

	<i>Page.</i>
Dartmoor or Devonshire Natts.....	78
South-Down.....	79
Cannock-Heath Breed.....	80
Herdwick Breed.....	81
Cheviot Sheep.....	ibid.
Dun-faced Breed.....	82
Shetland Breed.....	ibid.
<i>Class II. Horned Sheep</i>	83
Shropshire Breed.....	ibid.
Exmoor Breed.....	ibid.
Dorsetshire Breed.....	83, 84
Norfolk Breed.....	84
Heath, Linton, Short, or Forest Sheep.....	85
Merino or Spanish Sheep.....	86—89
<i>Choice of Sheep for Live Stock</i>	89—92
Management of Ewes.....	92—96
Sheep-husbandry.....	97—114
House-Lambs.....	114—117
CHAP. III. SWINE.....	118
Marks of a good Hog.....	ibid.
Berkshire Breed.....	119
Chinese.....	120
Gloucester.....	ibid.
Hampshire.....	121
Highland Breed.....	ibid.
Northampton.....	ibid.
Shropshire.....	ibid.
Rudgwick Breed.....	ibid.
Swing-tailed Breed.....	122
Large Spotted Woburn.....	ibid.
General Management of Swine.....	123—126
Weight of Cattle.....	126—133
Tables of Weights of Cattle.....	133, 134
CHAP. IV. HORSES.....	135
Clydesdale Horses.....	ibid.
Cleveland Bays.....	ibid.
Suffolk Punches.....	136
Old English Draught Horse.....	137

	<i>Page.</i>
General Management of Horses	138—144
<i>Age of Horses</i> (WITH A PLATE)	144—149
CHAP. V. ASSES	150—151
MULES	152, 153
CHAP. VI. DOGS	154
Shepherd's Dog	ibid.
Cur Dog	155
Observations on the Keeping of Dogs	156, 157
CHAP. VII. POULTRY—RABBITS	158—171
<i>Land-Fowl in general</i>	158—166
<i>Water-Fowl</i>	167—169
<i>Rabbits</i>	169—171
CHAP. VIII. BEES	172—175

APPENDIX.

I. ON BRITISH WOOL, <i>including Hints for the Improvement</i> <i>of its Quality and Quantity</i>	177—179
II. DESTRUCTION OF VERMIN	197—212
1. Ant-Hills	198
2. Mole-Hills	199
3. Rats and Mice	200—203
4. Weasels	203
5. Caterpillars	203—207
6. Snails	208
7. Slugs	ibid.
8. The Fly or Black Fly	ibid.
9. Pole-Cats	209
10. Badgers	210
11. Foxes	ibid.
12. Kites	212
III. ON THE CHANGES OF WEATHER, <i>as indicated</i> <i>by various Phenomena</i>	213
1. By Animals	ibid.
2. From the Appearance of the Earth	215
3. From the Atmosphere	216
4. From the Seasons	217
Index	221

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A

TREATISE

ON

LIVE STOCK.

INTRODUCTION.

PRACTICAL OBSERVATIONS ON THE PURCHASING OF
LIVE STOCK.

VARIOUS circumstances have of late years combined to render Live Stock an object of the utmost importance to the farmer; and, notwithstanding the very great advances made in other branches of Agriculture, none, perhaps, has undergone a greater change, or has received greater improvement than that department, which has for its object, the *purchasing, breeding, and rearing* of LIVE STOCK. The attention of the reader will therefore be directed, in the first place, to some general observations on the buying of and the stocking a farm with cattle; after which the various kinds of live stock will be discussed, and their relative value and importance pointed out.

Where any considerable improvement is intended to be made or attempted, in the live stock of a farm; or where a person is just entering upon the agricultural profession; the first object of consideration must be, the *proportion between his stock, and the quantity of feed* which will be necessary to support them. He should also take care that

there be a sufficient degree of shade, warmth, and shelter; and should further consider the nature, situation, and fertility of the soils that compose his farm, and especially whether they be in a suitable state of drainage, should any of the soils be of a nature to require draining. Equally worthy of notice is the purpose, for which he particularly designs to keep live stock, whether for the pail or dairy, or with a view of supplying the markets. Indeed it is indispensably necessary to observe the greatest possible exactness in this proportion; because, in the event of his land being over-stocked, his loss will be certain and great; while, on the other hand, he will be liable to a loss of profit, in case his farm is not stocked with as many cattle as it will bear.

Formerly, a great prejudice prevailed in favour of big-boned large beasts, but it has been ascertained, that this breed is, in point of profit, much inferior to the middle-sized kind; and, by a careful attention to the selection of stock, no inconsiderable progress may be made towards the improvement of the different species. Among the various professional breeders of modern times, few have attained greater celebrity than the late Mr. Bakewell, of Dishley, to whom we are indebted for many new and important improvements in the science of rearing cattle. The principle which he invariably adopted was, to select the best beast, that would weigh most in the valuable joints; so that, while he gained in point of shape, he also acquired a more hardy breed; and, especially by attending to the *kindliness* of their skin, he became possessed of a race which was more easily fed and fattened than any other.

Till within a few years, the invariable practice was to judge by the *eye* only, without regarding the other qualities of the animal intended to be purchased; but, in the present improved age, a more rational mode of forming the

judgment is adopted. The sense of touch is now brought in aid of the sight; and by repeated practice, the art of judging of the kindliness to fatten has been brought to such perfection, that any well-informed breeder, who has *personal* experience, can, on examining lean beasts, tell, almost instantaneously, in what points or parts they will or will not fatten.

In the selection, therefore, of live stock in general, the young farmer will find it necessary attentively to consider the following particulars :

I. EXTERNAL FORM.

1. BEAUTY OR SYMMETRY OF SHAPE; in which the form is so compact, that every part of the animal bears an exact consistency, while the carcass should be deep and broad, and the less valuable parts, such as the head, bones, &c. ought to be as small as possible*. For working cattle more particularly, Mr. Marshall states the following proportions as being essentially necessary, viz. That the neck be thin and clean, to lighten the fore-end as well as to lessen the collar, and make it sit close and easy on the animal while employed in draught. The carcass should be large, the bosom broad, and chest deep: the ribs standing out from the spine, both to give strength of frame and constitution, and likewise to admit of the intestines being lodged within the ribs. Further, the shoulders ought not only to be light of bone and rounded off at the lower point, that the collar may sit easy, but also broad, to impart strength; and well covered with flesh, that the animal may draw with greater ease, as well as to furnish a desired point of fattening cattle. The back

* Sir John Sinclair's "Hints regarding Cattle," in the *Farmer's Magazine*, p. 154.

also ought to be wide and level throughout; the quarters long, the thighs thin, and narrow at the round bone. The legs ought, below the knee and hock, to be straight, and of a moderate length; light-boned; clean from fleshiness, yet having joints and sinews of a moderate size, for the united purposes of strength and activity. In these points all intelligent breeders concur; but, as beauty of shape too often depends on the caprice of fashion, it is more requisite to regard,

2. UTILITY OF FORM, or that nice proportion of the parts to which Mr. Bakewell bestowed so much attention, and which has already been noticed.

3. The FLESH, or texture of the muscular parts; a quality which was formerly noticed only by butchers, but the knowledge of which the enlightened farmers or breeders of the present day, have not blushed to acquire from them; although this quality necessarily varies according to the age and size of cattle, yet it may be greatly regulated by attention to the food employed for fattening them. As a knowledge of this requisite can only be acquired by practice, it is sufficient to state, that the best sign of good flesh is that of being *marbled*, or having the fat and lean finely veined, or intermixed when the animals are killed; and, while alive, by a firm and mellow feel.

4. In rearing live stock of any description, it should be an invariable rule to breed from small-boned, straight-backed, healthy, clean, kindly-skinned,* round-bodied,

* This term implies a skin which feels *mellow*, i. e. soft, yet firm to the touch, and which is equally distant from the hard dry skin, peculiar to some cattle, as it is from the loose and flabby feel of others.

and barrel-shaped animals, with clean necks and throats, and little or no dewlap; carefully rejecting all those which may have heavy legs and roach backs, together with much appearance of offal. And, as some breeds have a tendency to generate great quantities of fat on certain parts of the body, while in others it is more mixed with the flesh of every part of the animal, this circumstance will claim the attention of the breeder as he advances in business.

5. In the purchasing of cattle, whether in a lean or fat state, the farmer should on no account buy beasts out of richer or better grounds than those into which he intends to turn them; for in this case, he must inevitably sustain a very material loss, by the cattle not thriving, particularly if they be old. It will, therefore, be advisable to procure them, either from stock feeding in the neighbourhood, or from such breeds as are best adapted to the nature and situation of the soil.
6. **DOCILITY OF DISPOSITION**, without being deficient in spirit, is of equal moment; for, independently of the damage committed by cattle of wild tempers on fences, fields, &c. which inconvenience will thus be obviated, it is an indisputable fact, that *tame beasts require less food to rear, support, and fatten them*; consequently every attention ought to be paid, early to accustom them to be docile and familiar.
7. **HARDINESS OF CONSTITUTION**, particularly in bleak and exposed districts, is indeed a most important requisite; and, in every case, it is highly essential to a farmer's interest to have a breed that is liable neither to disease nor to any hereditary distemper. A dark colour, and in cattle which are kept out all the winter, a rough and curled *pile* or coat of hair are, in the popular

estimation, certain indications of hardiness; but it is obvious to every thinking person, that this quality, though in some respects inherent in particular breeds, depends, in a great measure, upon the method in which cattle are treated.

8. Connected with hardiness of constitution is EARLY MATURITY, which, however, can only be attained by feeding cattle in such a manner as to keep them constantly in a growing state. By an observance of this principle, it has been found, that beasts and sheep, thus managed, *thrive more in three years*, than they usually do in *five*, when they have not sufficient food during the winter, by which, in the common mode of rearing, their growth is checked.

9. A KINDLY DISPOSITION to take fat on the most valuable parts of the carcass, at an early age, and with little food, when compared with the quantity and quality consumed in less fertile situations, by which means the supply will be greater for the consumer. On this account, smaller cattle are recommended by C. G. Grey, Esq. ("Letters and Papers of the Bath and West of England Society," vol. x. p. 262), as generally having a more natural disposition to fatten, and as requiring, proportionably to the larger animal, less food to make them fat; consequently, the greater quantity of meat for consumption can be made per acre. "In stall-feeding," the nature, method, and advantages of which will be stated in a subsequent chapter,* he remarks that, "whatever may be the food, the smaller animal pays most for that food. In dry lands the smaller animal is always sufficiently heavy for treading; in wet lands less injurious." And as to milk, he is

* Chap. III. Sect. 2.

decisively of opinion, that the smaller animal produces more goods for the food she consumes than those of a larger size.

10. THE HIDE of cattle is also worthy of notice; as, by the simple touch, both butchers and graziers are enabled to judge of their disposition to fatten. Sir John Sinclair has justly remarked,* that, "when the hide or skin feels soft and silky, it strongly indicates a tendency in the animal to take on meat; and it is evident, that a fine and soft skin must be more pliable, and more easily stretched out to receive any extraordinary quantity of flesh than a thick or tough one. At the same time, thick hides are of great importance in various manufactures. Indeed, they are necessary in cold countries, where cattle are much exposed to the inclemency of the seasons; and, in the best breeds of Highland cattle, the skin is thick, in proportion to their size, without being so tough as to be prejudicial to their capacity of fattening."

11. WORKING, or an aptitude for labour; a point of infinite importance in a country, whose population is so extensive as that of Britain, and where the consumption of grain by horses has so material an influence on the comforts and existence of the inhabitants. As, however, there is a difference of opinion on this subject, the reader is referred to the fifth section of this chapter, where the question is fully discussed.

12. Whether kine be purchased for the plough, or for the purpose of fattening, in addition to the essentials

* "Hints regarding Cattle," p. 157, &c.

already stated, it will be necessary to see that they are young, in perfect health, full-mouthed, and not broken either in tail, hair, or pizzle; that the hair *stare* not, and that they are not hide-bound, otherwise they will not feed kindly. The same remark is applicable to cows intended for the pail, the horns of which should be fair and smooth, the forehead broad and smooth, udders white, yet not fleshy, but thin and loose when empty, to hold the greater quantity of milk, but large when full; provided with large dug-veins to fill it, and with four long, elastic teats, in order that the milk may be more easily drawn off.

13. AGE.—Besides the rules above stated, there are some particulars with regard to the age of neat or black cattle and sheep, as well as of horses, which will be respectively noticed under the several chapters appropriated to those animals.

II. INTERNAL FORM.

IN addition to the preceding hints on the choice of cattle, as derivable from external form, the following Strictures on their internal form, by Henry Cline, esq. are highly deserving the reader's attention.* They were addressed (in 1805) to the Board of Agriculture.

The object of Mr. C.'s paper is to ascertain in what instances the crossing of cattle is *proper*, and in what *prejudicial*; and also the principles upon which the propriety of it depends.

* "Communications to the Board of Agriculture" for 1805.

It has been generally understood that the breed of animals is improved by crossing with the largest males. This opinion, Mr. C. remarks, *has done much mischief*, and would have done more, if it had not been counteracted by the desire of selecting animals of the best forms and proportions, which are rarely to be met with in those of the largest size. The *external form* of domestic animals has been much studied, and the proportions well ascertained: but the external form is an indication only of *internal* structure. The principles of improving it therefore must be founded on the knowledge of the structure and use of the internal parts. Of these,

1. THE LUNGS are of the first importance: it is on *their* size and soundness that the strength and health of an animal principally depend. The power of converting food into nourishment is in proportion to their size. *An animal with large lungs is capable of converting a given quantity of food into more nourishment than one with smaller lungs, and therefore have a greater aptitude to fatten.*

2. CHEST.—The size and form of the chest indicate the size of the lungs, of which the form should approach to the figure of a cone, having the apex situated between the shoulders, and its base towards the loins: a *circular* form of chest is preferable to one deep and narrow; for, though the *latter* may have greater girth, the *former* will have greater internal space in proportion.

3. THE PELVIS.—The pelvis is the cavity formed by the junction of the hip-bones with the rump-bone: this cavity should be *large in a female*, that she may be enabled to bring forth her young with less diffi-

culty. When this cavity is small, the life both of the mother and also of her offspring is endangered.

The size of the pelvis is indicated by the width of the hips, and the space between the thighs: the breadth of the loins is always in proportion to that of the chest and pelvis.

4. HEAD.—The head should be small, by which means the birth is facilitated to the offspring: it also indicates the animal to be of a good breed, and occasions less weight of unprofitable substance to the consumer.

Horns are useless to domestic animals, and occasion a great weight of bone in the head: the skull of a ram with horns weighed five times as much as that of a ram without horns, each being four years old. A mode of breeding, which would prevent the introduction of horns, would therefore afford a considerable saving. The *length of the neck* should be proportioned to the height of the animal, that it may collect its food with ease.

5. MUSCLES.—The muscles and tendons (which are their appendages) should be large; by which an animal is enabled to travel with greater facility.

6. BONES.—The strength of an animal does not depend on the size of the bones, but on that of the muscles; many animals with large bones are weak, their muscles being small.

Animals, imperfectly nourished during growth, have their bones disproportionally large: if this originated

from a constitutional defect, they remain weak during life; large bones may therefore indicate an imperfection in the organs of nutrition.

IMPROVEMENT OF FORM.

THE chief point to be attended to, for the improvement of form, according to Mr. Cline's principles, is the selection of males for breed of a proportionally smaller size than the females, both being of approved forms: the size of the fœtus depends on the size of the male; and therefore, when the female is disproportionately small, her offspring has all the disproportion of a starveling, from want of due nourishment.

Mr. Cline further states, that the larger female has also a greater supply of milk; and that her offspring is therefore more abundantly provided with nourishment after birth. But this proportion can only be understood in a general sense: for small cows (the Norman breed, for instance) are often known to yield more milk than large ones. The quantity of milk indeed seems to depend on the particular breed, and on the adequate supply of food.

When the female is large in proportion to the male, the lungs of the offspring will also be greater; by crossing in this manner, there are produced animals with remarkably large chests, as has often been noticed; the advantage of large lungs has already been pointed out.

In animals, where activity is required, this practice should not be extended so far as in those which are intended for the food of man. The size of animals is commonly adapted to the soil which they inhabit; when the produce is scanty, the breed is small; the large sheep of

Lincolnshire would starve, where the small sheep of Wales find abundant food.

Crossing may be attended with bad effects, even when begun on good principles, if the above rule be not attended to throughout: if large ewes were brought to Wales, and sent to the rams of the country, the offspring would be of improved form; and, if sufficiently fed, of larger size than the native animals: but, the males of this breed would be disproportionately large to the native ewes, and therefore would produce a starveling ill-formed race with them.

The general mistake, in crossing, Mr. Cline thinks, has arisen from an attempt to increase the size of a native race of animals, being a fruitless effort to counteract the laws of nature; which—from theory, from practice, and from extensive observation—Mr. C. concludes to be decidedly wrong; for, in proportion to this unnatural increase of size, they become worse in form, less hardy, and more liable to disease.

CHAP. I.

OF BLACK OR NEAT CATTLE.

AS the male of every species is the principal in the breed and generation, we shall first give an account of that form or shape, as also of those qualities which are essential to the constituting of a perfect animal; and afterwards specify the principal breeds found in this island, together with such practical remarks on neat cattle in general, as may prove beneficial to the young farmer or grazier.

A bull, then, ought to be the most handsome of his kind; he should be tall and well made; his head should be rather long; and, as it is designed by nature to be the chief instrument both of offence and of defence, it ought to present every mark of strength; his horns rather long, clean, and bright; his large black eyes lively and protuberant; his forehead broad and close set with short, curled hair; his ears long and thin, hairy within and without; muzzle fine; nostrils wide and open; neck strong and muscular, not encumbered with a coarse, wreathy skin, but firm, rising with a gentle curve from the shoulders, tapering to the part where it is connected with the head; the dewlap large, thin, and hairy. Further, his shoulders should be deep, high, and moderately broad at the top; the bosom open; breast large, and projecting well before his legs; back straight and broad, even to the setting on of the tail, which should not extend far up the roof, but be strong and deep, with much lank hair on the under part of it; ribs

broad and circular, rising one above another, so that the last rib shall be rather the highest; the fore thighs strong and muscular, tapering gradually to the knees; the belly deep, straight, and also tapering a little to the hind thighs, which should be large and square; the roof wide, particularly over the chine and *hips*, or *hooks*; the legs straight; short jointed, full of sinews, clean, and fine boned; knees round, big, and straight; feet distant one from another, not broad, nor turning in, but easily spreading; hoofs long and hollow; the hide not hard, or stubborn to the touch; the hair uniformly thick, short, curled, and of a soft texture; and the body long, deep, and round, filling well up to the shoulder and into the groin, so as to form what has not improperly been termed a round or *barrel-like* carcass.

The bull attains the age of puberty generally at the end of from twelve months to two years; but it is advisable to restrain him from the propagation of his species until he has arrived at his full growth, which is about four years; for, if this animal be suffered to breed earlier than three years, the stock is liable to degenerate. Nor ought more than twenty cows to be allotted to one bull, or this animal be permitted to serve more than two cows in one day.

The bull, as well as the cow and ox, generally lives about fourteen years; but the progress of decay is usually perceptible after he has attained the age of ten years. His temper is naturally fierce and ungovernable, which is not a little increased by his being permitted to live quietly in the best pastures, without being applied to any useful purpose but that of propagating his species. Hence this animal, naturally vicious, often becomes so mischievous as to endanger many valuable lives; an evil which, we conceive, might be remedied by training him to labour. For, being

the only beast of his size which is thus indulged in idleness, and as he possesses equal strength with the ox, we doubt not but if he were moderately worked, and allowed to indulge his desires during the breeding season, he would, by being inured to labour and attended by mankind, become gradually tame, and harmless as the horse, or any other often naturally vicious animal. We understand, indeed, that several experiments have been made for this purpose; and, from their successful result, we think the practice of working bulls may be advantageously adopted; especially as these animals are not only broken in with little difficulty, and work well, but also because they recover from fatigue much sooner than any ox, and may generally be procured at easy prices in those places where, oxen being scarce, a young farmer cannot purchase without involving himself in great expense.

I.—WILD CATTLE.

THE SPECIFIC CHARACTERS of this breed, which is generally understood to be the original race of this island, are as follow:—Horns white, tipped with black; colour invariably white; ears, internally and externally, from the tip downwards, about one-third red; black muzzles.

PECULIAR ADVANTAGES, OR DISADVANTAGES.—Flesh very fine, and of excellent flavour. This breed is, at present, only to be found in Chillingham Park, in the county of Northumberland.

II.—DEVONSHIRE BREED.



This breed is descended from the wild race.

Its SPECIFIC CHARACTERS are:—The horns are of a middle length, bending upwards; colour light red, with a light dun ring round the eye; thin face; hips wide; and thin skin. This breed of cattle is most admirably calculated for draught: though rather small in point of size, they amply compensate for that defect by their hardiness and agility. They fatten early. The Devonshire breed derives its name from the county where the cattle are chiefly bred. The figure above delineated is from an ox belonging to Lord Somerville, and exhibited at his show of cattle in 1806.

His lordship has remarked, that “graziers prefer the Devon breed 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.

They are mostly yoked at two or three years old, and lightly worked. Their labour is increased at four; and from that period to six, they are full-worked. Worked oxen of this breed attain a larger size than those which are *not* worked: they generally finish their growth at six years old, but the largest size grow the longest.



Of this race there are two varieties:—1. THE HEREFORDSHIRE; and, 2. The SUSSEX. Their colour is red; hair fine; thin skin; horns of a medium length, rather curving upwards; head and neck clean; hips, rump, and sirloin wide; thin thighs; back straight; chine narrow; small boned. The animal above delineated has been drawn from a prize ox of that spirited grazier, Mr. Westcar.

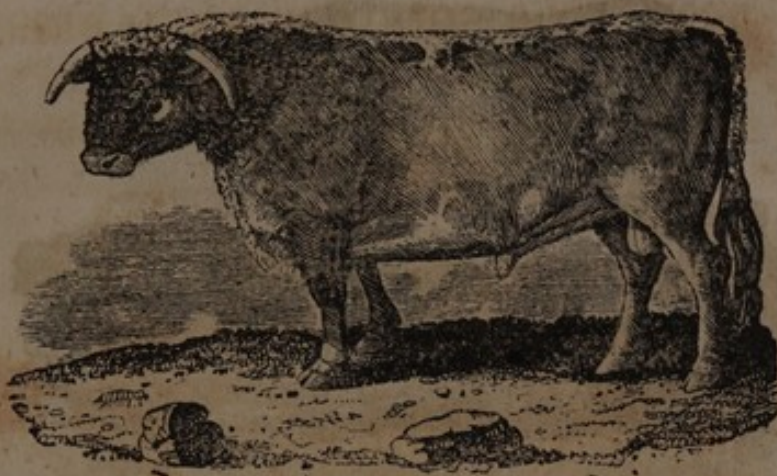
The ADVANTAGES resulting from these two varieties are, in every respect, similar to those of the parent race:—The cows yield a good portion of rich milk. The Sussex and Hereford breeds occur particularly in the two counties whence they are denominated; also in Kent, and various other parts of England.

III.—DUTCH, OR SHORT HORNED BREED.



SPECIFIC CHARACTERS.—The hides are thin; the horns short; they have but little hair; the colour is red and white, nearly equally mixed; tender constitutions. They possess, however, the valuable property of fattening kindly, and yielding great quantities both of milk and tallow. The principal resort of this breed is in the eastern counties of England, as well as in some of those in North Britain, which border on the German Ocean.

IV.—LANCASHIRE BREED.

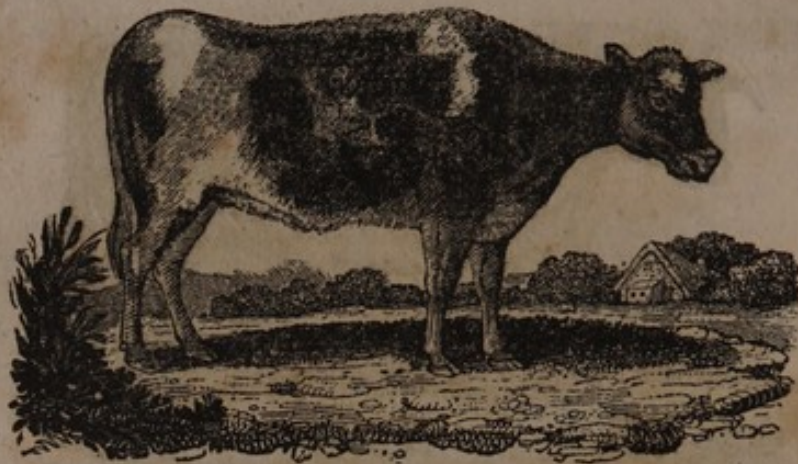


SPECIFIC CHARACTERS.—Long-horned; hides firm and thick; hair long and close; necks thick and coarse; colours various, with a white streak along the back; hoofs large; fore quarters deeply made; the hind quarters lighter than those of other breeds.

ADVANTAGES OR DISADVANTAGES peculiar to this breed.—Constitution hardy. The milk less in point of quantity, but the cream is of a richer quality than that of other species of neat cattle. The long-horned cattle are principally reared in Lancashire, Leicestershire, Warwickshire, and the chief grazing counties.

Of this breed, there is a variety, known by the name of **DISHLEY**, which is descended from that kind selected, improved, and recommended by the late Mr. Bakewell. This variety is in great request in various parts of England: its *specific characters* correspond, in a very great degree, with those of the parent stock; but the leg bones are fine, small, and clean; and the hides are thin. The Dishley neat cattle fatten kindly and in a little time, upon the most valuable points, though yielding but little milk for the dairy, and producing little tallow.

V.—GALLOWAY, OR POLLED.



This breed derives its name from the county of Galloway, where, and also in some parts of the Lowlands of Scotland, they are chiefly reared; and whence vast numbers are annually sent to Norfolk, and other English counties, to be fattened for the markets.

SPECIFIC CHARACTERS.—They have no horns, though a few beasts sometimes have too small excrescences depending from the parts where horns usually grow, in colour and shape resembling the long-horned race, though somewhat shorter; hides moderately thick.

PECULIAR ADVANTAGES.—A most excellent and hardy breed, fattening kindly on the best parts; flesh fine grained and well mixed with fat; when castrated, well calculated for draught.

Of this breed also there is a variety, termed the **SUFFOLK DUNS**: they are polled, or without horns; small sized, very lean, and big-bellied; colour, a light dun. Suffolk and the adjoining counties contain the largest number of this variety, which is excellently calculated for the dairy, and yields abundance of rich milk. The figure above delineated, was drawn from a Galloway heifer exhibited at Lord Somerville's cattle show, in 1806.

VI.—HIGHLAND BREED, OR KYLOES.



SPECIFIC CHARACTERS.—Generally they have horns of a middle size, bending upwards; the colours are various, chiefly black, though sometimes brindled or dun; hair long and close; in other respects not unlike the Galloway breed. In point of advantageous qualities, this breed resembles the preceding species, being eminently calculated for cold, mountainous situations. The Kyloes are reared in the Highlands, or western parts of Scotland; whence great numbers are annually sent to England for sale.

There is a variety of this breed, denominated the **ISLE OF SKY BREED**, from the island where they are principally found: they are of a diminutive size, but in other respects are similar to the Kyloes, both in their specific characters, and also as to their peculiar advantages; they are, however, superior to the Highland race for quick fattening.

VII.—ALDERNEY, OR FRENCH BREED.

SPECIFIC CHARACTERS.—Small sized; colour light, red, or yellow; horns smooth and neat; of tender constitutions.

This breed occurs principally in the south of England, in the possession of gentlemen.

The Alderney cows are very rich milkers; their flesh is high coloured, fine grained, and of excellent flavour.

The DUNLOP BREED is the produce of a cross of Alderney cows with Fifeshire bulls, and is thus denominated from the parish, or district, where it was first reared. The horns of this race are small, and awkwardly set. The animals are small in size, and of a pied, or sandy-red colour; they are, however, admirably well calculated for the dairy, on account of the richness and quantity of milk afforded by the cows; but not for feeding calves, unless for rearing stock.

VIII.—THE LOWLAND BREED

Is a mixed race, between the Kyloes and Galloways, partly long horned and partly polled; black, brindled, or dun coloured. They are but indifferent for the purposes of the dairy, though they partake of the Galloway kindliness to fatten; on which account large numbers are annually sent from the Lowlands of Scotland into England, to be fattened for the markets.

IX.—WELCH BREED.

SPECIFIC CHARACTERS.—Horns thick, curving upwards; size small; colour chiefly black; bones and shape clean and well proportioned. The Welch cattle are remarkably quick feeders, vigorous, and well calculated for labour, especially the Glamorganshire sort: they are greatly improvable by proper selection and judicious crossing. This

race of cattle is bred particularly in the counties of Cardigan and Glamorgan, as well as in other parts of Wales; and especially in the southern English counties, where they are greatly prized.

X.—IRISH BREED.

The breed of Irish cattle, of which many thousand carcasses are annually exported, is distinguished by little variety, excepting that which necessarily arises from the difference of situation. They are remarkable for the strength of their constitution; and appear to be a mixed race, between the long-horned breed and the Scotch or Welch cattle. The counties of Roscommon, Limerick, Cork, and Tipperary are chiefly celebrated for the vast herds of cattle which are there annually bred and slaughtered for exportation; and many of the most public-spirited breeders have, of late years, incurred very considerable expence by purchasing prime long-horned stock from England, for the purpose of improving their breeds; a measure that has already been attended with the most beneficial effects, and which will doubtless, in the course of a few years, prove a source of great wealth to that island,

From this view of the various breeds of cattle, occurring in the British Isles, the reader may be enabled to form some estimate of the value of the respective breeds therein described; the two kinds, however, which are chiefly reared, are the *long-horned* and the *short-horned* cattle; and, concerning their merits and demerits, there has long been a difference of opinion among the most experienced breeders. It may not, therefore, be altogether useless to offer a few comparative remarks to the consideration of the young grazier. “The long-horns,” Mr. Culley has remarked,

“ excel in the thickness and firm texture of the hides, 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 slower feeders, and of a coarser make, 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.”

It should, however, be understood, that the preference above given by Mr. C. to the long-horned species, on account of the superior quality of their beef, applies only to the variety of that breed which was selected, improved, and recommended by the late eminent Mr. Bakewell, and which is described in the view prefixed to this chapter, under the name of the *Dishley breed*. Indeed, the rich quality of the milk, and peculiar barrel-like form of carcass in the long-horned breed, are manifestly indicative of a disposition to fatten kindly. It is the opinion of Mr. Culley, whom long practice and experience have rendered a competent judge in this department of rural economy, that the beef of the short-horned race is, in general, superior to that of the common long-horned sort ; though he has little doubt but “ a breed of short-horned cattle might be selected, *equal*, if not *superior*, even to that very *kindly-fleshed* sort of Mr. Bakewell’s, provided any able breeder, or body of breeders, would pay as much attention to these as Mr. Bakewell and his neighbours have done to the short-horns.”

That consideration which this important subject requires, has of late years been amply bestowed upon the improve-

ment of British cattle; and, beside the respectable breeder above-mentioned, the labours of the late and present Duke of Bedford, the late Mr. Fowler*, of the various excellent societies established in many parts of Britain for this public-spirited purpose,—not to omit the numerous private individuals who have recently applied themselves to this branch of rural science,—all these must claim the gratitude and good wishes of every real friend to his country.

But though the short and long-horned cattle have hitherto almost exclusively occupied the attention of breeders, it is evident, that there are other varieties, or species, which might be introduced with greater advantage in many situations. Such, for instance, are the *Highland* breed, or *Kyloes*, and its variety, the *Isle of Sky* cattle, which are singularly well adapted to cold, exposed, and heathy, mountainous parts; such also are the *Galloway*, and its variety, the *Suffolk Duns*. These beasts have acquired great reputation at Smithfield market for the excellence of their marbled flesh, a quality which is ma-

* Of Little Rollright, in the county of Oxford, whose stock was sold by auction, in the month of March, 1791. Few exhibitions could be more enchanting than the picturesque view presented by these beautiful animals, at the sale of which the most respectable farmers were present, many of whom had travelled several hundred miles, from almost every part of Britain; and the prices given for which are almost incredible. Let it suffice to say, that fifteen prime head of cattle, five bulls and ten cows, were sold for various sums, amounting to £2464; or, upon an average, at £164 each. The finest bull, named *Sultan*, only two years old, produced *two hundred and ten guineas*; *Washington*, another of the same age, was sold for *two hundred and five guineas*; while *Brindled Beauty*, a cow, brought the sum of *two hundred and sixty guineas*; and, at a subsequent sale of Mr. Paget's stock, in November, 1793, *Shakespeare*, a bull, bred by Mr. Fowler, was disposed of for the enormous sum of *four hundred guineas!!!*—So great, indeed, was Mr. F.'s deserved reputation, that the Great Frederick, king of Prussia, conferred on him a gold medal, and honoured him with his correspondence.

terially increased by their quick feeding, and kindness to fatten.

It has already been hinted, when discussing the subject of buying cattle, that it will be advisable to select them, either from stock feeding in the neighbourhood, or from those sorts which are best calculated for the nature and situation of the soil. This remark should be constantly kept in view, with regard to the breeding of cattle; let, therefore, that breed which is most profitable and best suited to the situation of the farm first be ascertained; and, having succeeded in this desirable object, let it be the breeder's study to improve that sort to the utmost, by selecting and breeding from those, which to beauty of form unite the more essential qualities of possessing *kindly* skins, and of weighing most in the valuable parts, together with a disposition to lay fat on the best points, as well as to fatten in a short period of time.

The following practical remarks on this branch of rural economy, (for which we are indebted to Dr. Anderson's valuable "Recreations in Agriculture," &c.) may not inappositely conclude the present subject. The chief object, he observes, to which a man should advert, when he wishes to avail himself of any one peculiarity of an animal capable of being domesticated, is, to observe with care among all the varieties of that species, which individual among them possesses, in the highest degree, that peculiarity of which he is in search; and to select that variety as the parent stock from which to breed. If, among them, there be two that possess the same peculiarity nearly in an equal degree, let him select that one which has some desirable peculiarity belonging to the species in a yet higher degree than the other. If he can meet with three or more varieties that possess the same peculiarity nearly in an equal degree, let

him examine all the other desirable peculiarities which the three or more varieties possess in common, and select that kind which has the greatest number of valuable peculiarities conjoined with that one which first attracted his notice. In this manner let him proceed, invariably attentive to remark all the valuable peculiarities possessed by each individual variety that comes within the reach of his cognizance, comparing it in that respect with those which are already known to him; and *then continue to select that which experience and well ascertained facts shall point out to him as the most useful upon the whole.* Having attained this point, let not his attention be relaxed; but, by carefully examining every individual produced from the *selected breed*, let him be alert in marking those individuals among them which may accidentally possess, in a more eminent degree than the others, any valuable peculiarity he is in quest of, or any combination of peculiarities, for the purpose of breeding from them; and in this manner let him proceed during the whole course of his life. Thus, he will in time bring his stock to possess every desirable quality he aims at, in a much higher degree than any of the varieties in a state of nature could be found to possess; and, by these means, they may be so blended as to unite in the same animal many of those peculiarities, which were separated and disjoined in the original stock.

COWS.

THE value of the respective breeds of milch kine having been stated under the view and description of each species, at the commencement of the present chapter, it will rest with the farmer to make his selection according to the na-

ture of the soil, and to choose such cows as are nearly of the same colour, and of the same country as the bull. It may not, however, be amiss to remark that, in the vicinity of the metropolis, the large Holderness, or short-horned breed, chiefly prevails; although there are considerable numbers of the Suffolk, polled or Galloway, Devon, and Alderney breeds. And since, in order to manage the business of a milk-farmer with success, near large cities or towns, it is essential to procure such cows as will, under all circumstances, produce most milk according to the food they consume: the practice of the southern counties may afford some criterion for other districts. Thus, as the first-mentioned breed of cows (the Holderness) requires rice and succulent food, they may be kept with profit in those places where it can be procured. On the contrary, under less favourable circumstances, the smaller breeds last noticed will be most advantageous; and of these it has been repeatedly proved, by experience, that the Jersey or Alderney cows will produce by much the richest milk; and, if they be kept in equal condition with those of any other breed, will yield as great, if not a greater, proportion of butter.

A perfect cow ought to have a broad smooth forehead; black eyes; large clean horns; a long thin skin; a large deep body; strong muscular thighs; a large white udder, with four long elastic teats; together with every other token requisite in a bull, allowing for the difference of sex. Further, such animal ought particularly to be young; for milch kine are not good for breeding after they are twelve years old, though they will often live a much longer time if their pasture be good, and they be kept from diseases,

Cows are purchased either with the view of being fattened for sale, or for the purposes of the dairy: in the

former case, it will be advisable to attend to the *kindliness* of their skins, and dispositions to fatten; but, with regard to those which are intended for breeding, care should be taken to select those that yield abundance of milk. In fact, those beasts which yield great quantities of milk, never feed quickly; and it is from repeated unsuccessful efforts to unite these two irreconcilable properties, that the different breeds of neat cattle have hitherto been brought to so little perfection. There is, it is true, a middling kind of cows, which give a tolerable quantity of milk, and also keep in pretty good condition; but, though many of this sort will become very fat when they are dried, or their milk taken from them, yet they will not fatten so speedily or so well as those which yield a less portion of milk, and which are more kindly disposed to fatten while they are in a milking state.

It is a general observation among farmers, that their best milk is produced by the red cow, while the black sort is reckoned best for the purpose of breeding, as her calf is usually both stronger and more healthy than the offspring of the red species. This, however, is one of those errors which have been transmitted through a long series of years, without being founded on fact. The red cows have, indeed, been long celebrated for the excellency of their milk; and the calves of black cows have been proverbially deemed good; but, colour, in this respect, is a matter of no moment; the *breed* alone should claim the farmer's attention.

As, however, the dairy constitutes, in many parts of the kingdom, an object of great importance, it is a point worthy of the most deliberate discussion, whether a particular breed ought to be kept for that purpose only, or whether it be preferable to have stock calculated partly for the butcher, and partly for the dairy. "It is probable,"

observes Sir John Sinclair,* “that, by great attention, a breed might be reared, the males of which might be well calculated, in every respect, for the shambles; and the females of which might, when young, produce abundant quantities of good milk; yet, when they reached eight or nine years of age, might easily be fattened. “This,” he justly remarks, “would be the most valuable breed that could be propagated in any country; and, indeed, some of the best English and Scottish breeds have almost reached that point of perfection.”

The cow is supposed, by some eminent naturalists, to arrive at puberty at the end of eighteen months; though instances have occurred where these animals have produced calves before that time. It is, indeed, said by some breeders, in the northern parts of this island, that young cows may be sent to the bull as early as even *one year* old,—a practice which would certainly be an essential improvement where the dairy constitutes a primary object, provided their growth would not thus become stunted, which inconvenience might probably be obviated by good feeding. It is therefore advisable, not to permit cows to take the bull earlier than two years, though the majority of breeders defer it another year; and, in conformity to the latter opinion, the late eminent Mr. Bakewell deferred sending his cows to the bull till they were three years old; but his cows often missed calf, which accident Sir John Sinclair † attributed to this circumstance. In case, however, a cow produces a calf before she enters upon her third year, the animal should be removed from her; and it will be proper to milk her for the three following days, to prevent the

* In a most interesting communication of “Hints regarding Cattle,” inserted in the “Farmer’s Magazine,” vol. iii. p. 156.

† Ibid. p. 160.

udder from becoming sore, but afterwards to forbear milking.

The most advantageous time, in general, for a cow to take the bull is, from the commencement of May till the middle or close of July, so that she may calve in January, and thence forward till March or April. And as it is, in most places, a matter of considerable importance to have an uniform supply of milk throughout the year, we conceive it would prove a source of profit to a farmer, possessing twelve, or any larger number of milch kine, so to arrange the circumstance of breeding, as to have three or more cows *dry** at one time.

In general, the cow conceives after once taking the bull; but, if she should chance to fail, she should go again to the bull within three weeks after. To prevent, however, this accident, it will be advisable, as soon as convenient after her return home, to throw a pail full of water on her udder behind, and to keep her that night separate from any others: for it not unfrequently happens that cows, after taking the bull, will ride each other; in consequence of which they not only misconceive, but also the quantity of milk they yield is greatly diminished.

The desire of having a frequent supply of calves has induced many to have recourse to artificial means, in order to induce cows to take the bull; a measure which cannot be sufficiently deprecated: for the most efficacious mode of

* The period of time during which cows are allowed to run dry previously to calving, is by no means settled. By some graziers they are recommended to be laid dry when they are about five or six months gone with calf; but repeated and successful experiments prove, that, in less favourable situations, six weeks or two months are fully sufficient for this purpose; whereas, if cows be kept in good condition, their milk may continue to be drawn till within a fortnight of calving.

obtaining this object undoubtedly consists in keeping them in good heart; in consequence of which nature will predominate over the animal's body, and cause it to shew signs of procreation through the medium of the creature's constitutional feelings.

The period of gestation, or time during which the cow goes with calf, is about nine months, at the end of which she produces one calf; though instances sometimes occur when two, or even three are brought forth. It may not, however, be useless to remark, that some cows are naturally *barren*, which is said to be the case when a male and female calf are produced at the same time. The male animal is perfect in all respects; but the female, which is denominated a *free martin*, is incapable of propagating her species; it does not vary very materially, in point of form or size, from other neat cattle, though its flesh is erroneously supposed to be greatly superior, with regard to flavour and fineness of the grain.

For about a month or six weeks before the time of calving arrives, it will be advisable to turn the cow into sweet grass, if in the spring; or, if it happen in the winter, she should be fed with the best hay, where that can be conveniently supplied: in which case she will yield a larger quantity of milk than if she had been provided with that food for a longer time, because the fatter a cow is, the less milk is given; and yet, if it be too poor, there is danger lest she should fall in calving. Or she may be taken into the cow-house from the field, or straw-yard, and baited twice a day with green food, consisting of the hearts of cabbages, their decayed leaves being plucked off and given to lean cattle, turnips, potatoes, carrots, or other winter fodder, or with a mixture of bran and oat or bean meal, to which grains may sometimes be added; care being taken, in such case, to increase the quantity of meal.

The day and night after a cow has calved, she should be kept in the house, and be allowed tepid or lukewarm water only for her drink. On the day following, she may be turned out about noon, and be regularly taken in, during the night, for three or four successive days. The animals thus housed should be kept till the morning cold is dispersed, and a draught of warm water ought to be given previously to their being turned into the field, otherwise a premature exposure to the damp atmosphere cannot fail of greatly weakening them.

The hints above stated are given on the supposition that the cow is well, no difficulty having happened during the time of calving; and that she has not *slipped*, or cast her calf before its full time. It should be observed, that the proper position of a calf, while in the uterus, is with its fore-feet and head foremost, its back being towards the cow's back, and its two fore-feet lying parallel to the sides of its head. Where the foetus appears in any other manner, it is termed an *unnatural position*; and the extraction of the calf, under these circumstances, requires the utmost steadiness and dexterity: as, however, no instructions can be adequate to every possible case, it will always be necessary, where this event is apprehended, immediately to apply to some expert cow-doctor, lest the loss of a valuable animal should be the consequence of this injudicious treatment. During this painful operation, particular attention should be given that the pudendum, or *baron* (as it is sometimes called), be not lacerated or torn: should this, however, take place, the part must be sewed gently up; and, if it be swollen, it ought to be washed with lukewarm milk and water.

But, where a cow slips, or casts her calf prematurely, she must be tended with great care; and, whatever may be

the cause, whether abusive treatment, violent exercise, bruises or blows, or that unnatural appetite known by the name of *longing*, every animal that has slipped her calf should be carefully separated from the rest of the herd. Cleanliness, which is an essential requisite in the general management of cattle, ought, in this instance, to be an object of special attention; and, as cows which are liable to drop their calves usually evince some preparatory symptoms between the cause of the abortion and the actual slipping of the fœtus, it will not be altogether useless to bleed them two or three times, as this expedient has sometimes operated as a preventive.

After, however, the calf is produced, it will be necessary to assist the natural functions of the animal, in order to carry off the secundines,* provided in the uterus for nourishing the fœtus; and which, continuing there, in consequence of abortion, would become putrescent, and thus occasion a disagreeable odour that would quickly communicate an infection among other breeding cows. For this purpose, we would, at all times, recommend the following mixture to be given to the cow, as soon after calving as possible:—Let about three quarts of water simmer over the fire; and, when warm, strew in as much oatmeal as will be sufficient to make a strong gruel, carefully stirring the whole, till it boils, that no lumps may arise; then add one quart of ale (or two of table-beer) and one pound of treacle, and carefully incorporate the different ingredients by stirring. This mixture should be given lukewarm: it is peculiarly grateful to cows, which (particularly young ones) will drink it eagerly, after the first hornful,

* Or after-birth:—in the north it is termed the *cleansing*. This excrement ought to be narrowly watched, after it is passed, as cows will often eat it with great avidity.

and are thus prevented from taking cold. And, as it is of importance to regulate the state of the body, this object may be effected by giving a mash of bran, wetted with warm water.*

Further, it will be necessary to milk the cows, especially if they be full of flesh and the udder hard, three or four times a day, for two or three days, and the calf should be suffered to suck as frequently, if in the house; or, in the field, to run with her, and suck at pleasure; care being taken to observe that the mother does not prevent it; for, if the udder or teats be sore, she will naturally be averse to suckling, and danger is incurred of losing both animals: and in case the kernel of the udder is hard, the hardness may be removed by rubbing it three or four times in the day.

CALVES.

ON account of the great utility of the calf, whether intended for breed, labour, or feeding, the means of rearing and keeping this animal have called forth all the ingenuity of the most expert breeders, from the earliest moment of its existence. Hence we shall state the various treatment bestowed upon calves in different counties, and endeavour to bring into one view every useful fact connected with this subject.

* As it would far exceed the limits of this little volume to discuss all the circumstances connected with calving, the Editor with pleasure refers the reader (who is desirous of further information on this subject) to Mr. Clater's valuable "Treatise on the Diseases of neat Cattle and Sheep," recently published.

After the calf is produced, the cow uniformly shows an inclination to clean its skin, by licking off, with her tongue, the slimy matter adhering to the young animal. To facilitate this object, it is a frequent practice to throw a handful of common salt over the calf, or to rub a little brandy on it, in case she should disown it, which will cause the dam speedily to perform this necessary duty; and, about an hour after the birth, half a pint of the lukewarm gruel, or mixture mentioned in the preceding section, may be given to the calf (which prevents it from taking cold) in lieu of the *beestings*, or first milk drawn from the cow; which may be advantageously substituted for eggs in making puddings, or other culinary purposes. This mode of employing the *beestings* is certainly more rational than to give them to the children of cottagers, as is frequently done, whose weak organs may be supposed incapable of digesting such a strong and viscid fluid. There are two modes of feeding calves:—one is to permit them to run about with the parent cow the whole of the first year; the other mode is, to wean them when about a fortnight old, and bring them up by the hand.

The former expedient is generally allowed to be productive of the best cattle, and is adopted in those counties where fodder is abundant and cheap. There is, however, one inconvenience attending this plan, viz. that the udder and teats of the cow are liable to be bruised by the young animal butting against them with its head while sucking. To prevent the injury that might thus happen, a singular practice is pursued in the district of Galloway, in Scotland, whence the London markets are supplied with the finest meat. From the time the calves are dropped till they are able to support themselves, they are allowed to run in the manner above-mentioned; but they are prevented from sucking by means of a small piece of leather,

having little, sharp, iron spikes fixed upon the outside, which is tied on the upper part of the calf's nose in such a manner as to allow it to feed upon the grass without restraint. Hence, as often as the animal attempts to suck, this instrument pricks the cow, and prevents her from letting it flow till the arrival of the milk-maid, who removes the muzzle; so that while she strips two of the teats, the calf sucks the other two; and after the process of milking is completed, the muzzle is replaced on the calf's nose in the manner above-mentioned.

Whether calves are designed to be raised for breed, labour, or feeding, care should be taken that they have a sufficient supply of good pasture; because, if the latter be scanty at first, they rarely, if ever, attain to a large growth. And it may be considered as a general rule, that those calves which are dropped in October or November, are best calculated for increase; as the cow's milk is, at that time, not so well adapted to the purpose of the dairy, while the animal is less susceptible of distempers, and will thrive greatly by the nourishing pastures into which it may be turned in the ensuing spring.

Various plans have been suggested, and tried with considerable success, for rearing calves without any, or at least with a small quantity of milk. The time of weaning them varies, from one fortnight till they are seven weeks old; but the latter period is preferable, on account of the weak and tender state of the calves, if separated from the dam before they are three weeks old. In several counties of England, calves, on being taken from the cows, are, with great pains,* taught to drink *flet*, or skimmed milk in a

* Of the patience and attention requisite in teaching calves to drink, a very inadequate idea only can be formed by those who have never

lukewarm state; for either extreme of heat or cold is hurtful to the beast, and not unfrequently produces fatal consequences. The time selected for this purpose is, from the latter end of January to the beginning of May, about twelve weeks after which, for three or four weeks, they are fed with lukewarm milk and water. Small wisps of fine hay are then placed within their reach, in order to induce them to eat. Towards the end of May, they are turned out to grass, being taken in a few nights, when they have tepid milk and water given them; which is usually continued, though gradually in smaller proportions, during the last month, till they are able to feed themselves, when they totally disregard it. Care, however, should be taken that the grass is short and sweet, and by no means rank or sour. And Mr. E. L'Hommedieu, a spirited agriculturist of New York (*Transactions of the Agricultural Society of New-York*) is of opinion, that calves taken from the cows were much better in a pasture without water than in a pasture of equal goodness with water. The reason he assigns (with which, however, we can by no means coincide) is, that when indulged with water, they drink too much to supply the want of milk; whereas, when deprived of water they are forced to eat grass, containing some moisture, and soon learn to allay their thirst by eating before the dew is dissipated, and on that ac-

witnessed this tedious process. When the animal has fasted two or three hours, the first and second finger of the right-hand, being previously well cleaned, are presented to its mouth; of these it readily takes hold, sucking very eagerly. In the mean time, a vessel of lukewarm milk is placed, and supported by the left-hand, under the calf's mouth, and, while it is sucking, the right-hand is gradually sunk a little way into the milk, so that it may lap a sufficient quantity without stopping its nostrils, which will necessarily compel it to cease, from want of air. Should, however, either from accident, or from too sudden precipitation of the hand into the milk, the calf let go its hold, the attempt must be repeatedly renewed till it is crowned with success.

count eat more than if they could go to water. But, in the county of Suffolk, calves are usually weaned soon after Christmas; when they are fed with lukewarm *flet*, or skimmed milk and water, having bran or oats in it, and some very sweet hay by them, till the grass is ready; though, if the former have carrots, these form an excellent article of food, and render the use of oats unnecessary.

Another mode of rearing calves has been suggested by his Grace the Duke of Northumberland, the design of which is to render the use of new milk unnecessary, while the expence is reduced in the proportion of two-thirds. It is effected in the following manner:—Let half an ounce of common treacle be well mixed with a pint of skimmed milk, then gradually add one ounce of finely powdered linseed oil-cake, stirring it till the mixture be properly incorporated, after which it is to be added to the remainder of a gallon of milk; and the whole, being made nearly of the temperature of new milk, may then be given to the animal; after a short time, the quantity of pulverized oil-cake may be increased. This method has been repeatedly and successfully tried by that nobleman, who, in a communication to Mr. A. Young (by whom it has also been very advantageously adopted), observes that the quantities of the ingredients are so small, “that to make thirty-two gallons would cost no more, exclusive of the milk, than about *sixpence*.” (*Annals of Agriculture*, vol. i. p. 296.) The benefit resulting from this practice must be obvious to every rational farmer and breeder; we doubt not, therefore, but that it will be resorted to in every county where milk is an object of particular importance.

An infusion of hay, called indiscriminately hay-tea, or

hay-water, has been also applied to the purpose of rearing calves with the smallest quantity of milk. In order to make this infusion, such a portion of fine sweet hay, cut once or twice, is put into a small earthen vessel, as will fill it, on being lightly settled with the hand. The vessel is then filled with boiling water, and carefully closed; at the end of two hours a brown, rich, and sweet infusion will be produced, not unlike alewort, or strong tea, which will remain good for two days, even during summer, and which is to be used in the following manner:

At the end of three or four days after a calf has been dropped, and the first passages have been cleansed, as already noticed, let the quantity usually allotted for a meal be mixed, consisting, for a few days, of three parts of milk, and one part of the hay-tea; afterwards the proportions of each may be equal; then composed of two-thirds of hay water and one of milk; and, at length, one-fourth part of milk will be sufficient. This preparation (the inventor of which was, many years since, honoured with a gold medal by the Dublin Society of Arts) is usually given to the calf, in a luke-warm state, in the morning and evening; each meal consisting of about three quarts at first, but gradually increasing to four quarts by the end of the month.

During the second month, according to the mode of treatment stated in the "Essays on Agriculture," published by the society before named, beside the usual quantity given at each meal (composed of three parts of the infusion and one part of milk), a small wisp or bundle of hay is to be laid before the calf, which will gradually come to eat it; but, if the weather be favourable, as in the month of May, the beast may be turned out to graze in a fine, sweet pasture, well sheltered from the winds and sun. This diet

may be continued till towards the latter end of the third month, when, if the animal grazes heartily, each meal may be reduced to less than a quart of milk, with hay-water; or skimmed milk, or fresh butter-milk, may be substituted for new milk. At the expiration of the third month, the animal will scarcely require to be fed by the hand; though, if this should still be necessary, one quart of the infusion (which, during the summer, need not be warmed) will be sufficient for a day.

The economical mode, above detailed, has been adopted in some counties of England, with the addition of linseed-cake, finely pulverized and boiled in the hay-tea *only*, to the consistence of a jelly, without employing any milk in the mixture.* And, as so many excellent artificial grasses are now cultivated for the feeding and fattening of cattle, we conceive that an infusion of any one or more of them would be found more nutritious than if it were prepared from the promiscuous mixtures of grass usually occurring in common hay.

In the northern counties of England, it is a common practice to give the calves equal parts of milk and sweet-whey, made luke-warm; but as this mode often produces scouring, or looseness, we think the following method,

* In the "Letters and Papers of the Bath and West of England Society," vol. v. we have a singular instance of success in this mode of rearing, by Mr. Crook. In 1787, he bought three sacks of linseed, value 2l. 5s. which lasted him three years. One quart of seed was boiled in six quarts of water for ten minutes, to a jelly, which was given the calves three times in the course of the day, mixed with a little hay-tea. Thus he was enabled to rear, in 1787, seventeen calves; in 1788, twenty-three; and in 1789, fifteen, without any milk at all. And he states, that his calves thrive much better than those belonging to his neighbours, which were reared with milk.

which was a few years since communicated to the public by a spirited and experienced breeder, is greatly preferable:—For the first four or five weeks he fed them regularly, but oftener than is usually done, with new and skimmed milk; at the end of which time his calves were gradually taught to drink strong water-gruel, consisting of equal parts of bean or oat-meal, mixed with one half of butter-milk, and carefully mixed with the gruel after the latter is removed from the fire. This method of treatment he is stated to have pursued with great success for many years; his calves being strong and healthy, while every thing that may tend to prevent their growth is effectually prevented.

The following mode of rearing these animals prevails chiefly in the vicinity of Abbey-Holme, in the county of Cumberland, where the calves are remarkable for their size, fatness, and fine white colour: before, however, we detail the plan of the breeders of that place, it will be necessary to remark, that their stock is of various ages, in order that their plan may be carried on without interruption. For the first two or three weeks, the young calves are fed in the common way; and, at the end of that time, are conducted to a feeding-shed. Here two small stakes are driven into the ground for every calf, at the distance of ten inches or a foot from each other; the head of the animal is then put through the intermediate space, a strap or cord being passed round its head on either side of which there is a ring which surrounds the stake. By means of this contrivance the calf is prevented from licking itself, which habit would materially affect its health and growth, while it is not so confined as to be hindered from lying down or rising at pleasure. When the calf is reconciled to its new habitation, the Abbey-Holme farmers supply it with better food than

it has been accustomed to receive; rightly judging that the latter part of a cow's milk is more nourishing, and of a richer quality than that which is first drawn; by this rule, they divide the milk according to the respective age of the animals, invariably giving the richest part to the oldest calves; so that, as the milk may lessen or improve in quantity or quality, they can, at all times, regulate their stock by diminishing or augmenting their numbers. Another circumstance peculiar to that district is, the varying of the temperature of the feeding sheds according to the alteration of the different seasons. Cleanliness is also an object of rigorous attention, the place being kept constantly dried, and supplied with a proper quantity of good litter. And in case any of the animals' appetites fail, so that they do not regularly take their food, they are immediately consigned to the butcher, and their place is occupied by the next in age.

In the county of Norfolk, calves are fed with skimmed milk, in which is mixed a little wheaten flour; they have also chopped turnips in a trough, and some hay in a low rack. As soon as these animals learn to eat turnips freely, they are no longer supplied with milk, those roots, with the addition of a little hay, furnishing them both with food and drink. The period of raising calves in the above-mentioned county is from Michaelmas to Candlemas; but the time of feeding them wholly with turnips varies according to circumstances or accident. Where there are older calves that have been accustomed to these roots, the younger ones soon acquire the method of breaking and eating them, by picking up the fragments left by the former.

Towards the month of March, those which are first reared are turned out among the fattening bullocks during

the day; and are sheltered in the night; though, if the weather prove favourable, they are in a few days turned out altogether. In the succeeding summer they are kept in clover, or other luxuriant grasses, and, the following autumn, are sufficiently strong to stand in the straw or fold-yard. This circumstance is considered as a chief advantage to be derived from rearing calves early in the season; as those which are raised during the spring require two years nursing.

In Holland, we are informed that the calves are reared in long and narrow, but tolerably lofty suckling-houses. The pen in which the calf is kept is so narrow that it cannot turn round, so that it can only go backwards to the end of the pen, which is also short, and forwards to the door: the house is kept in total darkness, and the pen kept perfectly clean and sweet. When the suckler comes to administer the milk, a small hole is opened, sufficiently big to admit its head to be thrust out, and which is made in the door-way; as soon as the animal perceives the light, it advances towards it, pushes out its head, which the suckler puts into the milk-pail; and, being taught to drink the milk, it very soon gets fat, and much quicker than by either of our modes, where the calf is usually tied up, or is permitted to run about in an open place. The Dutch farmers hang up a piece of chalk near the door, for the animal to lick; and when the calf is about to be removed, the pen is so contrived, as to height, that, when the door of the suckling-house is open, it falls down on the tail of the cart, and the animal walks into it, and is secured. The floor of the Dutch calf pens is of lattice work, so that it always lies dry.*

* Malcolm's "Compendium of Modern Husbandry," vol. i. p. 354.

The subsequent method of raising calves, by Mr. Wm. Budd, of Boston, in America, which obtained the prize from the Agricultural Society of Massachusetts, we give in his own language, extracted from his communication to that society.

“ Take the calves when three days old from the cows, and put them into a stable by themselves; feed them with gruel, composed of one-third barley, two-thirds oats, ground together very fine, sifting the mixture. Each calf is to receive a quart of gruel morning and evening, and to be made in the following manner:—To one quart of the flour add twelve of water, boil the mixture half an hour, let it stand until milk-warm. In ten days, tie up a bundle of soft hay in the middle of the stable, which they will eat by degrees. A little of the flour, put into a small trough, for them occasionally to lick, is of service. Feed them thus till they are two months old, increasing the quantity. Three bushels of the above mixture will raise six calves.”

Mr. Clift, of the New York Agricultural Society, takes the calf from the cow at two or three days old; he then milks the cow, and while the milk is warm, teaches the animal to drink by holding his head down into the pail; if the calf will not drink, he puts his hand into the milk, and a finger into the mouth, till the beast learns to drink without the finger. After he has been fed with new milk for a fortnight, the cream is taken off the milk, with which an equal or larger portion of thin flax-seed jelly is mixed, and the whole is given milk-warm. Thus, as the spring is the most favourable season for making butter, he is enabled, during the six or seven weeks the animals are kept previously to weaning, to make as much butter as they are worth; a practice which merits the attention

of our English farmers, to whom it will afford a very essential saving, particularly in those counties where butter forms a chief article of manufacture.

In the rearing of calves much, however, depends on the regularity of feeding them; the common practice is, to supply them with food twice in the day, in the morning and at evening, when they generally receive as large a quantity as their craving appetites can take. Hence the digestive organs are necessarily impaired, and numerous animals either become tainted with disease, or perish from the inattention of their keepers; whereas, by feeding them thrice in the day, at equidistant intervals, and allowing sufficient room for exercise, they will not only be preserved in health, but they will also greatly improve in condition.

Veal being a favourite article of diet, the fattening of calves is an object of no small importance, particularly in the vicinity of the metropolis, where the lands are more profitably occupied in other branches of rural economy. Hence various sorts of food are provided, and numerous modes of treatment have been recommended. Their provender is now, for the most part, turnips, potatoes, grains, pollard, and sweet hay; but the most effectual, and consequently the best way, is to keep them in pretty dark places, in coops, lest they should fatigue themselves by sporting too much in the light, which would be injurious to them. Farther, as cleanliness is an indispensable object in fattening cattle, it should, in the present case, be particularly attended to. For this purpose, the coops ought to be elevated at such a height from the ground that their urine may pass freely off; fresh litter should be supplied every day, in order that they may lie dry and

clean; and a large chalk-stone should be suspended over the coop, so that the calves can easily lick it.

With the same view, a simple and effective contrivance is employed in the county of Gloucester, where it is termed a calf-stage, and which is thus described by Mr. Marshall, in his "Rural economy of Gloucestershire:"—

The house or room-stead, wherein it is placed, measures twelve feet by eight: four feet of its width are occupied by a stage, and one foot by a trough placed in its front, leaving three feet as a gang-way, into the middle of which the door opens. The floor of the calf-stage is composed of laths, about two inches square, lying lengthway of the stage, and one inch asunder. The front fence is formed of staves one inch and a half in diameter, nine inches from middle to middle, and three feet high; they are entered at the bottom into the front bearer of the floor (whence cross joints pass into the back-wall), and are rendered steady at the top by a rail, which, as well as the bottom piece, is entered at each end into the wall. The poles in the upper rails are sufficiently wide to permit the calves to be lifted up and taken out, in order to admit the calves; one of which animals is fastened to every second stage, by means of two iron rings joined by a swivel; one ring playing upon the stave, while the other receives a broad leathern collar, buckled round the calf's neck. The trough is for the reception of barley-meal, chalk, &c. and also to rest the pails upon. Two calves drink out of one pail, putting their heads through between the staves. The floor of the stage is about one foot above the floor of the room. It is conceived that it would be prejudicial to the calves if the floor were hung higher, lest they should be too cold during severe weather, from the wind drawing under it; but this inconvenience may be

obviated by thrusting litter or long strawy dung beneath it. The stages here described (it should be observed) are only fit for calves that are fed with the pail, and not for such as suck the cow.

It is a common practice to bleed calves when they are four or five weeks old, and again, a little time before they are killed, with a view of increasing the whiteness of their flesh: the quantity of blood taken is almost two quarts, or more, according to the age and strength of the calf. The operation of bleeding is, therefore, frequently repeated by some persons, though it does not appear to be altogether necessary; as the most experienced breeders are of opinion, that it is sufficient to bleed them twice, drawing from them such a quantity at each time as their age and size will allow, without hazard of destroying the animal.

With regard to those calves which are intended for the draught, it will be advisable to accustom them, while young, to be handled and stroked, and tied up to the manger; as they may, when they come to be broke, be handled less apprehension of danger.

The best time for castrating male, or spaying female calves, undoubtedly is when they are fifteen or twenty days old, as at that time there is least danger, provided they be in full health; though, in conformity to the opinion of some eminent natural historians, this operation is in some places, particularly in Scotland, deferred till the animals are three years old. Formerly this object was effected by tying a strong cord round the small part of the testicles, near the body, till these became completely dead, when they were either suffered to remain till they dropped spontaneously off, or were cut off, and the animal was

perfectly castrated. Modern ingenuity, however, has devised a better mode of eradicating the testicles, by excision; but as this cannot be effected without resorting to an experienced farrier, or cow-doctor, we decline to give any directions respecting an operation which, if unskilfully performed, must prove greatly injurious to the animal. Let it therefore suffice to state, that, after the calves are castrated or spayed, as the difference of sex may require, great care ought to be taken that the wounded part be not exposed to the air, which might otherwise occasion loss of blood or other accidents. For the first two or three days, the animals should be kept quiet and tolerably warm, and be dieted according to their weakness; but they ought not to be allowed too much drink till they are perfectly recovered, after which time they may be treated in the usual manner.

As cattle, particularly bulls, are frequently mischievous with their horns, it has been suggested, to obviate the accidents that would otherwise happen, to *cut off the horns of calves*. The following method is recommended by Mr. Paul, cooper, of Woodbury, New Jersey (North America).

When the calf is about a month old, and the horns have risen above the skin, cut off the knobs close with a chisel; and with a sharp gouge pare them clean from the bone: then sear the wound and fill it with sturgeon's oil or hog's lard. It is materially important that this operation should be performed on all bull-calves that are not castrated.*

* "Memoirs and Transactions of the Philadelphia Society for promoting Agriculture," vol. i. p. 25.

OXEN.

THE OX is an animal of no small utility for various purposes of husbandry, particularly for draught, though its real value has only become generally known within a few years.

The most valuable breeds of these animals for working, in this island, are those of Devonshire, Sussex and Herefordshire, together with the oxen reared in the counties of Somerset, Glamorgan, and Pembroke, the distinctive characters of which have already been specified in the view of the various breeds of black cattle found in the British isles, prefixed to this chapter.*

We, therefore, proceed to state the principal objects requisite to be attended to in purchasing these animals; for the husbandman, who intends to stock his land, must purchase before he can breed his own cattle; after which the most advantageous methods of working them, together with a comparative view of the merits or demerits of oxen and of horses will present themselves for discussion.

A good ox for the plough should be neither too fat nor too lean; as in the former case he will be too lazy, and in the latter he will be too weak, and unfit for labour. His body ought to be full, joints short, legs strong, and his eyes full; and every part symmetrical, or well put together, so that his strength may be easily seen. Oxen vary much in colour, like most other domestic animals; but, whatever be the colour, their coat or hide should be glossy,

* See p. 10—17.

thick and smooth to the touch: for, if it be harsh, tough, or thin, there is reason to suspect that the beast is out of order, or at least of a weakly constitution. Another requisite is, that he answers to the goad, and be obedient to the voice; but this animal can only be brought willingly to bear the yoke, or be easily governed by lively but gradual and gentle treatment. Those calves, therefore, which are designed for the yoke, should not be broke earlier than two and a half, or three years, lest they be overstrained; nor should that operation be deferred longer than three and a half, or four years, as they will become forward, and too stubborn to submit to the yoke.

The strength of this animal, when properly trained and managed, is very great, and he has patience to endure fatigue; but, being naturally slow, he must not be exerted beyond his usual pace. The only method by which success can be attained is, by patience, mildness, and even by caresses; for compulsion and ill-treatment will irritate and disgust him. Hence great assistance will be derived from gently stroking the animal along the back, by patting him, and encouraging him with the voice, and occasionally feeding him with such aliments as are most grateful to his palate. It will also be proper to tie his horns frequently, and after a few days to put a yoke upon his neck, when he should be fastened to a plough with a tame old ox, of equal size; next the oxen should be employed in some light work, which they may be suffered to perform easily and slowly: thus they will draw equally, and the young steer will be gradually inured to work. After working in this manner, he should be yoked with an ox of greater spirit and agility, in order that the steer may learn to quicken his pace; and by thus frequently changing his companions, as occasion may allow, he

will, in the course of the first month or six weeks of his labour, be capable of drawing with the briskest of the stock.

After a steer is thus properly broken, it will be advisable, for the future, to match such as are intended to draw in the same team, or yoke, attention being paid to their size, strength, and spirit or temper; otherwise, by being unequally matched, they will not only spoil their work, and be greatly disqualified for draught, but also, by being urged beyond their respective natures, through severe usage, they will inevitably receive material injury.

Another circumstance of essential importance in breaking in young oxen is, that, when first put to work, whether at the plough or in teams for draught, they be not fatigued, or over-heated: till they are thoroughly trained, therefore, it will be necessary to employ them in labour only at short intervals; to indulge them with rest during the noon-day heats of summer, and to feed them with good hay, which, in this case is preferable to grass.* In fact, while oxen are worked, they must be kept in good condition and spirits, by moderate but wholesome sustenance. Farther, on their return home from labour, it will greatly contribute to preserve their health, if their feet be well washed previously to leading them into their stalls; otherwise diseases might be generated by the filth adhering to them; while their hoofs, becoming soft and tender, would necessarily disable them from working on hard or stony soils. The extremes of heat and cold ought

* It is not, however, absolutely necessary to have them home in the middle of the day. In Devonshire this is never done: the practice in that district is, to carry a bundle of hay *into the field*, and to let the beasts rest there; and this is found to answer every purpose.

also to be carefully guarded against, as disorders not unfrequently arise from excess of either temperature, and they are peculiarly exposed to fevers and the flux, if chased up and down, especially in hot weather.

The following mode of training and working oxen, which has been successfully adopted in North Britain, we give in the words of the farmer by whom it is practised, from the 3d vol. of "The Farmer's Magazine," p. 450; a work whose extensive circulation is the best proof of its merit.

"Out of my stock of cattle," says he, "I select, when two years old (that is, after harvest, when they are rising three), four of my stoutest, best-shaped *stots* from the field. These, to accustom with harness, I bind up in my oxen byre every night, for a week or two; and they are then taken out in pairs, and put into the plough with a pair of older-trained oxen yoked before them. This keeps them steady, and prevents their running off. After being yoked in this manner two or three times, I turn them again amongst the cattle in the straw-yard, where they remain until spring. They are then three years old. I yoke them all four, after training them as above stated, in a plough by themselves, which requires a little boy to drive; and in that way they are used until four years old, when they are worked in pairs as horses, by one man only, and do the same work at ploughing; for at carting, &c. I never use them, having as many horses as do that part of my work. When used in pairs, one man works two yokings, and the cattle only one each. If, however, I had occasion for two cattle-ploughs, each pair might work very well two yokings, the same as horses."

The same intelligent correspondent also remarks, in ad-

dition to the above: "If, when three years old, eight *stots* were worked, four and four *alternately*, it would be a great relief; and have uniformly found that cattle *moderately worked* thrive better than those that are idle, or unemployed."

The general character of the ox is patience and tractability, though young steers sometimes prove refractory and vicious; which, however, is in most instances the result of defective management, or of bad treatment when first *broken* for the yoke. When, therefore, an ox is unruly or stubborn, it will be advisable to keep him till he is hungry; and, when he has fasted long enough, he must be made to feed out of the hand. On his returning to labour, he should be tied with a rope; and, if he at any time becomes refractory, gentle measures should be adopted, as above described, in order to bring him to work readily and quietly.

In working oxen to advantage, much depends on the mode of harnessing them, and upon what has been termed the *principle of draught*; which Lord Somerville has justly remarked, depends on the joint power of the neck, and the base of the horn.* "In Portugal, these animals are harnessed in the following manner:—A long leather strap is wrapped round the yoke, whence it passes round the lower part of the horns, and is again fastened to the yoke. By this contrivance the heads of the oxen become more steady while performing their work, and these useful animals are rendered more tractable." In France, the oxen are worked by the head; and this method was introduced into Ireland by the Earl of Shannon, with great success.

* "System followed by the Board of Agriculture," &c. 8vo. 1800.

Connected with the subject of draught is another, which has only received, of late years, that attention which it required, viz. the *shoeing of oxen*; a necessary operation, which, when carefully executed, will not only conduce to the animal's comfort and health, but also to the farmer's profit; as he will thus be enabled to draw both with greater speed, and with superior effect. According to the common practice, the animal is first *cast*, or thrown, and his legs bound together in the usual manner; he is then forced nearly upon his back, and his feet are hoisted up to a convenient height by means of a forked pole, the forked end taking the bandage that binds the feet, while the opposite end is firmly fixed in the sward upon which they are thrown; the farmer then proceeds to affix the shoes in a manner similar to that practised on horses. By this simple contrivance, the operation acquires great firmness, steadiness, and conveniency; but it is attended with one great disadvantage, as oxen are apt to become unruly on seeing their companions thus roughly treated; and many valuable cattle are often rendered completely useless. To obviate such accidents, an ingenious machine has been invented in order to secure the animal, by means of short posts. On these the fore or hind legs are fastened, as circumstances may require, and thus the shoes are applied without any possibility of injuring the beast. It has indeed been suggested,* (and we think the plan might be easily carried into effect) that if calves, intended to be reared for work, were accustomed, while young, to have their feet taken up, and their hoofs beaten with a hammer; and that, if this practice were repeated during the winter, while the steers are in the yards, they might afterwards be shod in the same manner, and with equal facility as horses.

* Marshall's "Rural Economy of the West of England," vol. ii. p. 285.

Few subjects have, of late years, more exercised the ingenuity of theorists, and the attention of farmers, than the question concerning the superiority of oxen to horses. The use of these animals, even under many impediments, has been persevered in for many ages, and will continue in every country where a breed of cattle exists which are active of themselves, and of a form and size well calculated for labour.

In order to exhibit an accurate view of this interesting question, we shall proceed to contrast the respective services of horses and oxen, both with regard to their original price, and also with respect to their labour.

I.—WITH REGARD TO THEIR ORIGINAL PRICE, OR COST.

The prime cost of an ox, upon an average, is at least one half less than the price of a horse; hence it is obvious, that an ox of the value of 7l. or 8l. will perform the same quantity of work as a horse worth 14l. or 16l. This is a circumstance of no small importance to a young farmer, to whom labouring cattle are the most expensive part of his stock, as he can thus be enabled to branch out his capital into various useful channels.

II.—WITH RESPECT TO LABOUR.

By well-known means the nature of the bull is tamed; and, when properly *broken*, the ox becomes as tractable, and may be trained to the plough or to draught as easily as horses. Of this we have numerous instances. Messrs. Calleys, of the county of Northumberland, employ 150 oxen

in the draught, which practice they have followed with great success for more than thirty years. The animals are used singly in carts, and two in a plough, with cords, without a driver; and thus they perform their allotted work of ploughing, carrying corn, dung, &c. in all respects as well as two horses, though not with equal celerity. The late Lord Kaimes states,* that Colonel Pole, lately deceased, of Radburne, in Derbyshire, ploughed as much ground with *three* oxen, as his neighbours did with four or five horses; feeding them in summer with grass, and in winter with straw, when moderately worked; or when much worked, with hay or turnips. The late Right Hon. Edmund Burke, at his ground near Beaconsfield, in the county of Bucks, ploughed one acre *per diem* with *four* oxen, while his neighbours performed the same work with an *equal number* of horses.

For the two following facts, which evince the superiority of oxen, even under circumstances unfavourable to these animals, we are indebted to that enlightened agriculturist, Lord Somerville,† of whom we have already had occasion to make honourable mention.

At the last meeting, in 1803, of the Dublin Society, his lordship was informed, by a spectator of undoubted veracity, that several ploughs were 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 animals, he states, were not selected from the

* "The Gentleman Farmer," p. 30, 5th edit. 1802; an interesting and practical work on husbandry, to which we are indebted for some of the following hints and facts.

† "Farmer's Magazine," vol. 4. p. 343.

breeds most esteemed for labour, but from the oxen of that country.

Of the succeeding instance, Lord S. was himself an eye-witness:—In May, 1803, a meeting was held at Burnham Wyck, in the county of Essex, to award three prizes which were given for the best ploughing. Upwards of twenty ploughs started, three of which were each worked by three pair of oxen, without drivers. These animals 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 his lordship's remembrance, about twelve or fourteen minutes between the average of the horse and ox-teams; so that, supposing them to be an hour and a 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 do not require the dressing and attention demanded by those whose perspiration escapes by the skin.

The following is his lordship's method of working oxen: the animals are *broken in* at three years old, their first half year's work being easy. At six years old they are sold to graziers, and in eight months they come to Smithfield good beef. In the intervening period his work is done at the rate of about eighty acres of tillage to four oxen; and his twelve oxen, exclusive of the three-year-old steers, will work thirty acres of land *per week* (when not employed in carrying lime or manure), which is ten acres per week for each four oxen, or five acres for each pair; that is, two acres *per diem* for four days in the week, for each team of four, allowing them two resting days. Thus their daily labour is completed in seven hours and a half, which gives

them sixteen hours for rest. Lord S. remarks, that if they were allowed corn they would probably do more work; and, if they did less, he would not employ them at all. He allows one horse to every 100 acres of land, for extra work, and no larger number.

Lastly. Before we conclude the present contrast, as it respects *labour*, we would observe, that oxen are preferable to horses for *steady* draught, as they uniformly pull to their strength, without variation; whereas the last-mentioned animals are apt to stop on encountering the slightest resistance. And though it is objected, that oxen are unfit for draught in mountainous situations, yet, let it be recollected, that under such circumstances *no draught can well be used*; and that the descending of steep hills is, in all respects, as dangerous to horses as to oxen. In addition to the facts already stated, it may be added, that notwithstanding oxen have less air and spirit than a horse, their motion is not materially slower; and as the labours of husbandry are regular and progressive, the step of these animals will be found little inferior to that of the horse. They are, indeed, reputed to be less expeditious for galloping or trotting; but repeated instances have occurred, where Sussex oxen have *beaten* horses at plough in the deepest clay; and the Herefordshire breed is admitted to be superior to any other in long journeys, for conveying chalk, or other heavy substances, over a hilly and flinty country road. In the north of England, we understand that it is not an unfrequent occurrence, to see a light ox saddled, and briskly trotting along the road, obedient to his rider's voice: the Devonshire cattle also walk with uncommon speed; and if four or five horses can till 100 acres of land, the same work might doubtless be equally well performed by a similar number of the Devonshire

or Herefordshire breeds, provided they were trained and fed with a special view to *speed*, with the same care as horses.

III.—COMPARATIVE EXPENSES OF KEEP AND GENERAL SAVINGS.

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|---|---|
| <p>1. Oxen are easily supported, during the severity of winter, on straw, turnips, and other vegetables. Besides, as ruminating animals possess stronger digestive organs, every thing capable of affording nourishment is extracted from their food.</p> | <p>1. Horses require to be fed with hay, oats, beans, articles which can only be purchased at a heavy expense. The digestive powers of a horse are weak : so that upon an average, two thirds more are necessary for him than are required by an ox, in order to afford the same nourishment.</p> |
| <p>2. Every day that oxen are employed, they earn more than their keep; while, if properly fed, they will require no other care.</p> | <p>2. A horse not only requires more stable attendance than oxen, but also often exhausts the property of little farmers, who exert themselves in order to keep a <i>fine team</i>.</p> |
| <p>3. The <i>gear</i> necessary for a pair of oxen may be procured at a very moderate price.</p> | <p>3. The harness of a team is, in general, an expensive article, especially when the vanity of the owner induces him to have it decorated with paltry brazen ornaments.</p> |
| <p>4. At the end of five, six, or seven years, during which they will have more than compensated the cost of keeping them, they are in prime order for fattening; and when fit for sale, produce to their owner a handsome sum, varying indeed according to the state of the markets, but ultimately bring-</p> | <p>4. Horses become less valuable every year they are kept. They are liable to spasms, farcy, glanders, foundering, cankers, and a host of diseases too numerous to be here specified, from all which oxen are exempted (these animals being subject to few diseases, except a scouring or looseness,</p> |

ing him a considerable clear profit. The same event will follow, if, through accident, the beast is lamed, or rendered unfit for work.

that reduces their value); while horses are, by sudden illness, or lameness, speedily diminished in value, from *forty* to *four* guineas, and at length become food for dogs, their hide only being in any degree serviceable to mankind.

Another advantage arising from the keeping of oxen in preference to horses will be, the introduction of a more lenient conduct towards those useful animals; and, as has been judiciously observed, in proportion as ox teams are used, they certainly diminish animal suffering; for no man will work his ox team so hard, or feed it so inadequately, as horse teams are sometimes worked and supported, merely with the view of gratifying a false vanity.

The following comparative Statement of the Expense of Keeping, Management, &c. of Horses and Oxen, will probably elucidate the Facts above attempted to be brought together.*

HORSE,	OX.
Prime cost of a horse at four years old.....£30 0 0	Prime cost of an ox at three years old.....£20 0 0
Keep, shoeing, attendance, &c. &c. for ten years, at 30 <i>l.</i> per Annum 300 0 0	Keep, &c. for ten years, at 10 <i>l.</i> per Annum..... 100 0 0
<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> £330 0 0	<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> £120 0 0
Deduct the value of skin and carrion..... 1 1 0	Deduct the value of fat.. 40 0 0
<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> Total cost of horse £328 19 0	<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> Total cost of ox.....£80 0 0
Ditto of ox 80 0 0	
<hr style="width: 100px; margin-left: auto; margin-right: 0;"/> Difference in favour of the ox £248 19 0	

* Communicated to the "Farmer's Magazine," vol. v. p. 181, by an intelligent agriculturist of the county of York.

Of this statement we have only to observe, that, as it is a fact that *one draught horse* will, exclusive of hay, consume more corn than a family of ten or twelve persons, and as it is morally impossible that small farms, worked by *heavy horses*, can find constant employment for them, the community must, under such circumstances, not only sustain an annual loss to the amount of several millions, but also lose the benefit of a supply of *good beef* for home consumption, and especially for the use of that meritorious class of subjects, the BRITISH SAILORS.

In the preceding estimate of the merits and demerits of horses and oxen, though it has been endeavoured to shew that the latter animals are infinitely superior, and consequently preferable to the former; yet we would be understood to recommend the use of oxen only where they *suit*, or are consistent with local and other circumstances; for, doubtless, where counties, or districts, do not possess a breed of cattle well calculated for work, as oxen; or on small farms, from which fairs must be attended at a considerable distance, to purchase a few, consequently at a great expense per head, and possibly without a supply of land for fattening any, the loss in such case is almost certain. It will, therefore, be proper for the farmer who is thus situated, to avail himself of the bulls of the country, which may be advantageously substituted for, and probably much cheaper than oxen, and which may be broken in and worked with equal facility. Thus, on all light sandy soils, as Mr. Billingsley justly remarks (Bath Papers, vol. x. p. 66), such as Norfolk, Suffolk, &c. single ploughs of different constructions, drawn by two horses, without a driver, may, in cheapness of execution, nearly approach the double furrow, drawn by four oxen. But, on all level soils, unencumbered with stones, and where good pasture may be found for *summer*, and good hay for *winter-keeping*,

oxen with the double plough may be considered as justly entitled to a preference.

As, however, there is some business on a farm, in the performance of which horses are greatly superior to oxen or bulls, the husbandman will find it conducive to his interest to keep a few draught horses for that purpose. But notwithstanding all the acknowledged advantages resulting from the employment of oxen on farms, there are two objections sometimes urged against this system, which we shall briefly notice. The first is, that the working of oxen injures the meat, rendering it hard about the neck; but this is altogether unfounded. There is, no doubt, as Mr. Malcolm pertinently remarks, but that, if an animal were slaughtered the moment he came from work, after three, four, or more years continual hard labour, the flesh about the shoulders of such ox will be callous. "But, put that ox up to fatten, and a revolution presently takes place; he thrives more kindly than one which has not been worked; fresh matter is generated and diffused in the nature of fat; it does not attach itself to one part of the body and leave all the rest without any; it does not fix itself to the ribs, and leave the shoulders bare. The juices flow through the veins there, as well as every where else; and, by consequence, whatever tends to fatten other parts, will do so by the shoulders; and I think it is hardly probable that, where there is any quantity of fat, the flesh beneath it can be hard, because it is the peculiar property of fat to make things soft, especially flesh."*

A second objection, which is more prevalent, is, that oxen are apt to be mischievous in hot weather, when attacked by flies and other insects; but in the opinion of the

* Malcolm's "Compendium of Modern Husbandry," vol. i. p. 359, 360.

intelligent agriculturist last mentioned, if these animals were worked early and late, and lay by during the heat of the day, the danger would, in a great measure, be removed. In addition to this remark, we would observe, that the objection now in discussion would be obviated by employing only *hornless* oxen. For the purposes of work, Mr. Marshall considers it as obviously necessary to obtain a breed without horns; which he thinks may be effected, since there now are many polled or hornless breeds of neat cattle in this country, from which (as in the case of sheep) a hornless race might, by persevering attention and industry, be raised. Nor, in his opinion, would any disadvantage result from this practice; because, to cattle in a domesticated state, horns are altogether useless, and also because *horn*, as an article of commerce, is not, at present, held in that request which it formerly was. In the prosecution of this design, the first step Mr. M. directs is, to select females; and, having observed their defects and imperfections, to endeavour to correct and improve them by a well chosen male.

The preceding remarks on Black Cattle may be terminated by a few hints on the subject of their *age*; which is or should be, primarily attended to by the farmer and breeder, to whom the appearances of the *teeth* and *horns* will afford some aid in forming his judgment on their age.

Until they are turned two years, Black Cattle do not cast any *teeth*: at the end of that time they get two new teeth; and at three years old, two others. Every succeeding year, until they are five years old, they get two fresh teeth: they are then said to be full-mouthed; although this is not in fact the case, as the two corner teeth (which are renewed last) are not perfectly up until they are six.

After the signs, afforded by the *teeth*, become uncertain, the *horns* may be resorted to, to ascertain the age. When three years old, they are smooth and handsome; after which period there appears a circle or wrinkle, which is annually increased as long as the horn remains; so that according to the number of circles or rings, the age of a beast may be ascertained with tolerable precision, unless the wrinkles are defaced, or artificially removed, by filing or scraping, a fraudulent practice which is too frequently adopted, in order to deceive the ignorant or inexperienced purchaser with respect to the real age of the animal.

CHAP. II.

SHEEP.

THE breeds and varieties of breeds, which are dispersed through the British islands, are very numerous; so that each county may in fact be said to possess its peculiar breed, the value of which being too frequently over-rated by prejudice and the force of custom, it becomes no easy task to improve the breed of these useful animals.

In a wild or natural state, the sheep is a lively vigorous animal, and capable of supporting fatigue. When domesticated, it loses these properties, the absence of which is amply compensated by the superior advantages derived from this sort of cattle. Sheep, indeed, constitute an essential part of a farmer's live stock and profits: and, as particular attention has of late years been bestowed upon the improvement of the various breeds, we shall first give a brief view and description of the principal varieties, exhibiting their specific characters, and the peculiar advantages they respectively possess.

CLASS I.

SHEEP WITHOUT HORNS.

I.—DISHLEY OR NEW LEICESTER BREED.



SPECIFIC CHARACTERS.—The heads are clean, straight, and broad; the bodies round, or barrel-shaped; eyes fine and lively; bones fine and small; pelts thin.

PECULIAR ADVANTAGES OF THIS BREED.—The wool is long and fine, well calculated for combing, and weighs upon an average eight pounds per fleece, when killed at two years old. The Dishley breed fatten kindly and early, being admirably calculated for the market, thriving on pastures that will scarcely keep other sheep, and requiring less food than others. Tolerably hardy and vigorous.

The Dishley sheep are found chiefly in Leicestershire and the neighbouring counties, whence this breed is gradually dispersing through the kingdom.

II.—LINCOLNSHIRE.

SPECIFIC CHARACTERS.—The faces are white; bones large; legs white, thick, and rough; carcasses long, thin, and weak.

PECULIAR ADVANTAGES OF THIS BREED.—Wool fine and long, from ten to eighteen inches, weighing per fleece, when killed at three years, an average of about eleven pounds. Flesh coarse grained. *Naturally*, these sheep are slow feeders, calculated only for the richest pastures: but they are now, we understand, so generally improved by new Leicester tups, that they are probably in a great measure free from the defects incident to the original Lincoln sheep, viz. being slow feeders, having too loose a form and too much bone, together with coarse-grained flesh. Constitutions tender. As its name implies, this breed occurs principally in Lincolnshire, and other rich grazing districts. The principal excellency of this breed is in the large quantity of wool it affords, which pays for their being kept longer before they are fattened.

VARIETY I.

TEESWATER BREED.

SPECIFIC CHARACTERS.—The bones are finer; the legs longer; and the carcass is more heavy and firm; the back and sides are wider than in the original breed.

PECULIAR ADVANTAGES OF THE TEESWATER SHEEP.—Wool not so long as that of the preceding sort, weighing about nine pounds per fleece, when killed at two years old. Flesh finer grained, and fatter than the parent stock. Fe-

males singularly prolific, generally producing two, and often three lambs each. Constitution weak. Slow feeders, suited only for the finest pastures; consequently less profitable than the smaller sized, but quicker feeding sorts of sheep. Capable of great improvement, by crossing with New Leicester or Dishley rams.

This race is bred chiefly in the extensive, fertile, sheltered, and enclosed tracts of pasture watered by the river Tees in Yorkshire.

VARIETY II.

COTSWOLD, OR IMPROVED GLOUCESTER BREED.

SPECIFIC CHARACTERS.—In most respects they resemble the parent breed, but are superior. They are chiefly found in Gloucestershire.

PECULIAR ADVANTAGES.—Wool not so long as that of the original sort. Mutton fine grained and full sized, and coming heavy to the scale. Capable of great improvement by proper crossing.

In this breed the ewes are usually put to the tup so as to have lambs at two years old: they mostly produce two lambs each, in the proportion of nearly one-third of the whole. They may be kept for breeding, when of the proper improved sort. It is said, the wethers afford most profit when killed so early as two years old, as they are apt to become too fat when kept longer.

III.—DARTMOOR, OR DEVONSHIRE NATTS.

SPECIFIC CHARACTERS.—Faces and legs white; necks thick; bones large; backs narrow, but back-bone high; sides good.

This race is principally confined to the moor, in the county of Devon, whence the sheep derive their name.

PECULIAR ADVANTAGES.—Wool long, weighing upon an average nine pounds, when killed at about two years and a half. Improves materially by crossing with the Dishley breed.

IV.—HEREFORDSHIRE, OR RYELANDS.

SPECIFIC CHARACTERS.—The faces and legs are white; size small; carcass well shaped.

PECULIAR ADVANTAGES OF THIS BREED.—Wool very fine and short, growing close to their eyes, and weighing, when killed at four years and a half, upon an average, two pounds per fleece. Patient of hunger. Flesh fine grained. Constitution tender, so as to require to be sheltered in winter. Very profitable, no breed being supposed capable of subsisting on so small a quantity of pasture as this sort requires. This breed has been crossed, very successfully, with the Merino or Spanish race.

This breed has also been crossed with the Dishley, and thus an useful kind of sheep has been produced: both the wool and the carcass have been increased in weight, but *deteriorated* in regard to fineness. It is also asserted, that this crossing renders the subsequent animals more tender than the pure Ryeland stock.

V.—SOUTH DOWN.



SPECIFIC CHARACTERS.—Faces and legs grey; bones fine; neck long and small; low before; shoulder high; light in the fore quarter; sides broad; loin tolerably good; back-bone rather too high; thigh full; and twist good.

PECULIAR ADVANTAGES.—Wool very fine and short (the staple being from two to three inches in length) weighing an average of two pounds and a half per fleece, when killed at two years old. Flesh fine grained, and of excellent flavour. Quick feeders. Constitution hardy and vigorous. Capable of great improvement.

This breed has been found to consume less food in proportion to weight than the Norfolks, yet keep in better order. Young sheep produce the best lambs: the crones are therefore constantly sold at four or five years old; and if this were done earlier, it is supposed it would be more profitable.

The South Down sheep are principally bred on the dry chalky downs of Sussex, whence this valuable breed has gradually been introduced into various districts. The figure

above delineated, is from a South Down ewe, part of Mr. Ellman's stock, exhibited at Lord Somerville's cattle show, in 1806.

VARIETY.

THE CANNOCK HEATH SHEEP,

(Which derives its name from Cannock Heath, in the county of Stafford,) in most respects resembles the South Down race. The wool is fine and short; the flesh fine and sweet; and the variety is capable of great improvement, by judiciously crossing with Herefordshire rams.

VI.—ROMNEY MARSH.

SPECIFIC CHARACTERS.—The faces are white; legs white and rather long; bones rather large; body round, or barrel-shaped; size good.

PECULIAR ADVANTAGES.—The wool is fine, long, and white, weighing, when killed at two years and a half, about eight pounds per fleece. Flesh excellent and fine grained. The Romney sheep fatten early and kindly, but are calculated only for rich marsh, or pasture grounds, where this breed is very profitable.

This breed of sheep, as the name imports, is reared principally on Romney Marsh, and also on the rich marsh lands of Sussex. It is probably capable of considerable improvement without crossing, by proper care and attention, and by being less exposed during the winter season.

VII.—THE HERDWICK BREED

Occurs on the mountainous tract at the head of the rivers Esk and Dudden, in the county of Cumberland, where they are farmed out to herds, from which circumstance they derive their name.

SPECIFIC CHARACTERS.—Faces speckled with black and white; legs of the same colour, small, fine, and clean.

PECULIAR ADVANTAGES.—Wool short and matted in the fleece, each fleece weighing, upon an average, two pounds, when killed at four years and a half. Constitution very hardy and vigorous, requiring only a little hay during intense winters.

VIII.—THE CHEVIOT SHEEP

Derive their name from the mountainous tract termed the Cheviot Hills, whence they have been introduced into the most northern districts.

SPECIFIC CHARACTERS OF THIS BREED.—Faces and legs chiefly white; body long; eyes lively and prominent; fore-quarter deficient in depth on the breast, which is narrow, as also is the chine; pelts thin; bones fine, clean, and small.

PECULIAR ADVANTAGES.—Wool partly fine, and in part of a coarse quality, each fleece averaging about three pounds, when killed at four years and a half old. A very hardy mountain breed, well calculated for exposed situations, fattening kindly.

IX.—THE DUN-FACED BREED

Is found in the exposed northern districts of this island. The faces of the sheep are of a dun, or tawny colour. The animals are small in size, and have short tails. The wool is variously streaked with black, red, brown, or dun, and partly of a fine texture, weighing about a pound and a half per fleece, when killed at four years and a half. Flesh finely grained, and of excellent flavour. Not so hardy as the preceding sort.

X.—THE SHETLAND BREED

Derives its name from the islands where these sheep are reared. The wool is very fine and soft, fit for the finest manufactures; the fleece weighs, upon an average, from one to three pounds. The Shetland sheep are very hardy, but too wild to be confined.

There are two varieties of this breed: the *first* of which has very coarse wool above, and fine wool below, being supplied with long hairs, termed *fors* and *scudda*, which protect the animals from the intense cold of winter.

The *second* variety has soft, cottony fleeces, and is less hardy than the preceding variety, the wool being short and open.

CLASS II.**HORNED SHEEP.****XI.—THE SHROPSHIRE, OR MORF BREED,**

Is principally confined to the county whence it has its name; and to the neighbouring counties of Stafford and Worcester.

SPECIFIC CHARACTERS.—Horns small; legs and faces dark speckled, or black; wool nearly all fine, and, it is said, superior to Ryeland wool, since the crossing which has taken place in that stock.

XII.—THE EXMOOR BREED

Derives its name from Exmoor, on and in the vicinity of which, in the northern parts of Devonshire, this race is chiefly found.

SPECIFIC CHARACTERS.—Faces and legs white; bone, neck, and head peculiarly delicate.

PECULIAR ADVANTAGES.—Wool fine and long, averaging about four pounds per fleece. Very hardy.

XIII.—THE DORSETSHIRE BREED

Is principally confined to the county of Dorset and the neighbouring districts. The faces are white; legs long,

small, and white; ewes singularly prolific, bringing lambs twice, and at any part of the year. The wool is fine and short, the fleece averaging about three pounds and a half, when killed at three years and a half old. 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 juicy meat of the lowland sheep.

XIV.—THE NORFOLK SHEEP

Is indigenous in the counties of Norfolk and Suffolk, where it is now giving way to the more profitable South Down breed.

The horns are large and spiral; faces black; bodies long, thin, and weak; necks long; legs long, black, or grey.

The wool is short and fine, weighing about two pounds per fleece, at three years and a half, which is the chief quality of this breed, whose flesh is well flavoured and of a fine grain. Kept chiefly for the convenience of folding.

XV.—HEATH, LINTON, SHORT, OR FOREST SHEEP.



Such are the different names given to the same breed of sheep, which is found in the north-western parts of Yorkshire, the north-western counties of England, and thence forward to the Western Highlands of Scotland.

THE SPECIFIC CHARACTERS of this race are, horns like those of the preceding sort; faces and legs black; eyes wild and fierce; carcass short and firm.

Wool long, open, coarse, and shaggy; fleece averaging about three pounds and a half at four years and a half. Constitution hardy, and superior to that of the Cheviot breed; admirably calculated for elevated, heathy, and exposed districts. Good feeders. Flesh excellent.

XVI.—MERINO, OR SPANISH SHEEP.



The horns of this breed are of a middle size, of which the ewes are sometimes destitute; faces white; legs of the same hue, and rather long; shape not very perfect, having a piece of loose skin depending from the neck; bone fine; pelt fine and clear.*

The wool of the Merino sheep is uncommonly fine, and weighs, upon an average, about three pounds and a half per fleece. The best Merino fleeces have a dark brown tinge on their surface, almost amounting to black, which is formed by dust adhering to the greasy, yolky properties of its pile; and the contrast between it and the rich white colour within, as well as the rosy hue of the skin, (which peculiarly denotes high proof,) surprise at first sight.† The Merinos are natives of Spain, and were first introduced into Eng-

* Lord Somerville's "System pursued by the Board of Agriculture."

† Somerville's "Facts and Observations on Sheep," &c. p. 21.

land in the year 1787 ; but it was not until 1792 that any effectual measures were adopted towards improving our native breeds by a Spanish cross. In the last mentioned year, HIS MAJESTY received several rams of the Negretti breed.* but so great was the force of prejudice, that notwithstanding the manufacturers confessed the wool of the Anglo-Spanish cross to be of *prime quality*, yet not one individual would bid a price for it, at all equal to what they paid for good Spanish wool. In progress of time, from the patriotic exertions (upon a small but judicious scale) of Dr. Parry of Bath, and especially of the Right Hon. Lord Somerville (who, at an immense expense and risk, imported a flock of choice Merino sheep), the real value of this breed has very rapidly risen in the public mind : and, from the superior prices which Anglo-Merino wool produces, and the excellent nature of the cloth manufactured therefrom, it is now fully proved by Dr. Parry, that the wool of the fourth cross of this breed is fully equal to that of the original Spanish ram. The following result of the doctor's practice we give in his own words from the " Letters and Papers of the Bath and West of England Society," vol. 10. pp. 83—94.

" I. The wool of the fourth cross of this breed is fully equal in fineness to that of the male parent stock in England. Unless by accident, the wool of no dip, short of the fourth, equals in fineness that of Spain.

" II. By breeding from select Merino-Ryeland rams and ewes of this stock, sheep may be obtained, the fleeces of which are superior both to those of the cross-breed parents, and of course to those of the original progenitors of the pure Merino blood of England.

* In the course of 1809, several hundred Spanish sheep were sent from Spain as a present to his majesty.

“ III. From mixed rams of this breed, sheep may be obtained, having wool, at least, equal in fineness to the best which can be procured from Spain.

“ IV. Wool, from sheep of a proper modification of Merino and Ryeland, will make cloth equal to that from the Spanish wool imported into this country.

“ V. The proportion of fine wool in the fleeces of this cross-breed is equal, if not superior, to that of the best Spanish piles.

“ VI. This wool is more profitable in the manufacture than the best Spanish.

“ VII. The lamb's wool of the Merino breed will make finer cloth than the best of that of the pure Merino breed.

“ VIII. Should long wool, of this degree of fineness, be wanted for shawls, or any manufactures which cannot be perfected with any common coarse long wools, the ram's fleece of the cross-breed (which was numbered 23 in Dr. P.'s specimen of cloth), will prove that this can be effected by allowing the fleece to remain on the animal *unshorn for two years*.

“ IX. Though I have never selected a breeding ram or ewe on account of any other quality than the fineness of the fleece, this stock is already much improved as to the form of its carcass, comparatively with the Merinos originally imported.”

Of all the various English breeds, the Herefordshire or Ryeland has been most successfully crossed with Spanish

blood: and, although a highly respectable gentleman, Mr. Knight, ("Communication to the Board of Agriculture," vol. 3. p. 187) has said, that the produce of the cross is *ugly*, and, as he is informed, subject to the *foot-rot*, yet the very reverse is proved to be the fact, viz. that they are well-formed, and no more liable to that disorder than any purely English breed. Dr. Parry states the fleece of the Anglo Merino sheep to be heavier in proportion to the carcass than that of any other known breed in Europe. The average weight of the fleeces of two-shear ewes is estimated at four pounds and a half, avoirdupois, in an unwashed state: the fleece of a fat wether of the same age will be from five to seven pounds.* The figure at the head of this breed is that of a Merino wether, belonging to Lord Somerville.

WITH respect to the selection of sheep, as an article of *live stock*, the same principle of symmetry of form, and other requisites to the formation of a good breed of black cattle, which have already been specified,† are equally applicable. The breeder, or grazier, should also carefully examine the nature of his land; and having attentively weighed its relative degrees of fertility, and his various sources for supplying food, he may then proceed to purchase that breed, which, after mature consideration, he has reason to believe is best calculated. In this point the introductory view of breeds and varieties, already referred to, will probably afford some guide; but there are some

* "Facts and Observations on British Wool," 4to. 1799, pp. 4, 5.

† Vide Supra, p. 21 to 35.

additional hints, to which we would call his attention. In the first place, therefore, he should take care not to suffer himself to be led into needless expences, in purchasing fashionable breeds, by which his affairs might become involved, and his exertions in other objects be rendered nugatory. Secondly, the difference of the land, whence the sheep are to be purchased, ought to be attentively weighed: for with sheep, as with cattle stock, if any breed be brought from a rich to an inferior soil, it must necessarily decrease in value and condition. Not only, therefore, must sheep be *suited* to the pasture, but they should also be purchased from poorer land than that of the intended proprietor, for on attention to this last point depends their immediate thriving.

Having thus noticed the general objects in selecting sheep, we now proceed to state some *particular* points that will demand the breeder's attention; and as, in all cattle, the *male* has the greatest influence, shall specify those requisites which are essential to a good *ram*.

"The head of a good ram," says Mr. Culley, (on Live Stock, p. 103) "should be fine and small; his nostrils wide and expanded; his eyes prominent, and rather bold and 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* (i. e. 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."

In addition to the symmetry and other requisites above specified, it may be remarked, that, as the fine quality of the wool depends greatly upon the breeder's judgment, the young grazier will find it beneficial to his interest to consult some experienced wool-stapler, or clothier, who, from his occupation, being accustomed to examine wool, is consequently enabled to determine, not only with accuracy, but also with a view to the breeder's real profit. Farther, the pelt, or coat, should be attentively investigated, lest it be *stitchy haired*, in which case the wool will be so materially damaged, in the course of two years, that the injury cannot be recovered for twelve or fourteen years, unless the whole flock be changed.

With respect to the *time*, or proper age, for purchasing sheep intended for breeding, there is a difference of opinion: but the most experienced breeders recommend these animals to be procured, a short time previously to shearing, from the farmer, grazier, or owner's house; because they will then be seen in their natural state, and the *real* depth of the staple may also be easily ascertained, without the

possibility of any fraud or imposition being practised on the buyer by the vender.

Ewes generally breed at the age of fifteen or eighteen months, though many experienced breeders never admit the ram till they are two years old. Much, however, depends, in this respect, on the goodness of the food, as well as on the forward or backward state of the breed; and, from the great profit which these useful animals afford to their keepers, they require no inconsiderable attention to be bestowed upon them.

The *choice* of ewes, therefore, ought to be made with care and discrimination, not only as to the characteristic marks, which ought to be the same as that of the ram, but also with regard to the *breed*; for, with sheep as with other cattle stock, no certain degree of excellence can be attained, unless the *female possess an equal degree of blood with the male*. In particular, a purchaser should see that the animals be *sound*; and, in order to ascertain this point, it will be advisable to examine whether the *teeth* are white, the *gums* red, the *breath* not fetid, the *eyes* lively, the *wool* firm, and the *feet* cool; qualities these which afford a certain criterion of health or disease.

Of equal importance is the proper adaptation of *rams* to the *ewes*: and, in attending to which point, the conduct of the late Duke of Bedford (whose memory every real friend to his country must revere, notwithstanding the recent misplaced aspersions on his character), deserves to be imitated by every attentive breeder. Previously to the drawing-off any ewes for particular rams, it was his constant practice to select every ram, together with the lambs begotten by it in the preceding year, from the rest of the flock, and confine them in separate pens, in order

that he might examine them and their issue, and thus be enabled to make a proper determination.

Ewes bring forth one, two, and sometimes three lambs,* after a gestation of five months, or twenty weeks; hence the sheep-farmer, or breeder, may, in general, by considering whether he has sufficient grass to support the ewes and their progeny in the spring, ascertain the most advantageous period for lambing; or, in the event of a failure of pasturage, whether he has a stock of turnips adequate to their maintenance till there is a sufficient herbage to supply them with food.

The usual time of yeaning is towards the end of March, or early in April; consequently the rams are, according to the general practice, admitted in the commencement of October. But in the county of Dorset, where the ewes are, from a peculiarity in their constitution, capable of bringing lambs twice in the year; and also in the southern and south-western districts, where large quantities of house lamb are raised for the table, it is more profitable to deviate from this plan, and so to admit the ram, that the lambs shall be dropped from four to six weeks, or more, earlier.

* The most prolific sort is the *Teeswater* variety of the Lincolnshire breed, of which Mr. Culley has given the following instances. An ewe belonging to a Mr. Eddison, when two years,

In 1772, brought him four lambs,
 In 1773,five lambs,
 In 1774,two lambs,
 In 1775,five lambs,
 In 1776,two lambs,
 In 1777,two lambs;

and of these the first *nine* lambs were yeaned in *eleven* months.

The strength and beauty of sheep stock also greatly depend on the number of rams allowed to serve the females. While the former are young, fifty or sixty should be the utmost extent; and as they advance in years, the number may be gradually increased: without these precautions, the lambs would not only be deficient in number, but also in point of strength.

Various expedients have been resorted to, in order to make the ewes *blossom* (i. e. to want the ram); among others, is the practice of worrying them with small dogs, kept for that purpose, in consequence of which they become *warmed*, so that they seldom refuse the ram. But it is much better, and certainly a more rational plan, to keep the rams and ewes in different pastures, till the time when they are intended to be brought to the rut; and for about five or six weeks before, let them have somewhat better pasture than they are usually accustomed to, by which expedient they will be disposed to take the ram the sooner. In fact, it is with sheep as with other cattle, the female must be in a certain state desirous of the embraces of the male before the latter will attempt to serve her; and this object can only be attained by increasing the richness of their food a short time before they are required to couple; for in proportion to the excellence or poverty of their food, the bodily vigour of these animals must evidently increase or diminish.

During the period of gestation, ewes require great attention, lest any accident should befall them and occasion them to *slip* their lambs; and, if the latter should take place, it will be proper to separate them instantly from the rest of the flock. It will therefore be necessary to keep them in the same manner as cows while going with calf, viz. upon a moderate, or tolerably good,

sheltered pasture, where no object can disturb them; though, if this should fail, it will be advisable to give them turnips, or similar green food, under the like precautions, till within the last two or three weeks of their yeaning. In the breeding of cattle, indeed, it is a maxim, which ought to be steadily kept in mind, that nothing can be more prejudicial to the females than to fatten them during gestation; and with respect to ewes in particular, this rule should be more carefully observed than with regard to any other animal; for, if they be fed too high while they are going with lamb, they will undergo great difficulty and pain in yeaning; whereas, unless they are put into a little heart before that period arrives, they will not only be deficient in strength at the critical moment, but also be destitute of a sufficient supply of milk for the support of the lamb; and consequently both the dam and her progeny must be greatly weakened, if they do not actually perish from such mismanagement.

As the time of yeaning approaches, the attention and assiduity of the shepherd (if there be one) or of the breeder ought proportionably to increase, as it sometimes becomes necessary to assist nature in cases of difficult parturition; and also, if in the open air, to drive away crows and similar birds of prey, which might otherwise assault the newly-dropped lambs, and pick out their eyes, notwithstanding all the efforts of the dam.

As soon, therefore, as the ewes are expected to begin to yean, they ought, every night, to be folded in a standing littered fold, on one side of which should be a warm cottage hut, provided with a chimney, and with a stove for warming milk, and also with a bed on which the shepherd may lie down. Here he is to sleep during

the lambing season, that he may be ready to watch, assist, and tend any ewes which he observes to be very near lambing, and, if necessary, to give aid to the young animal. Mr. Young, to whom we are indebted for this hint, remarks, that some considerable Norfolk farmers have such huts on four wheels, to draw about with the flock, wherever they may be; but he justly conceives, that it is a far preferable method to have one littered, and well-sheltered, standing fold on a farm of a moderate size, and two or three conveniently placed on a large one, to which the flock may be taken without any distant driving.

Farther, after the lamb has yeaned, it will be necessary to examine, as early as possible, whether it be as strong, as from concurrent circumstances there may be reason to expect; for, in the contrary case, it should be housed with the dam. And, if the ewe also be weak, she should be kept on good grass pasture (as turnips, however useful in other instances, would in this case tend to make them *mortify**) till she has a proper supply of milk for her lamb, which should, in the mean time, suck another ewe.

It has already been intimated, that turnips are of great service in giving a flush of milk to ewes, which are not weakened by difficult parturition; and, as many drop their lambs at a very early period in the year, great care is necessary in supplying them with those useful roots, so as to insure a sufficient quantity. If the land be liable to be poached by the sheep, the best mode is to draw the turnips, and cart them to a dry pasture, where the sheep may be baited with them once or twice in the day, proper

* Marshall's "Rural Economy of Norfolk," vol. ii. p. 137.

attention being bestowed that the animals eat the whole, without committing any waste; a circumstance which, if duly observed, will afford a certain criterion of the quantity necessary for each meal or bait, while the stock of roots will be consumed in the most beneficial and economical manner. On dry lands, indeed, a different practice may with advantage be adopted, by eating the crop on the land, hurdling off a certain quantity for the flock; and, as they consume these pretty clean, by extending the hurdles farther. By this method, no inconsiderable degree of trouble is saved; and, on whatever land these roots are given, provided the soil be dry, great benefit will uniformly result from such practice.

During very wet or stormy weather, or in deep snows, it will be necessary to bait the ewes and their young progeny on hay. With some farmers it is usual to drive them to hay-stacks, where they meet both with shelter and with food; a measure which is by no means consistent with the economy that ought to exist in every department of farming business. By others, again, the hay is given in moveable racks, and a stated portion *per diem* is allowed: "it is, indeed, an excellent method," observes that intelligent agriculturist, Mr. Young, "to allow them in their racks a small quantity of hay daily, while on turnips, let the weather be good or bad; but this is not absolutely necessary." He also remarks, that, in some parts of the kingdom, the most experienced farmers give their ewes and lambs bran and oats, or oil-cakes, in troughs, while these animals are feeding on turnips; but the expense attendant on this practice can only be repaid by a good breed.

By the course of feeding here detailed, the sheep may be successfully supported till the month of March, after which time no intelligent breeder will allow any turnips to

be seen on the ground. In fact, by the period last mentioned, the stock of turnips is generally consumed; so that every attention should be paid to have a proper supply of spring food. Among the many expedients resorted to for this purpose, may be mentioned the turning of sheep into a spot of rye sown for that purpose, or into crops of wheat, in order to feed them off; an expensive practice which, however, cannot be adopted on farms that are appropriated *solely* to the rearing and grazing of cattle. Other resources are, the letting the animals run over the clover and pastures of the farm; hence the crops of hay, and pastures for large cattle, receive material injury. Farther: others, with a view to avoid these extravagant practices, keep the turnips so that their shoots may become an object of sheep-food; and also have an adequate spot of land, under ray grass and clover, ready to take the ewes and lambs from turnips, before they are turned in upon the pastures. But, notwithstanding the various advantages which the last-mentioned expedient undoubtedly possesses over the former modes, as the roots become sticky and hard after the tops have sprouted, and (to omit many other inconveniences), as it requires a great extent of ground to keep 100 lambs and ewes in this manner, *turnip cabbages*, the *ruta бага*, *green borecole*, (which, being impenetrable to frost, will shoot during the winter, and may be fed off several times), and especially *burnet*; all afford singularly useful crops for spring feed.

Infinitely preferable to any of these useful articles of spring feed for ewes and lambs is *rouen*, or the after-grass, kept on dry meadows and pastures after the hay-harvest is concluded. Although a field of *rouen* presents an unpromising aspect at a distance, in colour not unlike very bad hay, yet, when this covering is removed, a fine green herbage, from five to six inches in height, will appear; the

whole of which is eaten with avidity by the ewes and their young progeny, who are thus supported till they are turned into the pasture.

With regard to the best time for *weaning* lambs, much depends upon the period or season when they were yeaned. When a lamb is to be kept for breed in a good common pasture, it is the practice, in some counties, to wean it at the end of about four months, in order that it may become strong, and that the ewe may acquire strength, and go quickly to *blossom*. In others, which are more mountainous and poor, the lambs are weaned a month earlier. But, whatever influence local customs may have in this respect, this business should be performed before the expiration of July; and, as it is of essential importance to their future growth, and consequently to the breeder's profit, that due provision be previously made, it will be proper to remove the lambs to a distance from the ewes, to such fresh food as may be most convenient. In the opinion of Mr. Young, clover, while in blossom, is the most forcing food; sainfoin *rouen* may also be successfully employed for the same purpose; but if the farmer, or breeder, possesses neither of these succulent vegetables, he ought, at least, to have reserved a sweet bite of fresh pasture-grass. On weaning the young animals, their dams may be milked two or three times, in order to relieve their udders, which would otherwise become painful.

Various ages are mentioned as being most proper for gelding those lambs which are not intended to be raised as rams for breeding; the sooner, therefore, this operation is performed, it is the better for the animal, which is more able to support it when young, and running with the dam, and when there is less danger to be apprehended, lest any inflammation should ensue. The time best calculated for

this purpose, in the opinion of the best farmers and breeders, is within the first fortnight, unless the lambs are unusually weak, in which case it will be advisable to defer castration for two or three weeks, or such longer term as may be expedient, till they acquire sufficient strength.

The *shearing* of sheep, and the profit thence derived from the wool, form a very considerable article of rural economy. The most proper time for this purpose must be regulated according to the temperature of the weather, in the different parts of this island. If the weather be hot, the month of June may be fixed for shearing, or clipping these animals, though some breeders defer it till the middle of July, under the idea that an additional half pound of wool in every fleece may be obtained, in consequence of the increased perspiration of the sheep. An early shearing, however, is preferable where the weather and other circumstances will admit of the operation being performed; because the new wool will not only gain time to *get a-head*, but the animal will also be secured from the attacks of the fly, to the depredations of which it becomes liable by delaying the operation.

Previously, however, to shearing, the sheep ought to be washed, in order to remove the dust and other filth which they may have contracted: this is usually performed by men standing in the water, who, not unfrequently, take serious colds, or are otherwise indisposed in consequence; while their employer is put to a useless expense, in order to supply them either with a medicated liquor, known in some counties by the name of *lamb's wool*, or with ardent spirits. To prevent these inconveniences, as well as the abuses resulting from the careless or negligent manner in which the washers do their work, Mr. Young proposes to "rail off a portion of the water," (either of a running stream or of a

pond), "for the sheep to walk into, by a sloped mouth at one end, and to walk out by another at the other end, with a depth sufficient for them at one part to swim; pave the whole; the breadth need not be more than six or seven feet; at one spot, let in on each side of this passage, where the depth is just sufficient for the water to flow over the sheep's back, a cask, either fixed or loaded, for a man to stand in dry; the sheep being in the water between them, they swim through the deep part, and walk out at the other mouth, where there is a clean pen, or a very clean dry pasture," or rick-yard, "to receive them for a few days, until they are thoroughly dry, and fit for the shearers, the lambs being first separated from the other sheep, and confined in distinct pens. Of course," adds that enlightened agriculturist, "there is a bridge-railway to the tubs, and a pen at the first mouth of the water, whence the sheep are turned into it, where they may be soaking a few minutes before being driven to the washers."* Previous to wash-

* As the comparison of different practices, by eminent breeders, greatly tends to improve the method which any individual may be in the habit of following, the subsequent notes, relative to the practice of some very eminent graziers on the Continent, we trust, will not be deemed irrelevant to the subject above discussed. In Sweden, the business of sheep-shearing commences early in July: some breeders there simply wash their sheep in running water, while others bestow more attention upon that operation. They put the animals in shallow tubs, where they wash them with warm water and urine, and afterwards cleanse them with pure water. After they have been thus washed, the sheep are allowed to run in a meadow for two or three days, or even longer, if the weather will permit; in order that the fleece may imbibe a new yolk, which imparts a greater degree of softness and elasticity to the wool. In Silesia, the latitude of which corresponds with that of many of our finest grazing districts, Count Magnis—whose very laudable exertions in improving the breeding and management of sheep will be more particularly noticed in a subsequent page—follows the method usually practised in that province, in washing wool; and which simply consists in making the sheep cross a running stream, after obliging them to plunge into the water from a pretty high bridge. The method chiefly pursued in the fine country of Saxony, consists, first, in making the sheep cross a brook or river; on the second day, in the

ing, the following cordial has been recommended to be given to the sheep, by Mr. Varlo, an eminent grazier. He directs one quart of Barbadoes tar, and one quart of salt, to be mixed with every quart of ale; of which drink half a pint is to be given to each animal when it is going into the water. Mr. Varlo states, that this medicine will effectually prevent any disorders, destroy lice, ticks, or other vermin infecting sheep, and will also add to the growth of the wool.

The *clipping* or *shearing* of sheep is performed in two ways, and usually in a barn, or similar shady place. The first and most ancient, or common way, is done longitudinally: this mode is attended with considerable difficulty, and is seldom well executed; hence Mr. Young thinks it probable, that one or two ounces, upon an average, are left on each sheep, which greatly impedes the growth of the next year's wool. The second, and improved method, consists in cutting *circularly* round the body of the animal, the beauty of which is, in consequence of this, believed to be increased, while the work is more uniformly and closely

morning, they are again made to pass through the water, in which they are dipped, in order that the fleece may be uniformly penetrated; after which they are stroked or pressed down with the hand, beginning at the head, and thence proceeding to the extremities of their bodies. They are also led once, in the afternoon, across the stream; the fleeces are allowed two days to become dry, and on the third day they are shorn.

A shearer dispatches twenty-five sheep in one day. When an animal is wounded, the part is anointed with its excrements, or with a mixture of linseed oil or resin. The shearing ceases about three o'clock in the afternoon, that the beasts may have time to feed in the meadows, whither they are gently driven after they have undergone the operation. After the shearing, some graziers fold their sheep for two or three weeks, sending them proper rations of food.—For these interesting facts we are indebted to M. Lastery's very valuable "*Histoire de l'Introduction des Moutons à Laine fine d'Espagne dans les divers Etats de l'Europe, et au Cap de Bonne Esperance,*" &c. 8vo. 1802.

executed. This mode has been introduced from Lincolnshire into Bedfordshire, by the late Duke of Bedford; by Mr. Coke, of Holkham, into Norfolk; and by the Earl of Egremont into the county of Sussex, whence its utility and convenience will probably be a means of dispersing this practice into other grazing counties.

During the whole process of washing, as well as of shearing sheep, it will be advisable for the farmer himself to superintend those operations; and especially to see that the clipper do not wound or prick the animal with the edge or point of his shears; otherwise the flies, abounding in the sultry heats of midsummer, will instantly attack the sheep, and sting them to very madness. The same precautions are applicable to the shearing of lambs, which are usually washed and clipped about five or six weeks after the rest of the flock, though such practice is disapproved by some breeders, who accordingly shear the whole at the same time. And, lastly, it will be requisite that he see the wool carefully clipped off, and properly wound up, lest any impure particles or extraneous substances be mingled with the wool, the sale of which might otherwise be injured.

In the preceding details, we have spoken of one annual shearing; but experiments have been made by some enterprising breeders, tending to shew that, in certain cases, long-woolled sheep may be shorn *twice*, and even *three times* in the year, without the animal receiving any material injury. And Mr. Ellman, a spirited farmer of Glynd, in Sussex, clips off the coarsest wool on the thighs of his South-down flock (the first of that breed in this island), and docks them about four weeks before the usual time of washing and shearing. The wool, thus severed, he sells, as locks, for 3½d. per pound, each sheep yielding, upon an

average, four ounces. He is said to find this method very beneficial, as the animals are kept clean and cool during hot weather; and from the success with which this method was practised, it has been adopted in other counties with different breeds of sheep.

A more singular mode was recently tried on the Merino sheep at the French national farm, at Rambouillet, the result of which is stated to be, that the fleece of sheep improves greatly by being suffered to grow for several years; and that the fleeces of some sheep, which were shorn in the summer of 1804, for the first time for *three* years, were equal in point of staple to those of *three* others which were annually shorn, and produced a larger sum. It is possible, Lord Somerville remarks ("Facts and Observations on Wool," &c. p. 42), that this property in the Merino fleece to grow beyond the period usual in our breed of sheep, may be productive of some new manufacture, requiring great length, and fine quality of pile: but the hazard of the *Blow-fly*, and the chance of losing in hedges and brakes any part of a fleece after it is once fit for a manufacture, will not allow such a practice to become general; admitting even that the sheep suffer nothing in their proof during the summer months, from the weight of the fleece (which in a large scale of business is improbable), and that the wool should be found to pay as well for growing to this length, as it would when shorn in common course.

We state these facts for the consideration of the philosophic breeder; though, with regard to the last experiment, we confess ourselves at a loss to reconcile the idea of the very great degree of heat which the French sheep must have felt with such a weight of wool; especially, as it is the opinion of all well-informed breeders, that an excess of heat is as hurtful to these sheep as excess of cold.

After sheep have been clipped, it is usual to mark them with ochre, tar, raddle, or other colouring matter; but, as it sometimes becomes difficult to wash the stains of these substances out of the wool, another composition was suggested by the late Dr. Lewis. It is prepared by mixing finely-pulverized charcoal, or lamp-black (which is better, where it can be procured), with such a quantity of tallow, over a moderate fire, as will produce a black colour, and a proper consistence; and, with the view of rendering this preparation more durable, Dr. L. states, that one-fourth, sixth, or eighth part of tar may be incorporated with the tallow; and that wool, which has been marked with such mixture, may be easily cleansed therefrom, by washing in strong soap suds.

The following method of *salving* sheep, after they have been shorn, is practised by Mr. Curran, a respectable grazier:—He mixes together one pint of tar and four pounds of butter, which quantity is sufficient for twelve sheep: and he is of opinion, from several years' experience, that the *quality* of the wool is not only much improved, but that the *quantity* also is increased; besides which, the flock is in better condition than formerly. Mr. C. has also found it beneficial, both for the quantity and quality of the fleece, to rub the skin of the animal over with oil (*not train oil*) mixed with warm water. One pennyworth of oil is enough for a sheep.

In cattle farms, in general, it is of great importance to dispose, at certain times, of such beasts as either become unprofitable, or are sufficiently fat for sale; and, with regard to sheep in particular, it is highly necessary to pursue the same management, and to replace old ewes, by an equal number of the best and most vigorous female lambs; in order that the value of the flock may not be diminished.

In the southern counties of this island, the severing of sheep usually takes place about six, eight, or ten weeks after the shearing is finished, or about the middle of August. In making this selection, great care should be taken to choose those only which give indications of their being of the true breed, (whatever that may be); and, according to their comparative strength or weakness, to regulate their pastures. Hence it will be proper to place those animals which are designed for feeding or fattening by themselves; the ewes by themselves; the *wedder* or *wether-hogs*, (i. e. males, whether castrated or not, that are of one year's growth), and *theaves*, or females, that are two years old, by themselves; and the older wethers or rams by themselves; and, lastly, the lambs by themselves; otherwise the strong animals will injure such as are weak, and prevent them from taking that food which would be most beneficial for them.

When a farm is thus stocked with a proper assortment of sheep, it will be necessary for the owner to inspect them often, at least twice in the year, particularly in the winter; and, if the severity of the weather or season has proved fatal to any, he should replace them with others from sound flocks, and as nearly of the same size, quality, and property, of his own stock, as the difference of circumstances will admit. At such annual, or half-yearly musters, it will also be proper to dispose of those animals which do not thrive upon their allotted grounds; but, independently of these examinations, the shepherd ought constantly to continue with this charge, as they are liable to various maladies, which, if not speedily attended to, will carry them off in a few minutes.

Few agriculturists or breeders have, perhaps, all circumstances being considered, carried to a greater extent

the efforts made towards the successful feeding and fattening of sheep than the enlightened and public-spirited Silesian agriculturist, Count de Magnis; who, by pursuing a rational system of practice, has succeeded in annually raising 2500 quintals (250,000 pounds weight) of trefoil, together with a proportionate quantity of lucern, potatoes, &c. for the winter keep of his sheep, exclusive of the fodder necessary for a numerous herd of cows, which he keeps throughout the year in a stable, contrary to the custom of the Silesian farmers.* He has also effected, on his own lands, what is certainly worthy of imitation by all who are desirous of bringing their modes of cultivation to perfection, and what appears to be practicable on every soil—the almost total banishment of fallows. By which means he has not only procured an abundant supply of food for his numerous herds and flocks, but has likewise very considerably increased the amount of his income.

Those lands which were formerly suffered to lie fallow, are, at present, brought to yield almost the whole of what they are capable of producing. Part of these lands are sown with lucern or trefoil, which yields a sufficient supply of fodder, not only for the summer keep of his cows, but also for the winter feed of his sheep. One-third is planted with potatoes for the winter keep of these last-mentioned animals.

Such soils as are not capable of producing grain, from whatever cause it may be, are substituted for fallows, and serve as pasturage for sheep, after being sown with white or Dutch clover, saintfoin, lucern, tall oat-grass, meadow soft grass, upland burnet, and the common burnet saxifrage. These various plants are mixed together on the

* Lasteyrie's "*Histoire de l'Introduction des Moutons à Laine fine d'Espagne dans les divers états de l'Europe,*" &c. p. 197.

same soil, and supply the sheep with pasturage for six or seven years successively. A fresh portion of these lands is annually broken up and cleared, and afterwards planted with potatoes.

The following is the rotation of crops at present taken from the lands which were suffered to lie fallow, previous to the method introduced by Count de Magnis.

First year, Oats.

Second year, Potatoes.

Third year, Oats or barley, with which are sown the seeds of the artificial grasses, or green crops, above mentioned.

Fourth year, Artificial meadows, which are twice mown.

Fifth year, Artificial meadows, on which sheep are depastured for one or more years, according to circumstances.

By this method of culture an abundant supply of straw, potatoes, and other articles of fodder is obtained, stores of which are collected for winter keep.

The apportionment of food is so arranged, that every animal is supplied, however severe or long the winter may prove. Immediately after the harvest, the Count forms an estimate of the quantities of fodder he has acquired; and, in consequence of such estimates, he fixes the allowance each class of animals is to have, as well as what part is to be kept by way of reserve.

There is another trait in the Count's management, which is peculiarly worthy of notice. In order that the distribution of food may be performed with regularity, as well as with ease and exactness, he fixes up in each sheep-house tables, in which are specified the class of animals to be fed, the hour at which their food is to be given them,—together with the nature and quality of the feed they are to receive,—and other particulars, of which the two subjoined tables will convey a more accurate idea than could be produced by mere description.

Table of Allowances for 125 Lambs.

<i>To 125 male Lambs are to be given,</i>		
1st. At 6 o'clock in the morning	{ 2 Scheffels of Dutch clover 2 Do. of cut straw }	} weighing 80lb.
2d. At 10 o'clock in the forenoon	The same allowance	80
3d. At 1 o'clock in the afternoon	Hay uncut	62
4th. At 4 o'clock	{ 2 Scheffels of cut straw $\frac{3}{4}$ of a scheffel of potatoes }	} 40 120
5th. At 6 o'clock	Chaff	92
Which makes a daily allowance of 3 $\frac{4}{6}$ ths lbs. per head.		

Table of Allowances for 100 Ewes.

<i>To 100 Ewes are to be given,</i>		
1st. At 6 o'clock in the morning	{ 1 scheffel, 9 metz. Dutch clover 2 scheffels, 12 metz. cut straw }	} weighing 69lb.
2d. At 10 o'clock in the forenoon	The same allowance	69
3d. At 1 o'clock in the afternoon	White, or Dutch clover	100
4th. At 4 o'clock	{ 2 scheffels, 12 metz. cut straw 10 metzens of potatoes }	} 144
5th. At 6 o'clock	Chaff	75
Which makes a daily allowance of $4\frac{1}{2}$ lbs. per head.		

The allowance to female lambs is fixed at three pounds and three quarters per head; that of rams and castrated sheep at five pounds and a half. The Count de Magnis gives his flocks a sufficient supply of keep, as the quantity apportioned to each animal will evince; and he is annually endeavouring to increase these allowances, by multiplying the number of artificial meadows on his estate. He is justly of opinion, that the quantity of wool depends entirely on the quantity of food.

He never feeds his flocks with corn, having found that grain, though nourishing and wholesome, is by far too expensive; and that the vegetables above enumerated, particularly potatoes, may be advantageously substituted for it. He has indeed computed, that potatoes produce exactly the same effects as oats, of which they save three-fourths of the expense when substituted for that kind of grain.

By pursuing the excellent method here detailed, the Count de Magnis' flocks are constantly kept in a high, thriving condition, and appear in the pastures, after a long winter, as healthy and well fed as they were when they quitted the fields, in order to be housed during that inclement season.

But, whatever management the farmer may adopt, he ought on no account to withhold salt from his live stock, especially from sheep; for, not only does the continual use of that article contribute to the digestion of succulent vegetables, and of course preserve the animals in constant health, but it is also said to improve both the quantity and the quality of the wool. Hence, as it augments the nourishment of the food eaten in proportion to the quantity of saline matter, it ought to be particularly used in those moist situations, the produce of which is liable to *rot* sheep,

of which malady it is both a preventive and a cure. Rock-salt is undoubtedly preferable: but, where this cannot be conveniently procured, it will be advisable to dissolve common salt in water, and, after mixing it with fine pure clay, or with pulverized and sifted chalk, form the whole into masses or lumps, which may be placed under shelter, so that the sheep may lick it at pleasure.

But the importance of salt in preserving the health of sheep is not generally known, or perceived by many breeders even of this island, who do not give it in any form. The same prejudice exists in Prussia and Holland, where no salt is allowed to these animals, which, in so moist a country as that of Holland, is rather singular. As far, however, as the use of salt, considered as a preventive of the rot, is concerned, the not giving it is compensated by the numerous alder-trees that grow in Holland, and which, we are informed by M. Twent, an experienced Dutch breeder, that sheep eat with uncommon avidity in wet weather, and are thus preserved from the *rot*, even when they are suffered to pasture in marshy places.

On the contrary, at Rambouillet, in Silesia, Saxony, Sweden and Spain, salt is considered as a most important article, and the use of it is most strongly recommended. In Sweden they give salt, particularly in rainy or damp weather, and frequently add to it wormwood, or some other bitter vegetables, juniper seeds or berries, and even pitch. All these articles are reduced to powder, and, after being diluted with water, are carried to the stable or sheep-house, and put into the trunks of trees, which are excavated expressly for this purpose. At the circumference of the trunk are fastened three or four pieces of wood, which rise vertically about a foot and a half above the edges of the trunk, in order to keep the sheep from leaping over it, as well as

to spread out or to salt their food. The preparation just stated is considered as an excellent preventive of several distempers, particularly the dropsy, to which the Swedish sheep are very liable.

Before we close the present discussion, respecting the management of sheep, it may not be improper to advert to one or two practices materially connected with them. The first is that of *docking*, or cutting of tails, which prevails not only in this country, but likewise in Spain, Saxony, and, generally speaking, in every district where the inhabitants pay much regard to the improvement of wool-bearing animals. The tails are usually cut when the lambs are three or four months old; as, if the operation were deferred beyond that time, it could not be performed with safety to the animal. But this practice is objected to by some intelligent breeders in England, on the ground that it renders sheep unable to defend themselves against the attacks of flies during hot seasons. By others, however, this practice is strongly recommended, because it tends to preserve the health of the animals, by keeping them more clean from the ordure, which they, in a great measure, deposit on the fleece. The other practice above alluded to is, that of *extirpating the horns of sheep*; which has hitherto, we believe, been confined to the sheep-walks of Spain, and to the sheep-farm at Rambouillet, in the south of France. The reasons assigned for it, and the manner in which this operation is performed, are thus detailed by M. Lasteyrie.*

“The horns, given by nature to the ram for self-defence, become not only useless, but also inconvenient and troublesome to him when domesticated; they prevent him from pushing his head between the interstices of the rack, in order to cull the straw, of which he eats only the outer skin;

* “*Histoire de l'Introduction,*” &c. p. 236.”

and to select the ears and tender blades of grass that are mingled with it. They very frequently wound ewes when passing through gates; and not seldom do they prove fatal to the rams themselves when these begin fighting. There are two ways of cutting off the horns, viz. by means of a saw, or with a chisel. In the former case, a very fine hand-saw is made use of; but the English hand-saws are most convenient for this operation. One man takes firm hold of the ram's head, a second performs the amputation, which requires only a very short space of time, if the operator is dexterous in the use of the saw.

“Amputation with the chisel, of which the Spaniards avail themselves, is by no means so simple. They dig a ditch or trench, of the length and breadth of a sheep, and five or six inches deep; at one end of this a second ditch is dug, but not so broad as the first, with which it forms a cross. In this last ditch, which is very shallow, a plank is placed, that serves as a support for the head of the ram, which is thrown on his back into the trench that forms the cross. A man then lays himself flat on his belly over the ram, and with one hand forcibly presses the animal's head against the plank, while, with the other, he grasps a long and large chisel, of four or five pounds weight; this he fixes successively upon the horns, and on it another man strikes one or two hard blows with a wooden mallet, which very neatly takes off that part of the horn which is intended to be separated. The preparation required by this method renders the use of the saw far preferable to it. This operation is usually performed at the end of the first year.” And M. Lasteyrie remarks, that, “when the horns shoot forth again, it is not uncommon for them to touch some parts of the head, which they gall considerably, and into which they will sometimes enter deeply, unless they undergo a second amputation.”

In fine, throughout the whole system of sheep husbandry, the greatest attention is necessary on the part of the shepherd, regularly and frequently to inspect the animals committed to his charge;* and, in order to facilitate this object, it has been recommended to have a moveable sheep-house in which to reside; thus, being always on the spot, he will be enabled to assist the sick or weaker animals, and will prevent many of those accidents which must otherwise unavoidably happen.

Sheep, Mr. Culley observes, generally renew their first two teeth from 14 to 16 months old, and every following year, about the same time, until they become *three-shear*, that is, turn three years old, when they become full-mouthed. For, although they have eight teeth in the under-jaw before, Mr. C. believes they only renew the six inside teeth: but, with regard to this point, there is a difference of opinion among experienced shepherds, some of whom think sheep cast only 6, while others conceive that they renew the whole 8 fore-teeth.

HOUSE LAMBS.

In the course of the preceding remarks on Sheep-Husbandry, the treatment of lambs intended to be kept for stock, has been chiefly regarded; but as the price given in the winter, in the metropolis, and in other places where

* In Saxony the shepherds have no fixed wages, but are allowed a profit on the produce of the flock. From the adoption of this arrangement, the sheepmasters derive great advantage, as the shepherds have no inducement to deceive them, and are themselves interested in taking due care of the flock." *Lasteyrie*, p. 176.—How far this practice is feasible in England, it would be rash in us to assert; but, as the hint seems worthy the attention of trial, we leave it to the consideration of the intelligent reader.

there is a demand for young lambs, is often very considerable, we shall, at present, confine our attention to the rearing of those animals in the house, where they are denominated *house-lambs*.

In this branch of rural economy, two circumstances are worthy of notice: 1. To put the rams and ewes together at such a time that the lambs may fall at the proper season; an object which may be easily effected by any skilful shepherd: and, 2. That appropriate places be provided for their reception; where the suckling of house lambs is intended to be regularly followed, it will be necessary to erect a house of such proportions as the probable extent of the business may require, and to divide the building into stalls, in order that each lamb may be more conveniently suckled and confined. Care should also be taken not to crowd too many into one house at the same time, as the increased degree of heat, thus occasioned, will render the place unwholesome.

The breed of ewes, best calculated for producing house-lambs, is the early Devonshire sort, particularly those whose lambs die *fair*, in the language of the flesh-market, i. e. whose flesh is of a delicately white colour: and, from prolific variety, the demands of the luxurious in the metropolis are supplied. The dams in that county are fed with hay, oil-cake, corn, cabbage, or any other green food afforded by the season, which is given in an inclosure. The last are shut up in small dark cells or calms, from which the light is excluded, excepting at the intervals when the shepherd suckles them upon the ewes.

Where the system of suckling is carried on to a great extent, it will be advisable to mark the lambs, in order to

ascertain which has been longest sucking on the *bastard ewe*, (i. e. such as suckle strange lambs, or have lost their own); as such lambs ought to *suck a-head*, or be permitted to take the first milk.

As the ewe's milk is the chief support of the young lambs, (though, in the intervals of suckling, some wheat straw may be given them in racks, or wheat or white peas in troughs, together with a piece of calcined chalk for them to lick, and thus preserve them in health); especial care must be taken to supply her with turnips; or, in case these roots cannot be procured, beside turning her into a good warm pasture, she should be fed with brewer's grains, to which may be added a little hay, oats, or bran; but, as the last-mentioned articles are greatly inferior to turnips, it becomes an object of importance to have a supply of those useful roots.

The ewes ought to be conducted to the lambs three or four times in the day, at nearly equidistant periods; and if any one have a more than ordinary flow of milk, she may be held by the head, while another lamb, which has a less quantity, draws the udder. During the whole of the treatment, the strictest attention ought to be paid to *cleanliness*; to promote which the pens or stalls should be well littered with fresh straw; and, by this simple expedient, the animals will, *if kept free from all disturbance*, speedily fatten, their flesh being exceedingly white and delicate. Some estimate may be formed of the profit arising from rearing house-lambs, from the prices given *per quarter* in the London markets. These vary from ten to fifteen or twenty shillings, according to the demand, so that each lamb sells at from two to four pounds, though the prices afterwards gradually de-

cline, till the ensuing spring affords an abundant supply for the table.

The Middlesex farmers do not at present, we are informed,* rear half so many house-lambs as they did about forty years ago. In Surrey they are likewise falling off. The system of suckling, or rearing house-lambs, is removing to a greater distance from the metropolis, whither many fat lambs are now sent alive, in light four-wheeled covered carriages.

* Middleton's Report on the Agriculture of Middlesex.

CHAP III.

SWINE.

AMONG the various articles of live stock, few are more profitable to the breeder than *swine*, while the number kept on a farm is proportioned to the quantity of offal on the premises: especially as the attendance they require is, when compared with that of others, very trifling; and the benefit arising from their dung more than counterbalances the expense of such attendance.

The characteristic marks of a good hog are, a moderate length, as to carcass in general; the head and cheek being plump and full, and the neck thick and short; bone fine, quarters full; the carcass thick and full; his bristly hide fine and thin; the symmetry or proportion of the whole well adapted to the respective breed of varieties; and, above all, a *kindly* disposition to fatten early.

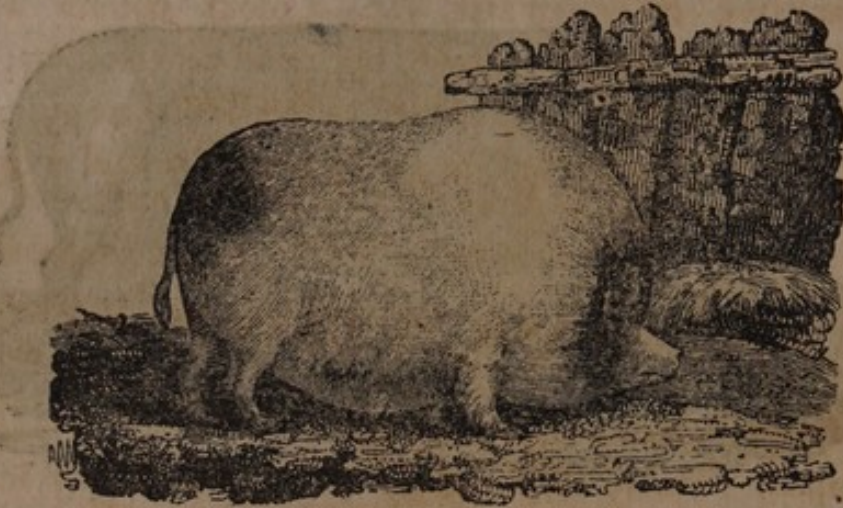
On account of the numerous sorts and varieties of these animals, formed in almost every county, (whose inhabitants generally boast that their own peculiar breed is the very best that can possibly be reared), it is scarcely practicable to ascertain which is the original or parent breed. We shall therefore present to the reader's notice, some particulars concerning those *only* which are of most *frequent occurrence*, or are held in the *highest estimation*, and then offer a few remarks on the general management of swine.

I.—BERKSHIRE BREED.



SPECIFIC CHARACTERS, &c.—Colour reddish, with brown or black spots; sides very broad; short legs; ears large, and pendant over the eyes; body thick, close, and well made. Kindly disposed to fatten, and attaining a large size, but can be kept only where a large and constant supply of food can be procured, otherwise they will dwindle away, and yield no profit. Flesh fine.—This breed is chiefly fattened at the distilleries; feeds to a great weight, and is good either for pork or bacon: but it is particularly excellent as a cross for heavy, slow-feeding sorts. The animals from which the above figures were drawn, were bred by Sir William Curtis, and exhibited at Lord Somerville's Cattle Show in 1807; where they attracted general admiration, for their lively activity and excellent condition.

II.—CHINESE BREED.



SPECIFIC CHARACTERS, &c.—Colour in general black, though often white, tawny or reddish, and brown; size small; neck thick; legs short; body thick, close, and well made. One of the most profitable sorts in this island; flesh delicate; fatten kindly on very indifferent food; but very mischievous if not well ringed.

III.—GLOUCESTER.

SPECIFIC CHARACTERS, &c.—Colour white; size large; legs long, having two wattles or dugs pendant from the throat; carcass long and thin; skin thinner than that of the Berkshire sort; ill formed. A very unprofitable sort; found chiefly in Gloucestershire, Shropshire, and West Devon; supposed to have formerly been the only breed in Britain. Do not fatten so well or so kindly as the Berkshire breed; of late years, however, this breed has been improved in all its points.

IV.—HAMPSHIRE.

SPECIFIC CHARACTERS, &c.—Colour chiefly white, though very often dark spotted; neck and carcass long; ears pointed; body not so well formed as the Berkshire pigs; size large. Fatten kindly, and to a very great size and weight.

V.—HIGHLAND, OR IRISH BREED.

SPECIFIC CHARACTERS, &c.—Size small; bristles erect; ill shaped. Thrive very badly; prevailing chiefly in the Highlands.

VI.—NORTHAMPTON BREED.

SPECIFIC CHARACTERS, &c.—Colour white; legs very short; ears enormously large, often sweeping the ground; size large. Fatten to a great size, but not very kindly; reared chiefly in the county of Northampton.

The SHROPSHIRE BREED appears to be a variety of the Northampton race, to whose characteristics it bears a great resemblance. The Shropshire swine fatten to a large size, but are not so kindly disposed as the Berkshire.

VII.—THE RUDGWICK BREED

Is a peculiar sort of swine, reared at a village of the same name, on the confines of Surrey and Sussex. These swine are very valuable, as they fatten very kindly, and to a vast

size, weighing, at two years, twice or thrice the weight of other swine at that age. As large breeds pay the farmer best in many cases, this sort deserves to be attended to.

VIII.—SWING-TAILED BREED.

The colour of this breed is various; its size is small, but well proportioned. The swing-tailed hogs are hardy, and fatten to a great weight, according to their size.

IX.—LARGE SPOTTED WOBURN BREED.



This is a new variety, introduced by the late Duke of Bedford: its size is large, and colour various. These swine are well formed, very prolific, hardy, kindly disposed to fatten, attaining nearly twice the size and weight of other hogs within the same given period of time. The animal whence our figure was drawn was exhibited at Lord Somerville's cattle-show, in March, 1806.

SOME farmers prefer mixed breeds, as being more beneficial than either of the large or small perfect breeds already described. Where this is the case, the Berkshire with a cross of the Chinese has been found a very profitable sort; being capable of feeding to a considerable weight, with a moderate proportion of food, and in a short time.

Swine are capable of propagation at eight or nine months; but the boar should be at least twelve months before he is admitted to the sow, which will farrow a stronger and better litter if she be kept to the same age. The period of gestation is from seventeen to twenty weeks; when from five to ten, or more pigs, are produced: one boar should not be allowed to serve more than ten sows: and those sows are reckoned the best for breeding strong pigs which have about ten or twelve paps.

Where swine are kept solely for the purpose of *breeding*, it is necessary to pay the same attention to the principle of *selection* as in other articles of live stock. Hence, whatever sort may be required, the boar and sow should respectively be chosen with as perfect a symmetry and other requisites as are practicable; and also be as well kept, in order to produce the necessary stimulus to coition: and, having attained this object, the stock should be constantly raised from such animals. But, as with other cattle, care must be taken that sows, when expected to take the boar, be not kept too fat; experience having shewn that, if they be in very high order, they will not produce an abundant litter of pigs.

Farther, as sows will produce two litters in the year, the breeder will find it beneficial so to arrange each time of farrowing, that it may take place about the latter end of

March or early in April, and towards the beginning or end of August: thus he will be enabled to rear them with less cost, and certainly with less probability of losing the pigs from cold weather, than if they were produced late in autumn: and, while the sows are in pig, they will require to be kept on nutritious food, in order that they may afford the pigs a better nourishment. During the time of going with pig, the sows should be lodged separately, lest their bellies be hurt by others lying upon them.

They should also be kept well littered and clean; but at pigging should not be allowed too much, as they are apt to overlay their pigs in it for the first week. At the end of a week or ten days after pigging, they may be let out of their sties into their yard for three or four hours during the middle of the day, in order to stretch their legs, which is far preferable to total confinement.

It sometimes happens, at the first farrowing, that young sows will eat their progeny; to prevent which, they should not only be narrowly watched as the period of gestation is expiring, but also be moderately fed, two or three days before the expected time of farrowing. Where, however, this precaution has been omitted, it has been recommended to wash the backs of newly-farrowed pigs with a sponge, dipped in a lukewarm infusion of aloes and water, which will prevent her from destroying them. Another circumstance worthy of notice, where there are several sows farrowing at the same time, is to confine them in separate pens or sties, otherwise they will mutually destroy their offspring; and, as these animals are, at such time, extremely mischievous, let them be supplied with plenty of water, which expedient is said to prevent them from committing any injury.

The best time for killing *sucking-pigs*, for the market, is at the end of three weeks; by which time the others, intended to be raised, will be able to follow the sow, and then the males may be castrated; the spaying of females may be deferred for another week.

When it is proposed to wean pigs (the proper age for which purpose is two months, having castrated such as are not reserved for breeding at six weeks), they should, Mr. Young remarks, be kept in sties, having a small yard, wherein they may run; both being kept perfectly clean and well littered. Their food must be good, and given as plentifully as they will eat. Boiled potatoes or carrots for a fortnight, and then raw ones, will prove good food; with a bait every day, for a month, of oats, and afterwards pea, or bean, or buck-wheat meal, unless there is a dairy; in which case, a mess of milk or whey may be substituted. Such, in his opinion, must be the management, till the clover field is ready for them, which may be in the beginning of May; and, if the pigs are three months old, they will thrive well on that food. During the weaning, especial care ought to be taken in supplying them with abundance of clean straw, and to keep the pigs in as clean a state as possible, so that they may always have fine sleek coats; a circumstance this of such consequence, that the want of it can never be compensated by the most plentiful supply of food.

In the management of swine, of whatever breed or variety they may be, it will be proper to have them *well ringed*, to prevent them from breaking into corn-fields during harvest; and that operation ought to be performed as early as possible, or the practice recommended by Mr. Tubb, a spirited breeder, at Lord Somerville's cattle-

show, in 1805, may be substituted in the room of ringing. It consists simply in shaving or paring off, with a razor or sharp knife, the gristles on the tops of the noses of young pigs; the place soon heals over, and they are thus rendered incapable of that destructive rooting, or turning up of the ground, which farmers find so detrimental to sward land.

Lastly, sows may be allowed to breed till they are six years old; and a boar to serve them till he has past his fifth year: after that time, the former may be spayed, and put up to fatten, and the latter may be castrated, as he is then no longer fit for generation, though his flesh will make excellent bacon. Throughout the management of these animals, the strictest regard to *cleanliness*, as already intimated, should be observed; for, notwithstanding they are, when left to themselves, proverbially filthy, it is certain they will uniformly thrive better and more speedily if the sties are kept clean and dry, and well littered with straw; the expense of which will be more than compensated by the value of their *dung*; which, as well as every other species of filth, ought carefully to be removed.

WEIGHT OF CATTLE.

HAVING thus stated the leading particulars connected with cattle, we shall conclude this part of the present work, with a few remarks on the *Scale* and *Weight* of beasts, when properly fattened for the markets: and, in order to ascertain this point, the following hints may perhaps afford some guide to the farmer's judgment.

First, when the general shape and composure of an animal appear best proportioned, each member being comely, and each bone covered with flesh in the manner required to constitute a perfect shape, it may be concluded that the beast is well fed; especially when his hip-bones, or, as they are sometimes termed, his huckle-bones, are round, his ribs smooth, and not sharp, his flanks full, and cod round. When these marks are perceptible, the beast may be handled, and his lowermost ribs felt; if the skin be *kindly* or *mellow*, that is, soft, yet firm to the touch, it is certain that he is well fed outwardly, or, in other words, upon the bones. Next, the hand may be laid upon the hip, or huckle-bones, and if they likewise feel soft, round, and plump, it may be safely concluded that the animal is well fed, both externally and internally; that is, both in flesh and in tallow. Farther: he may be handled at the setting on of his tail, which, if it be thick, full, and soft to the touch, is also an indication that the beast is well fed externally; the same circumstance is likewise evinced by the *nach-bones*, which lie on either side of the setting on of his tail, feeling mellow, or soft, and loose. Lastly, the cod may be examined, if an ox, or the navel if a cow, and if they respectively feel thick, round, large, and plump, it is a certain criterion that the beast is well tallowed within; though, when any of these parts or members handle contrary to the rules above-mentioned, a contrary judgment must be formed.

After all the attention and labour which the grazier may bestow, his hopes are liable to be frustrated, in some measure at least, unless he select a proper time for the disposing of his fat cattle. The most common season for beef is at Michaelmas, when the markets are more abundantly and more cheaply supplied than at any other

period of the year, as the numerous cattle which have been fattened on luxuriant pasture grounds are then brought for sale. Hence the attentive grazier will find it most beneficial, at this time, to dispose only of part of his stock. Beasts are chiefly driven to London for sale; and, where the distance from the metropolis is very considerable, they are liable to many calamities or accidents on the road, beside their diminution in point of weight; which, even under the eye of the most attentive drivers, is necessarily incurred, and is often great: while, from the fluctuation of the markets, like that of the funds at the Stock Exchange, his risk is very considerable. It will, therefore, be advisable, where it can be conveniently or advantageously effected, to dispose of fat stock in such markets as are in the vicinity of, or at an easy distance from the farm.

In drawing off one or more lots of cattle for sale, it is the general practice to dispose of the fattest animals, and to keep those which do not fatten kindly for additional exertions. Such procedure may, indeed, as Mr. Young has observed, be admitted to a certain extent, if the food provided be not expensive; but, if the beasts are reserved for corn or cake-feeding, or if the supply of other food is precarious or limited, this conduct is highly questionable. Costly food should on no account be given to cattle that have evinced themselves to be unthrifty; on the contrary, the most thriving animals in the lot ought to be chosen for this purpose, for the pursuing of an opposite conduct has often been the reason why all winter fattening has been so heavily censured and condemned. As soon as a grazier is fully convinced that he has a beast which is not kindly disposed to take on fat, or is an *ill-doer*, the *first* loss is obviously the least, and he should dispose of the unthrifty animal the earliest opportunity.

The common mode of selling cattle for slaughter is by *lots*; and, in this case, to prevent confusion between the parties, or loss on the part of the feeder, care should be taken to fix the precise time in which any particular lot is to be drawn, in order that no unnecessary food may be consumed. Formerly, and even now, in some places, it is usual to sell by the *eye*, a method which is certainly unequal, as it respects both the farmer and the butcher; for the former, unless he has been accustomed to weigh his beasts during the progressive stages of their fattening, can form at best but an uncertain idea of their weight; while the latter, from his continual practice, is enabled to form a tolerably accurate estimate. Hence some have killed a beast out of a particular lot, with a view to ascertain the average weight of animals in such lot; and, in order to induce a perfect equality between the buyer and seller, it was proposed by the late Lord Kaimes, to dispose of every beast by weight, and that such weight should be ascertained by the steelyard, as being best calculated for weighing heavy goods; which mode he used with ease and success for many years.

With regard to fat calves, we would observe, that, in general, by weighing the animal alive at the time of sale, and from the gross weight deducting eight pounds from every score, to be allowed to the butcher, the remainder will prove to be the weight of the four quarters. This rule may be illustrated by the following example: a farmer has occasion to know the value of a calf at 8d. per pound: properly securing him so as not to hurt the beast, he weighs him with scales or steelyard, or in a weighing machine, and finds the weight to be ten score, or 200lbs. From this weight let eighty pounds, or eight pounds from each score, be deducted; the remainder will be 120lbs. the weight of the four quarters very nearly; which, at 8d. per pound, will be

4l. and so of any other weight or price. As this rule will not, in general, vary more than four ounces or half a pound in a quarter or side, it will be found to answer sufficiently well for the purpose.

It is not, however, sufficient to ascertain the weight of a living fatted beast or bullock. Different parts of the same animal are different in their value: and, as he observes, there is a rule for ascertaining the proportion of these various parts, by which their weight may be known with almost equal certainty as the weight of the whole beast. But, before we proceed to specify such rule, it is necessary to premise, that the following proportions are calculated chiefly for Scotch cattle, to which only Lord Kaimes's experience reached; but, as great numbers of these are fattened in England, especially in the county of Norfolk, we trust the annexed hints will be found useful.

The four quarters* constitute half the weight of the bullock; the skin is the eighteenth part; the tallow the twelfth part; making twenty-three thirty-sixths, or about two-thirds of the whole; the remaining third part, or a little more, is composed of the head, feet, tripe, blood, &c. which offals never sell by weight, but at a certain proportion of the weight of the beast. They commonly produce 10s. 6d. when the bullock weighs one hundred Dutch stone, and so on in proportion. These particulars being adjusted, the next point which the seller is to ascertain is, the market price of butchers' meat, tallow, and hides. Supposing the bullock† to be sold is seventy-two stone living

* Kaimes' "Gentleman Farmer," p. 209.

† As the weight of beasts varies accordingly as their bellies are more or less full, it is necessary to state, that the proportions above stated were made out when the cattle were weighed at eleven o'clock in the forenoon.

weight, the four quarters make thirty-six stone, which, at 4s. per stone, or 3d. per pound, amount to 7l. 4s. The hide is worth 16s. at 4s. per stone; and the tallow, being 5s. 4d. the stone, is worth 1l. 12s. sterling. The offals, according to the proportion above stated, will give 7s. 6d.; and, by that computation, the value of the bullock is 9l. 19s. 6d. which answers to 2s. 9½d. per stone, living weight. And therefore, if a butcher agrees to give that sum per stone, no more is necessary to ascertain the price of the whole carcass than to weigh the beasts, three or four together, as the scale can hold them. But out of this sum must be deducted the butcher's profit, which cannot be much less than 5l. per cent. though we believe it is at present somewhat more.

The weighing of cattle alive, as Lord K. remarks, answers another purpose, viz. to discover whether the feeder gets the value of the food by the additional weight of the beast. For instance, supposing the food of a bullock costs 9d. *per diem*, or 5s. 3d. per week; if the animal does not take on two stone per week, the keeper is a loser, and, as already intimated, it will be highly imprudent to keep such a beast on hand, unless in expectation of a rising market.

With regard to the disposal of swine at the markets, both in a *fat*, and in a *lean* state, it may be observed, that, from actual and repeated experiments in *fat hogs*, every twenty pounds of live weight will, when killed, produce from twelve to fourteen clear weight. Where the hogs do not exceed twelve stone, of fourteen pounds to the stone, the weight will be twelve pounds; if they be of a larger size, it will be, upon an average, about fourteen pounds; so that, if a farmer or breeder weigh his beasts while alive, he will be enabled to ascertain the net profitable weight

when dead; and likewise, by weighing the hogs every week, to fix the best time for disposing of them to advantage; because, as soon as the animal ceases to acquire that daily increase which makes it beneficial, the best step that can be followed is to sell, or slaughter him without farther delay.

With regard to the buying of hogs in a *lean* state, the most certain criterion by which any judgment can be formed, is by weight; and, therefore, if a few lean pigs, of the same size as those intended to be purchased, be previously weighed, a standard will be obtained, which will enable the purchaser to decide with some precision, and, consequently, to offer a proper price in the market.

With a further view to assist farmers and graziers in more accurately determining the weight of cattle, the ingenuity of modern times has called in the aid of measurement; so that by measuring round the girth with a cord, and ascertaining the number of feet and inches it is in circumference, and also by measuring from the fore part of the shoulder to the setting on of the tail, and ascertaining the number of feet and inches the animal is in length, the precise weight of a beast (sinking the offal), may be known. But as these calculations cannot here be *generally* stated, so as to afford information suited to every *particular* case, the reader is referred to Mr. Renton's "Grazier's Ready Reckoner," or to Mr. Ainslie's "Tables for computing the Weight of Hay, Cattle, Sheep, Hogs, &c. by Measurement;" both of which useful publications are accompanied with rules for taking such measurement.

The two following tables may not inappositely conclude this part of our work; they are selected from a valuable

tract of Lord Somerville's, entitled, "Facts and Observations relative to Sheep, Wool, Ploughs, Oxen," &c. (8vo. 1803), in which are exhibited the various weights adopted in different counties and districts for equalizing the different modes of calculation.

T A B L E

FOR THE

EQUALIZATION OF DIFFERENT WEIGHTS.

Scores.	Stones at 14lb.		Stones at 8lb.		Scotch Stones, 16lb.		Hundred 112lb.		
	<i>st.</i>	<i>lb.</i>	<i>st.</i>	<i>lb.</i>	<i>st.</i>	<i>lb.</i>	<i>cwt.</i>	<i>qrs.</i>	<i>lb.</i>
20 equal	28	8	50	0	25	0	3	2	3
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

CHAP. IV.

HORSES.

IN the selection of horses for the purpose of agricultural labour, the points that demand the farmer's or breeder's attention, are strength, soundness of constitution, hardiness, and true draught;—properties these which are found to concentrate only in the Clydesdale or Lanerkshire breed, in the Cleveland bays, in the Suffolk, and last, though not least in value or merit, in the old English draught horse. To these breeds, therefore, we shall at present call the reader's attention; referring him to a former section (p. 64.) for a view of the long-contested question respecting the superiority of oxen over horses.

I.—CLYDESDALE HORSES.

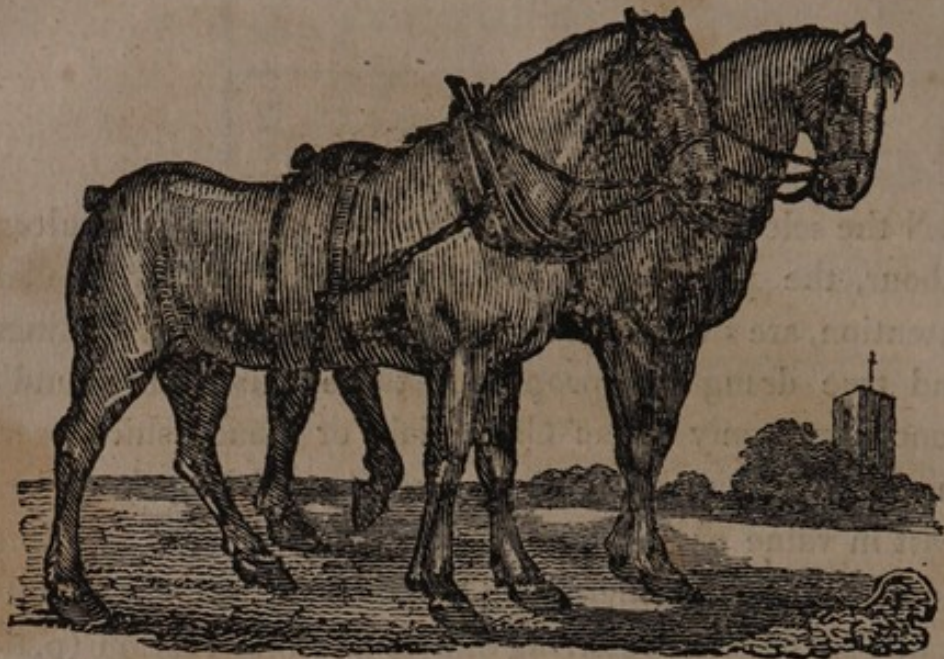
This breed is strong, hardy, active, and eminently calculated for hilly districts. The colour is generally brown, or grey; the legs are sinewy and clean; the eyes sprightly and animated; the head and body light and well-formed; from fifteen to sixteen hands and a half in height.

II.—THE CLEVELAND BAYS

Are bred in various parts of Durham and Northumberland, and particularly in the district of Cleveland, Yorkshire, whence they have received their name. They are of a large size, and in point of activity, hardiness, and strength, superior to most kind of horses. They are well formed, and, for the most part, of a bay colour.*

* Culley on Live Stock.

III.—SUFFOLK PUNCHES.



The Suffolk punches, or Suffolk punch sorrels, as they are also termed, are singularly useful for those departments of agriculture which may require the labour of horses. The sandy tract of land in the vicinity of Woodbridge, Suffolk, has long been celebrated for the production of this breed, which is generally allowed to afford the best cart-horses in England. The Suffolk punches are of a bright sorrel colour; have very low foreheads; large bodies, somewhat similar to those of cows; short legs; and ill-formed heads: but, notwithstanding their awkward appearance, they exceed every other race of horses in draught. They are of various sizes; but the smaller ones (fourteen hands and a half high, which cost about 40*l.* or 50*l.* per pair) are found, in general, to be the most serviceable.

The figures above given were drawn from two capital punches, belonging to Mr. Wakefield of Burnham, in the county of Essex.

IV.—THE OLD ENGLISH DRAUGHT HORSE



Is remarkable for its beauty, symmetry of form, and large size. Possessing singular strength for draught, this race is in high request in the counties of Leicester, Northampton, Lincoln, and a few other shires to which they are suited, and affords an ample source of profit to graziers and breeders. This breed possesses strength of constitution, hardiness, and bone in such a superior degree, that, as every attention is paid to the corresponding points both in sires and dams, these horses produce very handsome prices. They come in to use, in general, at two years old, or under; and if brought to a good size in proper time, from thirty to fifty pounds, or guineas, are often given at two or three years old. The figure above given represents an improved cart-horse of the native English breed.

IN addition to these hints, it may be remarked generally, that the Clydesdale, or Lanerkshire horses, on account of their singular hardiness, and generally easy pur-

chase, are preferable for elevated or hilly places; while the Cleveland bays (which are reared principally in the counties of Durham, York, and Northumberland) are best calculated for work requiring much effort and dispatch; and the Suffolk punches are well adapted for long-continued exertion; being, like the Clydesdale horses, both hardy and of easy purchase.

In a wild state, the horse is usually of an inelegant form, and extremely intractible; but, when domesticated, he becomes docile, yet bold and intrepid, and, for the most part, attached to man.

The breeding of these useful animals, as a distinct concern, can only be carried on, with any prospect of success, in those districts where a farm comprises an extensive tract of coarse pasturage, which cannot be advantageously appropriated to the fattening or grazing of cattle. Of this description are part of the North Riding of Yorkshire, the fens in the county of Lincoln, and some of the midland counties. In such case, the same attention must be paid to symmetry of form, purity of breed, and individual excellence, as in breeding cattle in general. The attention, however, in this case should not (as is most commonly practised) be confined chiefly to the stallion. In most instances, (so far as experience has hitherto shewn), it has been found that in regard to form and other good qualities in the progeny, more depends on the mare than on the horse. It is always of importance to select a stallion as similar in colour and form as possible to those of the mare; as, by this practice, there is the greater probability that the foal will possess the joint properties both of the sire and dam, and will turn out more agreeably to the wishes of the owner than when more violent crosses are attempted. For instance, if a half-bred mare is put to a great, heavy,

clumsy cart-horse, or *vice versâ*, the stock turns out a kind of mongrel breed, rarely possessing, in any considerable degree, the strength or size of the one, or the spirit, activity, and fine bone of the other.

The HORSE should be bold and spirited, well made, and of a kindly disposition: his constitution should be strong, his temper good, and free from *diseases of every kind*. With respect to the properties of a good BREEDING MARE,—she should be well-shaped; possess a gentle disposition; have a large carcass, proportioned to her height; be pretty full-bellied, and likely to become a good nurse, or have plenty of milk. Mares, intended to supply the team with draught-colts, should (Mr. Banister observes*) be large-limbed, close-jointed, short-necked, and wide-chested, with a capacious body. Her eyes should be clear, full, and pellucid: and her nostrils large and open: her disposition should be gentle and tractible; her constitution healthy and vigorous, and free from any blemishes, hereditary or acquired. For, on the good qualities and strength of constitution in the sire and dam depend, in a great measure, the future welfare of the colt.

The mare produces one foal after a gestation of about eleven months: the time of putting her to the horse varies from April to May—the earlier in the spring the better; because it will prove of much moment to have the foal dropped in the close of January, or, at all events, in the course of February.

While breeding, mares may be gently but carefully worked, in order to keep them in health by proper exercise; and they should likewise be kept in good heart, as their

* “Synopsis of Husbandry,” 8vo. 2d. edit.

offspring will otherwise be weak or unhealthy. After the foals are dropped, the mares ought likewise to be kept in prime condition, that the young animals be not stunted in their growth for the want of a sufficient supply of milk. During the first summer they may be allowed to run with their dams until Michaelmas, or even longer if the weather continue open and mild. They should then be weaned and kept in a stable, with low racks and mangers for receiving their food; which ought, at first, to be the sweetest hay that can be procured. Where rouen or after-math can be commanded, it will furnish a succulent and invigorating article of food; but both with hay and rouen, bran, oats, or pollard, should be given in due proportions, which, indeed, can only be ascertained by experience. Where, however, oats form a part of the food of horses, especial care should be taken to see that these actually receive the grain; and, with respect to colts in particular, it has been recommended to bruise or crush them previously in a mill; which necessary precaution will prevent the distension of the lower-jaw veins, which would otherwise attract the blood and humours down into the eyes, and thus occasion blindness. Further: by feeding colts with oats, in conjunction with other articles, another benefit will result, viz. that their legs grow broader and become better knit than when they are fed only with bran and hay, while they will also be enabled to endure greater fatigue.

Colts should be carefully kept from wet and cold, as their tender frames would receive material injury from either. During fine weather they may be turned out into a dry sweet pasture (where pure water can be obtained for them to drink at pleasure), for a few hours, and should then be conducted to the stable. Thus they will acquire a habit of docility; and, when broken in for the saddle or for labour, will work quietly: the proper time for this

purpose may be from two years and a half to three years of age.

No horse should be less than four years old that is intended to propagate the species; nor should any mare be allowed to breed after eighteen, or any stallion be kept for that purpose longer than eighteen or twenty years, as they are then only fit for the harness. Castration is commonly performed when the colt is twelve or eighteen months old; but the more general practice is, to defer that operation until the animals are at least two years old, when they will retain a greater degree of strength and spirit. It ought, however, to be observed, that some experienced breeders perform the operation of gelding when the foal has attained the age of three months, on account of the comparatively less danger of inflammation in young animals. When the mares bring forth early, the close of May or beginning of June has been thought a proper season, if the weather be not too warm.

The feeding of horses (whatever number may be employed) is an object of great importance, on account of the heavy expense of corn-feeding. With a view to reduce this, it has been proposed to soil them with lucerne, tares, or clover, instead of turning them out to grass during the summer: and experience has proved this method to be very beneficial; for, if they be well littered, the manure thus obtained will nearly repay the expense of their maintenance. Further: in order to diminish the charge of corn-feeding, carrots have been advantageously employed as a winter food in lieu of oats. This practice originated, we believe, in the county of Suffolk, whence it has spread through various parts of England. Carrots, indeed, are not only cheaper, but in every respect more wholesome than oats, and infallibly recover broken-winded horses, unless

the disease has, from long neglect, or injudicious management, become incurable. Where, however, grain is used, the most economical method is to boil it, and give it to the horse, in a cool state, with the liquor; giving in the course of the day a due proportion of hay. A considerable reduction may likewise be made, by cutting the hay or straw into chaff before it be given them; with a small quantity of which, together with a few carrots and *boiled potatoes*, horses have been kept through the winter with very great success. The bruised tops of furze, where these can be conveniently and early procured, will also effect a considerable saving in the articles of hay and oats; and, at the same time, afford to the animals a grateful food.

It is in many situations a frequent practice to turn horses loose upon commons in order to feed: but this exposes them to numerous maladies. "The horses," Mr. Parkinson observes, "get full of bots, or the small needle-worms; or, in dry summers, of sand. A horse of mine which had run upon the common in summer, died; and I was desirous of knowing what occasioned his death. On opening him, above a peck of sand was found in his great stomach or bag. In mild winters, horses which have run the summer in the fens do the best there in winter; for, as all horses feeding on low grounds get the bots or grubs (which are natives of such grounds), so, while the horses continue there eating green food, the bots and worms do him little mischief, as they will prefer that kind of nutriment to what they might get by preying upon the animal. But when the horse quits grass, and is taken to dry meat, the bots and worms begin to devour his bowels. They gnaw them, consume the chyle, and prevent the proper supply to the blood; which assumes much the same appearance as that of rotten sheep. His head begins to swell, and so do his

legs : and some get what is called the *felteric*. The greater the quantity of corn and dry meat you give him, the worse he becomes ; and the only method left to save him is, to keep him on grass. If you have carrots or potatoes, they would answer much better than corn or any dry food. I have lost several horses by this sort of disorder ; having, from the desire of collecting manure, put them into a straw-fold, which I now know to be a certain method of dispatching them quickly. Chopped straw, which I have hitherto so strongly recommended as the most wholesome and cheapest food, is here rank poison ; a proof that there is no rule without an exception, as I have felt to my cost. When any of my horses died of this distemper (or indeed of any other), I generally opened them by way of practice ; and have frequently found the principal stomach (or *bag* as the farriers term it), nearly eaten through by these destructive vermin : all that died of the bots had the coat of the stomach nearly destroyed. If you turn beasts upon a common at a year old, and give them straw in the winter, they will increase in age, but very little in size when three years old : consequently there is little gain.”*

Of equal importance with the feeding of horses is the management of them when their daily labour is performed ; but concerning the best mode of doing this, a considerable difference of opinion prevails. By some it is remarked, that the keeping of horses in stables, with separate stalls for each, so that they may feed quietly and be expeditiously harnessed, is, in every respect, the most preferable method, provided a free current of air pass through the stables. Others, on the contrary, assert that sheds, open to the front, with racks and mangers fixed below, and having a pump and cistern, as well as a small yard, in

* “ Parkinson’s Experienced Farmer,” vol. 1, p. 22.

which they may run at pleasure, are superior to the stable method ; because, if well littered, the horses will not require any other dressing than is usually given by farmer's servants. Since, however, these animals are very susceptible of cold, it would perhaps be most advisable to keep them in stables in all exposed and bleak situations ; but in mild and sheltered places, the shed system will be found the most profitable. By the Earl of Darlington, who followed the practice for several years, it was found to answer very successfully ; and his lordship remarked, that horses thus managed are not only more healthy than those kept in stables, but are also enabled to work well even after they have attained the age of twenty years.

The expense of keeping horse-teams cannot be estimated with any degree of precision, on account of the fluctuating prices of oats, &c. as well as from the different methods of keeping. Reckoning, however, the consumption of oats in well-fed horses to be about ten quarters, and of hay about thirty-five hundred weight, together with 16s. or 20s. for shoeing, the charge may perhaps be computed at about 32l. or 36l. per annum.

AGE OF HORSES.

The following hints relative to the age of these useful animals and the essential characteristics of a good horse may not improperly conclude the present outline. In old horses, then, the eye-pits are generally deep, though this mark is very uncertain, as it also occurs in young horses that are descended from aged stallions. But the most certain criterion is that derived from the teeth, the number of which amounts to forty ; namely, twenty-four grinders or double teeth, (which in fact afford no certain guide), and

sixteen others, viz. four tushes or tusks, and twelve fore-teeth: these last are the surest guides for discovering the age of a horse. As mares usually have no tusks, their teeth are usually thirty-six. A colt is foaled without teeth; in a few days he puts out four, which are called pincers, or nippers; soon after appear the four separators; next to the pincers, it is sometimes three or four months before the next, called corner teeth push forth. These twelve colt's teeth in the front of the mouth continue without alteration till the colt is two years or two years and a half old, which makes it difficult, without great care, to avoid being imposed on during that interval if the seller finds it his interest to make the colt pass for either younger or older than he really is: the only rule you have then to judge by is his coat, and the hairs of his mane and tail. A colt of one year has a supple rough coat, resembling that of a water spaniel, and the hair of his mane and tail feels like flax, and hangs like a rope untwisted: whereas a colt of two years has a flat coat, and straight ears, like a grown horse.

At about two years and a half old, sometimes sooner, sometimes later, according as he has been fed, a horse begins to change his teeth. The pincers which come the first, are also the first that fall; so that at three years he has four horse's and eight colt's teeth, which are easily known apart, the former being larger, flatter, and yellower than the other, and streaked from the end quite into the gums.

These four horse-pincers have in the middle of their extremities a black hole, very deep; whereas those of the colt are round and white. When the horse is coming four years old, he loses his four separators, or middle teeth, and puts forth four others, which follow the same rule as the

pincers. He has now eight horse's teeth and four colt's. At five years old he sheds the four corner, which are his last colt's teeth, and is called a horse.

During this year also, his four tusks (which are chiefly peculiar to horses) come behind the others; the lower ones often four months before the upper; but whatever may be vulgarly thought, a horse that has the two lower tusks, if he has not the upper, may be judged to be under five years old, unless the other teeth show the contrary; for some horses that live to be very old never have any upper tusks at all. The two lower tusks are one of the most certain rules that a horse is coming five years old, notwithstanding his colt's teeth may not be all gone.

It is not an unfrequent practice of jockies and bréeders, in order to make their colts seem five years old when they are but four, to pull out their last colt's teeth; but if all the colt's teeth are gone, and no tusks appear, you may be certain this trick has been played: another artifice they use, is to beat the bars every day with a wooden mallet in the place where the tusks are to appear, in order to make them seem hard, as if the tusks were just ready to cut.

When a horse is coming six years old the two lower pincers fill up, and, instead of the holes above-mentioned, show only a black spot. Betwixt six and seven the two middle teeth fill up in the same manner; and between seven and eight the corner teeth do the like; after which it is said to be impossible to know certainly the age of a horse, he having no longer any mark in the mouth.

You can indeed only have recourse to the tusks and the situation of the teeth, of which I shall now speak.

For the tusks, the purchaser must with his finger feel the inside of them from the point quite to the gum. If the tusk be pointed flat, and has two little channels within side, he may be certain the horse is not old, and at the utmost only coming ten. Between eleven and twelve the two channels are reduced to one, which, after twelve is quite gone and the tusks are as round within as they are without; he has no guide then but the situation of the teeth. The longest teeth are not always a sign of the greatest age, but their hanging over and pushing forward, as their meeting perpendicularly is a certain token of youth.

Many persons, whilst they see certain little holes in the middle of the teeth, imagine that such horses are but in their seventh year, without regard to the situation the teeth take as they grow old.

When horses are young their teeth meet perpendicularly, but grow longer and push forward with age; besides, the mouth of a young horse is very fleshy within in the palate, and his lips are firm and hard: on the contrary, the inside of an old horse's mouth is lean both above and below, and seems to have only the skin upon the bones. The lips are soft, and easy to turn up with the hand.

All horses are marked in the same manner, but some naturally and others artificially. The natural mark is called beguë; and some ignorant persons imagine such horses are marked all their lives; because for many years they find a little hole, or a kind of void in the middle of the separators and corner teeth; but when the tusks are grown round, as well within as without, and the teeth point forward, there is room to conjecture, in proportion as they

advance from year to year, what the horse's age may be without regarding the cavity above-mentioned.

The artificial manner is made use of by dealers and jockies, who mark their horses, after the age of being known, to make them appear only six or seven years old. They do it in this manner: they throw down the horse to have him more at command, and, with a steel graver, like what is used for ivory, hollow the middle teeth a little, and the corner ones somewhat more; then fill the holes with a little rosin, pitch, sulphur, or some grains of wheat, which they burn in with a bit of hot wire, made in proportion to the hole. This operation they repeat from time to time, till they give the hole a lasting black in imitation of nature: but in spite of all they can do, the hot iron makes a little yellowish circle round the holes like what it would leave upon ivory: they have therefore another trick to prevent detection, which is to make the horse foam from time to time, after having rubbed his mouth, lips, and gums with salt, and crumbs of bread dried and powdered with salt. This foam hides the circle made by the iron.

Another thing they cannot do, is to counterfeit young tusks, it being out of their power to make those two cranies above-mentioned, which are given by nature; with files they make them sharper or flatter, but then they take away the shining natural enamel, so that one may always know by these tusks horses that are past seven, till they come to twelve or thirteen. The engraving annexed to these remarks on horse's teeth will, it is hoped, illustrate the preceding hints; being drawn from the teeth themselves, at the various ages therein specified.

With regard to the circumstances indicating a *sound* horse, it may be observed, that, where a horse is free from

blemish, the legs and thighs are well shaped; the knees straight; the skin and shanks thin; the back sinews strong and firm. The pastern joints should be small and taper, and the hock lean, dry, and not puffed up with wind. With respect to the hoof itself, the coronet ought to be thick, without any tumour or swelling; the horn bright, and of a greyish colour. The fibres of a strong foot appear very distinctly, running in a direct line from the coronet to the toe, like the grain of wood. Such a foot, however, ought to be kept moist and pliable, as it is subject to fissures and cracks, by which the hoof is sometimes cleft through the whole length of the coronet. A narrow heel is likewise a great defect; and if it do not exceed two fingers in breadth it forms an imperfect foot. A high heel often causes a horse to trip or stumble: while a low one, with long yielding pasterns, is apt to be worn away on a long journey. On the other hand, a foot disproportionately large renders the animal weak and clumsy in its gait.

The head of a horse ought to be small, and rather lean than fleshy; his ears should be erect, thin, sprightly, and pointed; the neck arched towards the middle, tapering gradually towards the head; the shoulders rather long; the withers thin, and enlarge by degrees as they extend downwards, yet so as to render his breast neither too gross nor too narrow. Such are the principal characters by which the best form and proportion of that useful animal may be determined.

CHAP. V.

ASSES—MULES.

THESE useful animals, when domesticated, are remarkable for their meekness, patience, tranquillity, and (though too often treated with cruel harshness), attachment to their masters. No beasts, perhaps, are capable of supporting heavier burthens, in proportion to their size, than asses; on which account they are principally employed in drawing huckster's carts. But it appears from actual experiment, that these useful animals may be employed to great advantage in drawing waggons and other carriages. Thus the Earl of Egremont, ("Annals of Agriculture," vol. 37), early in 1800, formed a team, consisting of six male asses, and, during nine months, he found them of great service. They brought one chaldron and a quarter of coals twice a day, in a waggon, from the canal to his lordship's house at Petworth, which shews a great degree of strength not to be expected of them. They were gentle and docile; during winter they had no oats, nor any other hay than the bands of the trusses consumed by horses, but lived on furze and holly.

A more striking instance of the utility of asses for the purpose of draught has been communicated to the public by Mr. Worthington, who made use of the implements in common use, except as to size, accommodating the height of his wheels, &c. to the line of draught, enabling his asses

to draw without any inconvenience; and employed them in various departments of agricultural labour. His practice is to work four asses at plough, yoked two a-breast, driven in hand with reins by the ploughman: and he found that they were more than masters of the work required from two common farmer's horses of a slight kind. Mr. W. esteemed an acre a good day's work; but in cross ploughing they would do more; at such work two asses were sometimes enough, and two were also sufficient in turning the furrow at potatoe-planting. The soil on which these animals were employed was a loamy stone brash, of middling but varying depth, and tenacious rather than light.

The *diseases* of the ass, so far as they are known, bear a general resemblance to those of the horse. As, however, he is more exposed and left to live in a state more approaching to that which nature intended, he is subject to few diseases. But *these few* are less regarded than they deserve to be: the ass is seldom troubled with vermin, probably from the hardness of its skin; which, when tanned, makes the most durable shoes of any sort of leather.

“In respect of consumption,” concludes Mr. Worthington, “I can only add, that the ass is a temperate eater; and that he appears to thrive best when left at large to his bramble-leaves (which flourish almost through the whole winter), with a little corn at his breakfast and at the close of work, and a bite of hay at noon in his geers; and he may also be safely trusted abroad with his associates, as, unless in his rutting season, he scarcely ever strays. He loves grains, and will eat them freely; and is fond, beyond any other food, of the culinary roots, in particular of potatoes and carrots.”

As, therefore, the preceding statements fully prove the hardy nature of asses, and as these useful animals may

be kept at a trifling expense, they certainly deserve the consideration of every intelligent farmer and breeder; and we fully concur in the opinion of Mr. A. Young, that "they will be found by far the cheapest team that can be used."

MULES

Are a mongrel kind of animal, partaking of the nature both of a horse and of an ass. They are very hardy, strong, sure-footed, durable, and live to a great age; on which account they are much used in warm climates. These animals are also employed to some extent in Ireland, and in some of the northern counties of Britain: those which are bred in cold countries are reckoned to be more stout and fit for labour than such as are bred in warmer climates.

In the breeding of mules, it will be requisite to select the finest male asses, and young, lively, well-formed mares: and it has been observed, that they take so much after the mares from which they are bred, that they may be procured of any kind, light or strong, as the owner pleases. If he-asses fit for the purpose cannot be procured, it has been recommended to get a strong male, and two female asses; and to take especial care of their colts, which will, in the course of three or four years, be fit for the purpose. Young mule colts will require to be housed during the first winter, so that they may be frequently handled, in order to make them tractible. At three years of age they may be broken in, and should be moderately worked until four; after which, with proper management, they will continue

in full vigour till they are past thirty, and even forty years. But no wheat or rye straw should be given, *in any form*, as it will disagree with them, and render them unfit for labour.

It is a general complaint against (and probably also an objection to the more frequent use of) mules, that they kick and are stubborn: but this is rather owing to neglect in breeding them, for they are as gentle as horses in those countries where they are reared with more care. Mules bred between the mare and male ass are the most valuable: those, on the contrary, which are produced from the horse and she-ass are held in least esteem; they are in general very dull, of a small size, and take most after the nature and constitution of the ass.

CHAP. VI.

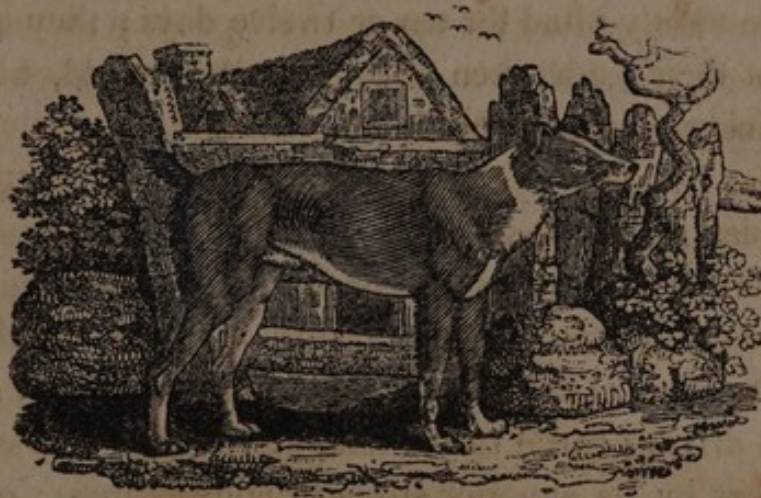
DOGS.

AMONG the various animals which the benevolent hand of Providence has bestowed for the use of mankind, the DOG deservedly holds a distinguished rank, on account of his sagacity, docility, fidelity, and affection for his master. To omit the numerous varieties of these useful animals, which are kept either for the purpose of show, hunting, or amusement, we shall now call the reader's attention to two kinds that are peculiarly useful to farmers, graziers, and all indeed who have any thing to do with the keeping or management of cattle.



The *Shepherd's Dog*, which is delineated in the preceding cut, occurs chiefly in the extensive sheep-walks in the northern parts of this island; where the purity of its breed

appears to be preserved in the greatest perfection. Its docility and sagacity, indeed, surpass those of every other variety of the canine race: obedient to the voice, looks, and gestures of his master, he quickly perceives his commands, and instantly executes them. A well-trained dog of this kind is, to a shepherd, an invaluable acquisition. The faithful animal anxiously watches the flock, keeps them together in the pasture, from one part of which it conducts them to another; and, if the sheep are driven to any distance, a well-trained dog will infallibly confine them within the road, and, at the same time, prevent any strange sheep mingling with them. Should, however, any straggle from the road, he will pursue them, and drive them to the flock, without hurting them in the slightest degree.



The *Cur Dog* is a distinct species, which of late years has been singularly valuable to farmers and breeders of cattle. He is, in general, of a darker colour, and also stronger, more fierce, and larger in point of size than the shepherd's dog: to which he is often superior in sagacity. This kind knows his master's fields, where it watches the cattle with peculiar vigilance, regularly going its rounds; and if any strange beasts appear among them it compels these speedily to withdraw. The colour of this species is,

in general, black and white, with half-pricked ears; they bite very keenly; and, contrary to the habit of many dogs, they constantly attack cattle at their *heels*, which is an advantage, not only in exposing beasts the less to *laceration*, but also in depriving these of any defence against the dogs; so that they become peculiarly useful in driving cattle.

Dogs live, in general, to the age of fourteen or fifteen years, but rarely survive twenty. The female breeds during the first year, and usually brings forth from six to twelve puppies, after a gestation of about nine weeks: small-sized dogs, however, whelp five, four, and only two. The puppies are mostly blind for ten or twelve days; they also lose some of their teeth when about four months old, but these are quickly succeeded by others.

Besides the two varieties above described, there is a mongrel breed, possessing several qualities of the cur, shepherd's dog, greyhound, and mastiff. It is usually found in the possession of drovers, to whom it is particularly serviceable in driving cattle to the slaughter, both by its sagacity, as well as by its superior strength and swiftness; qualities which are indispensably necessary for the long journeys they not unfrequently have to travel.

In Prussia there is a peculiar breed of dogs employed in the management of sheep: it is described by M. Lasteyrie as totally different from the shepherd's dogs usually found in France, being of a small size, but stout and thick, with erect ears. The Prussian dogs bear some resemblance to our wolf dogs: their coats are partly smooth and close, while others are long and shaggy. They are remarkably

docile; *never bite the sheep*; and, at their master's voice, repair instantly towards that part of the flock which is pointed out: in case the sheep hang behind, *these dogs push them forward with their muzzles*; which is sufficient to make the sheep take the requisite direction.* An importation, if it could be effected, of a few of this breed, would certainly be worth the trial; particularly if the Prussian mode of teaching them, so as not to *bite*, could be acquired. It is, indeed, a most desirable object, that our shepherds should never accustom their dogs to bite sheep; as these naturally timid animals are afraid at the approach of a dog, often crowd together, and wound one another. The continual state of fear in which they are, particularly where a dog has not been properly trained, disturbs their repose, and prevents them from feeding quietly, which is further very injurious to their health, and consequently to the interests of the sheep-master; and, in fact, it rarely happens in any flock, that there are not some sheep which are from time to time lacerated, more or less severely, by the bite of dogs.

* Lasteyrie, p. 192.

CHAP. VII.

POULTRY—RABBITS.

UNDER the term *Poultry* is comprised every species of land and water fowl, and also pigeons: on each of these we shall offer a few remarks.

I.—LAND FOWL.

1. Of *Common Fowls* there are several breeds, known by the names of the Bantam or Game-breed—the Poland or Black breed—the Dorking—English or White—and the Shack-bag and Malay breeds. When well fed and permitted to range in a farm-yard, a good hen will lay from 150 to 200 eggs, and upwards, in the course of a year. She prepares her nest with art and care, either among bushes, or by scratching a hole in the ground: the time of hatching is preceded by a clucking noise, and the hen ceasing to lay eggs. A good hen can rear a brood of ten or twelve chickens at a time. The proportion of hens is usually six or seven to one cock.

Poultry constitute part of every farmer's stock; but it is not in every county they can be profitably reared: but if proper conveniences be provided, and with careful management, this otherwise fluctuating part of live-stock may be turned to good account.

in small pieces, with onions or leeks; and their drink may either be new milk, or milk and water. Some persons give them a thick porridge of milk and oatmeal, into which are put onions or leeks chopped small, and sometimes eggs boiled hard and cut into small pieces.

Young turkies also will require to be fed *frequently*, as the hen will not take much care of them; and when they have got some strength, they should be fed abroad in a close walled place, whence they cannot stray. Care should be taken not to let them out until the dew is off the grass, and to have them home again before night, the dews being very prejudicial to them.

When young, this species of poultry may be very expeditiously fattened by means of boiled potatoes and barley-meal, well mixed together, with chopped onions or leeks, *provided they be kept fed in a regular manner*. Nothing, in fact, can be more irrational or absurd than the practice of cramming turkies, which can only fatten in proportion to the quantity of food DIGESTED, whatever quantity may be forced upon them. Besides, it has been well observed, that they will eat their food *fast enough*, if regularly fed, however custom may have sanctioned such a method of fattening them.

The *Norfolk Turkies* have long been celebrated for their *fine flavour*: this is to be attributed to the dryness of the soil in that district, and to the *extensive range* over which they are suffered to wander, while in their young growth, rather than to any peculiar excellence in the method of fattening these birds.

3. *Guinea Fowls* (which are natives of Africa), are not so tame and domestic as native poultry. They lay a large

number of eggs, frequently from 100 to 150: they breed pretty well in this climate, but often occasion considerable trouble to their keepers by flying away into hedges and bushes, especially during the night, where they lay and hatch their eggs. They are probably better for the table than the common fowl, being larger, and having more of (what is called) the *game* flavour.

4. *Pigeons* are uncommonly prolific; and, although pigeon-houses occur on many farms, yet if these birds be suffered to increase beyond a certain proportion, they will prove highly destructive to newly-sown crops, especially of young peas, and also in the early part of harvest, by sitting in large numbers upon the standing corn, and beating down the ears. Mr. Parkinson observes, that "all farms ought to keep pigeons, to pick up the seeds of weeds in winter; as it may be observed that, whenever a pigeon is shot at that time of the year, its craw will be found full of the seeds of weeds: so that they are very useful in clearing land from weeds."*

Where pigeons are kept, an airy situation, open to the south or south-west is preferable: and common salt and nitre should frequently be given them, in order to keep them in health.

Dove-cotes, or pigeon-houses, ought to be built of a moderate height and spacious, so that the birds may find sufficient room to fly about them with ease; and, in case any external object should alarm them, that they may readily escape. In constructing the nests, it will be advisable to interweave wickers, in imitation of those formed by wild pigeons; as they will thus be more easily

* "Experienced Farmer," vol. 2, p. 406.

domesticated, and have no inducement to forsake their habitations.

Should any repairs become necessary in the cote, or in the nests, it will be proper to complete them before the middle of the day; because, if the pigeons be disturbed in the afternoon, they will not rest quietly during the night, and the greater part will perhaps sit *moping* on the ground till the ensuing day: such unfavourable accidents in the breeding season, will either occasion the destruction of many eggs in embryo, or, if there should be any nestlings, they will consequently be starved.

In Mr. Parkinson's *Experienced Farmer* we meet with a remark made by a skilful pigeon-breeder, who cautioned him "against letting the first flight fly to increase his stock," but advised him to take them without exception; because they will otherwise appear at the *benting-season*, that is, between seed-time and harvest, when pigeons are very scarce, and many of the young birds would pine to death, from mere weakness. Pigeons rise early: and, as they require to be supplied with food only during the *benting-season*, it should not be carried to the cote later than three or four o'clock in the morning: for, if it be served long after that hour, they will hover restlessly about the house, and thus be prevented from taking their proper exercise. During the greater part of the year, they ought to provide their own food; as they will find abundance in the fields from the commencement of harvest to the end of the sowing season: on the contrary, those which are constantly fed at home will not be prolific.

The spring flight generally appears in the month of April or May; when all the eggs, which have been laid too late, must be removed. And, as the weather becomes

cold after the harvest, the parent bird should not be suffered to sit so late as to be injured; for, though the young ones be hatched, they will be weakly and useless; a warm situation being most suitable to their nature.

The utmost cleanliness ought to prevail in pigeon-houses: hence the holes should be carefully examined before the breeding season arrives. If any of the young die during the summer, they will speedily become putrid, and emit a disagreeable stench, which is extremely injurious to the inhabitants of the dove-cote: thus, from the insupportable filth and smell, they are often unwillingly compelled to quit the eggs laid for a second brood; so that the principal part of the season is lost. Farther, as pigeons are very liable to be infected with fleas, all the nests ought to be cleaned; and, if it be conveniently practicable, they should be *washed out*, and the dung, or other impurities, removed, immediately after the first flight is hatched: this business, however, should, on all occasions, be performed at an early hour in the morning; and the remaining eggs must likewise be removed, so as to render the habitation perfectly clean for the harvest-flight.

Thus managed, pigeons will thrive and multiply to an uncommon degree; but, as they have a great antipathy to owls, which sometimes enter their habitations, such intruders must be immediately destroyed. Rats, cats, weasels, and squirrels, are likewise their *mortal* enemies, and will speedily depopulate a whole dove-cote. To prevent these depredations, it will be necessary to examine the different avenues to the pigeon-house regularly once a week or oftener, and with minute attention.

II.—WATER FOWL.

1. Of *Geese*, there are two sorts, the Grey Lag, or Wild Goose, and the Tame Goose, or domesticated Grey Lag. The goose in general breeds only once in the course of a year; but, if well kept, it will frequently hatch twice within that period. Three of these birds are usually allotted to a gander; for, if that number were increased, the eggs would be rendered abortive: the quantity of eggs to each goose for sitting, is about twelve or thirteen. While brooding, they ought to be fed with corn and water, which must be placed near them, so that they may eat at pleasure. The males should never be excluded from their company, because they are then instinctively anxious to watch over and guard their own geese.

The nests, in which these birds sit, ought to be made of straw, and so confined that the eggs cannot roll out, as the geese turn them every day. When they are nearly hatched, it will be requisite to break slightly the shell near the beak of the young gosling, as well for the purpose of admitting air, as to enable it to make its way at the proper time.

Geese are very valuable, on account of the feathers they afford: for this purpose they are unmercifully plucked in the county of Lincoln, (where they are reared in the largest numbers) *five times* in the year: the first operation is performed at Lady-day for feathers and quills, and is repeated four times between that period and Michaelmas for feathers only. The old birds submit quietly, but the young ones frequently prove unruly and noisy. The latter may be plucked once, when about thirteen or fourteen weeks old, for feathers; but no quills must be taken from them; nor

should this operation be performed at too early a season, because the goslings are liable to perish in cold summers.— Although the plucking of geese has by many been considered as a barbarous custom, yet experience has evinced, that these birds, when properly stripped of their feathers, thrive better and are more healthy than if they were permitted to drop them by moulting.

In the fattening of geese the same attentions are requisite as in fattening other poultry. They should therefore be confined in a dark place, at a distance from the rest, and fed with oats or other grains; being well supplied with water and sand. Another mode of fattening geese consists in giving them boiled oats with chopped carrots or ducks'-meat, alternately: but, where green geese are to be fattened, it will be necessary to give them a little green food with the grain used for that purpose. In two or three weeks they will be fit for the market.

2. *Ducks* frequent the lakes of various countries, in a wild state, where they feed on frogs and various kinds of insects: in a tame state, they may be profitably kept where there is a conveniency of water contiguous to the farmyards, when they will require but little attendance. These birds lay at an early period of the year; and though they lay a larger number of eggs, no bird should be permitted to sit on more than ten or twelve eggs. These, in the course of a month, will be hatched; and the young ducks should be kept for another month at least, or until they be tolerably strong, with the old birds, and fed with grits, oat or barley meal, mixed with boiled potatoes, as wanted, sand and water being constantly kept in shallow pans. Ducks are greedy feeders, but by no means nice in the kinds of their food: they are peculiarly fond of the entrails of other animals; and, when fattened on animal food,

(which very expeditiously accomplishes the business), they are said to have more resemblance to the wild-duck, both in the flavour and colour of their flesh, than in the common method.* Tame ducks are very useful for destroying black caterpillars, slugs, and snails, that infest turnip fields, into which they may be very advantageously turned, as they will devour the vermin, without injuring the crops.

III.—RABBITS.

In a wild state the furs of rabbits are of a brown colour; when domesticated, they are generally black, white, or pied. The two kinds chiefly reared are the common grey and the silver grey breeds, the former of which is chiefly valued for their flesh, as the latter are for their furs. The does begin to breed from six to twelve months, and are very prolific: they will bring forth seven or eight times in the year, but it will not be advisable to let them take the buck oftener than three or four times a year.

These animals are reared either in *warrens* or in *hutches*; in the former state they are permitted to roam at liberty, where they burrow and breed. The best places for such purpose are sandy hills, or those which consist of a loose soil; but it will be necessary to inclose them either with a stone or sod-wall, and at the same time to bore horizontal cavities for the passage of these quadrupeds, till they have formed their own burrows:—the most proper shrub to be planted in such situations is the juniper-tree, the leaves of which are eagerly eaten by rabbits, and impart to their flesh a delicate spicy flavour. As warrens are infested with kites, pole-cats, eagles, and other free-booters, it will be advisable to set traps on the stumps or tops of old trees,

* Dickson's Agriculture, vol. ii. p. 1212.

or on artificial hillocks of a conical form, in order to catch these depredators, as they usually alight upon such places.

If rabbits are designed to be reared in a tame state, the *hutches* must be kept constantly clean; as, otherwise, these creatures will be frequently attacked with diseases.—The males, or bucks, should be parted from the *doës*, or females, till the latter *kindle*; at which time one of the former may be allowed to six or eight of the latter; and a sufficient quantity of fresh hay should be provided, for the construction of a *bed*, or nest.

The females begin to breed when about six months old; being very prolific, they bring forth seven times in the year, from four to eight *conies* at a litter, after a gestation of thirty days; and, in the course of six weeks, the young rabbits are able to seek for their own food. The provision of these animals ought to consist of grass, cabbages, carrots, endive, clover-hay, and similar vegetables, which should be given them frequently, in a fresh, though not wet state; and, as soon as the young conies begin to disagree after being weaned, it will be necessary to separate them.

Rabbits are chiefly subject to two disorders, which, if they be not timely attended to, generally prove fatal: 1. The *rot*, which is occasioned by feeding them with too great a proportion of green vegetables, or with such as were gathered before the dew or rain was evaporated. It may, however, be prevented by a strict attention to their food, and especially by mixing a certain portion of clover, or other hay, with green or moist plants. 2. A species of *madness*, which may be ascertained by their restlessness; as these animals roll themselves on the floor of their *hutches*

in an uncouth manner, and hop about in odd postures. Such distemper generally arises from rank feeding, and may be cured by keeping them *low*, and giving them tare, or spear-thistles, the *Carduus lanceolatus*, L.

The usual modes of catching wild rabbits are, by what is called *purse-nets*, and by ferrets; though they are sometimes coursed with small greyhounds, or with spaniels trained up to the sport. Another method consists in *smoking* them out of their burrows, by burning sulphur and orpiment at the entrance. The deleterious fumes of these articles compel the animals to rush into the net spread for their reception; but, as their flesh may thus be rendered unwholesome, and a long time must elapse before other rabbits can be induced to enter the holes, such fetid ingredients ought never to be employed.

CHAP. VIII.

BEES.

ALTHOUGH these useful insects are not generally considered as a part of the farmer's live stock, yet, as they require but little trouble, attention, or capital to begin with, attempts may be made towards rearing them, without risking much, if any loss.

In purchasing bee-stocks, Mr. Keys (in his interesting work on the "Management of Bees,") recommends August as the most proper time; as the bee-keepers (having by the close of that month, selected their best stocks for the next summer's supply) are not disposed to sell but at an advanced price. He further recommends the choice to be made by a skilful person, in a cool evening, or (which is preferable) very early in a cool morning. By tapping about the hive, a tolerably accurate guess may be made, whether it be full of bees and of combs; but the most certain criterion is, to turn those which seem heavy on the edge of the hive, and observe whether the interstices between the combs are crowded with bees, and the combs worked down to the floor. If they be white, or of a light yellow, it is a proof they are of the present year's produce, and fit for the purpose; as a deep yellow or brown colour indicates them to be of

the preceding year's growth, and consequently not so fit; and if they be of a dingy or blackish hue, they will be altogether unfit for a prosperous apiary. As, however, fraudulent dealers sometimes add new borders of virgin wax, (which gives the edges of the comb a light yellow cast) in order to make old stocks, whose combs the preceding year have not been completed, resemble young stocks, it will be proper to look carefully between the combs, as far as the bees will admit; and if the interior part be favourable, form the judgment accordingly. The hive should be poised in the hand; and if it be about half a bushel in size, and weigh 25lb. or upwards, it is an indication of good stock.

The removal of stocks should take place in the evening. Mr. Keys advises the hive to be raised by three or four wedges, some hours before, if the floor be not moveable; otherwise many bees will remain on the floor at the time, and be very troublesome. A cloth should then be laid on the ground behind the hive to be removed: "nimble lift the hive thereon, and, gathering the four corners tight, tie them fast on the top: immediately draw a string close round the body of the hive, to prevent any bees crawling between." They are then to be conveyed in a gentle manner to their place of destination.

The best situation for arranging bee stocks is, towards the south, and in a warm valley near a stream, at a distance from noise and offensive smells. Their produce will also be materially increased by placing the bees in the vicinity of a fine pasturage, whither they can frequently resort in the course of the day, by which means they will be enabled more speedily to fill their hives.

Among the vegetables more frequently visited by these industrious insects, may be mentioned Balm, Bugloss, Bell-flower, Bindweed, Spanish Broom, Sweet Briar, Alder-Buckthorn, Buckwheat, Buttercup, Borage, Lime-tree, Mignonnette, Lupine, Rosemary, Lemon-Thyme, and Heath. Indeed it is remarkable, that in the vicinity of large heaths more honey is produced than in any other part of the kingdom. The honey of bees feeding on heath is very brown, and does not yield such good prices as the finer sorts of honey.

The hives of bees may be made of almost any form and materials: but it has been found that unthreshed rye-straw is preferable to every other material; for which rushes, sedge, or wicker-work may be substituted: the peculiar form of the hive is not of much moment. The hives in common use will answer very well, but they ought to be neatly covered with an upper coating of straw.

There is one advantage resulting from the keeping of bees, which we cannot omit to mention, viz. that their produce in honey, wax, and mead, (where this liquor is made), is almost entirely *clear profit*; as neither rents nor taxes attach upon bees, or bee-hives. "Nor do they (as Mr. Bonner* has justly observed), require a constant attendance as other articles of improvement do: for a proper person might easily oversee, with a little assistance in swarming time, at least 500 bee-hives. And, as Nature has amply provided them with food, and with powers to provide it for themselves, they put their owners to little or no

* Treatise on Bees.

expense for that article, which cannot be said of any other of our servants whatever."

"This useful insect," says Mr. Young,* "is not so much attended to, by many farmers, as it ought to be: not a farm-house should be without bee-hives, as the trouble they give is very trifling; *and by farmers small profits should not be neglected.*"

* Farm. Cal. p. 292.

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Paris, Feb. 9. 1791.

APPENDIX.

I.—ON BRITISH WOOL,

INCLUDING HINTS FOR THE IMPROVEMENT OF ITS
QUALITY AND QUANTITY.

THE importance of the woollen manufacture, both to the commercial and labouring classes of this nation, have long been felt; yet it is only within the last fifteen or twenty years that the subject has been scientifically considered, or any efficient measures have been taken in order to improve the quantity and quality of British wool.

As the protracted extent of the present work will not admit of a detailed account of prejudices which are now daily disappearing, we propose, in the present article, to state the essential properties of wool, and concisely to notice the improvements already made, together with those means which experience and reason evince to be the best calculated for that purpose.

The growth of wool is always completed in one year, at the expiration of which it spontaneously decays, and is naturally renewed. In this respect, indeed, the covering of sheep bears a close resemblance to the hair of most of the lower animals;

though it differs widely in the following particulars: the wool is considerably finer, grows more uniformly, each filament growing at equal distances, and separating nearly at the same time from the skin; and, if not timely shorn, naturally falling off, being succeeded annually by a short coat of young wool. Another peculiarity in wool is, the different degree of thickness which prevails in various parts of the same sheep, being closer at the extremities or points than at the roots, and the part that grows during the winter being of a much finer quality than that produced in the summer.

Various are the names given to wool, according to its state or relative degree of fineness. When first shorn, it is termed a *fleece*; and every fleece is usually divided into three kinds, viz. the *prime*, or *mother wool*, which is separated from the neck and back; the *seconds*, or that obtained from the tails and legs; and the *thirds*, which is taken from the breast and beneath the belly. This general classification of wool corresponds with the Spanish method of sorting into *Rafinos*, or prime; *Finos*, or second best; and *Terceras*, or inferior sort: but the intelligent wool-staplers in the eastern part of this island, distinguish not less than *nine* different sorts that are broken out of small fleeces, the names given to which prove the nice discernment of the persons employed. We have therefore subjoined them for the information of our less-informed readers.*

“No. 1. Is *Short-course*, and very descriptive of its character.

“2. *Livery*, } old sorts, into which the fleece was formerly
 “3. *Abb*, } divided.

* For these interesting distinctions we are indebted to Mr. Luccock's valuable Treatise on “The Nature and Properties of Wool,” 12mo. 1805, p. 142.

“ 4. *Second*.—Probably a second or better *abb*, and the first alteration in the mode of sorting; which arose either from the improvement of fleeces, or in the art of breaking them. This, and all the subsequent names, seem to have been in their regular succession at the top of the list.

“ 5. *Downrights*.—Perhaps intended to convey the idea of superlative perfection.

“ 6. *Head*, or *chief*.

“ 7. *Super-head*.—An advance upon the preceding sort.

“ 8. *Picked Lock*.—First made, perhaps, in small quantities.

“ 9. *Choice Lock*.—Still more excellent.”

Beside these sorts there is another recently introduced into the list, and called *Prime Lock*; which, as its name indicates, is the finest possible that can be obtained.

Till within a few years, the finest wool manufactured in this country was obtained exclusively from Spain: next to Spanish wool, the English sheep indisputably furnish the finest commodity of the kind in Europe. Previously to the introduction of Spanish sheep, the finest and most esteemed sorts of British wool were the Ryeland, South-down, Shetland, Cotswold, and Cheviot fleeces; but by the judicious crossing of Merino rams with the choice British sheep, particularly of the Ryeland breed, wool of the *fourth descent* has been obtained, which, in point of fineness and texture, has proved *equal to the best Spanish wool*. For these interesting facts, the British nation is indebted to the patriotic exertions of Lord Somerville, (who

about eight years since imported from Spain a number of genuine Merino rams at a vast expense), of the British Wool Society, the Board of Agriculture, and Dr. Parry of Bath.* And with the same noble views, his Majesty annually permits some of his Spanish sheep to be sold at reasonable prices, under the auspices of Sir Joseph Banks.

We shall now proceed to state some of the principal requisites, which are indispensably necessary to constitute good wool. These are,

1. *The length of the staple*; for this regulates the various fabrics to which the fleece is destined. Thus, in carding wool, a *short pile*, and a disposition to assume a crumpled, or spring-like shape, is an object of prime importance. This shrivelling quality, Mr. Luccock remarks,† cannot prevail in too high a degree, if it be to make cloths requiring a close and smooth surface; but for cloths where a long and even nap is required, too large a proportion of this curling property he conceives would be detrimental: and consequently a *long pile* or staple will be preferable. Hence, it will be obvious to every attentive cultivator, that wool must be grown for parti-

* The details of the various experiments, conducted by the different public spirited individuals above named, being too numerous for insertion, a few only of their general results can be given. Such of our readers as possess ability, leisure, and inclination to observe the gradual progress that has been made in this national object, will be amply compensated by a perusal of Lord Somerville's "System, followed by the Board of Agriculture," &c. 8vo. 1800; also his lordship's "Facts and Observations on Sheep," &c. 8vo. 1803; the second volume of "Communications to the Board of Agriculture," and Dr. Parry's "Facts and Observations on the Practicability of producing British Clothing Wool equal to that of Spain;" and the ninth volume of the "Letters and Papers of the Bath and West of England Society."

† In his valuable Treatise on "The Nature and Properties of Wool," p. 147.

cular purposes, according to the nature of the manufactures carried on in his vicinity. There is, however, a certain point, beyond which, if this crumpling quality proceeds, the wool becomes less valuable, on account of the superior length of the curves, which render it difficult to break the staple sufficiently. The distribution of the hairs in this staple has been compared to that of the grain in a very crooked piece of timber, or to waved bars of metal, so formed that the convex part of one fits into the concavity of another. As this peculiar property cannot be communicated to wool where it does not naturally exist, breeders of sheep will find it essential to their own interests to unite the valuable properties of wool with those of the carcass.

2. Pliability of wool is another important quality to which the attention of the grower should be directed; as, without this elasticity, it will be unfit for the purposes of manufacture.

3. The peculiar quality, by Mr. Luccock, termed the *felt-ing quality*,* is of equal importance with the preceding, and, though not evident to the eye, is in fact indispensably requisite in all wools which are wrought up into such cloths as are submitted to the action of the fulling mill. Mr. L. describes it as "a tendency in the pile, when submitted to a moderate heat, combined with moisture, to cohere together, and form a compact and pliable substance." This valuable property is possessed in a high degree by the Spanish sheep; and, according to Mr. L.'s opinion, the Cheviot, Morf, and Norfolk fleeces are best adapted for the purposes of fulling.

4. A soft pile is also an essential requisite to constitute a good fleece. In this, as well as in the other properties already

* Treatise on Wool, p. 161.

enumerated, the Spanish wool peculiarly excels: and among the British fleeces, those of Shetland stand unrivalled in this respect.

5. The specific gravity, or relative weight of the pile, is a quality to which the attention of wool-growers has not yet been directed so particularly as the subject requires. In order to ascertain the comparative weight of different samples, Mr. Luccock directs each of them to be brought as nearly as possible to the same degree of purity, to expel all the moisture which wool obstinately retains, and extract all the air contained in the interstices of the staple.*

6. The smell of wool is not a property to which much weight can attach: provided no disagreeable odours are emitted, or any of the effects of moisture are exhibited, Mr. L. considers no one scent to be preferable to another. It is, however, essential that wool should, as far as possible, be perfectly *white*.

7. The last property to which the attention of the cultivators of wool should be directed, in trueness of hair, or a uniform regularity of pile, in which no coarse shaggy hairs are perceptible; as the latter, by reason of their brittle nature, will very materially affect the progress of the manufacturer. Such coarse hairs, as well as kemps or stichel hairs, (which are generally short, brittle, pointed, opaque, and of a grey or brownish cast), are found principally in neglected breeds. Since, however, the art of combining the properties of the parent sheep in their offspring has been generally known, the expert cultivator of wool has been enabled to produce surprising alterations in the relative weight and fineness of wool.

* On Wool, p. 173.

Some instances of what has thus been effected, have already been mentioned in the course of this article.

Various modes of classifying wool-bearing animals have been proposed, according to the particular purposes for which they are reared. The most natural division is, into *long-horned*, *short-horned*, and *sheep without horns*: and this division we have already adopted in the preceding part of this work.* But for *purposes of manufacture*, the quality of wool is obviously the best criterion; and this arrangement is adhered to by a very eminent grazier and wool-grower, Mr. Geo. Culley; to whose valuable observations on live-stock we are indebted for the annexed synoptical table of the different native breeds of sheep.

* *Vide supra.*

A more accurate knowledge, however, may be obtained of the nature of the wool cultivated in different counties, from the following table, in which Mr. Luccock has arranged the *quality of English Wool according to the fineness of its pile.*

CLASS—No. I. Packs.		No. II.	Packs.
York, West-Riding	6678	Cambridge,	1128
— East Do.	6380	Hunts,	2000
— North Do.	5939	Beds,	4520
Westmoreland,	3262	Kent,	7000
Cumberland,	5915	Hants,	7257
Lincoln,	2833	Devon	7280
	—	Cornwall,	3382
	31007	Berkshire,	4151
	—	Oxford,	5303
	No. III.	Bucks,	2787
Essex,	6486	Harts,	5297
Surrey,	3540	Middlesex,	750
Wilts,	8144	Stafford,	1526
Dorset,	9880	Warwick,	2287
Somerset,	9388	Leicester,	291
Gloucester,	5400	Nottingham,	4112
Monmouth,	1431	Derby,	4530
Worcester,	4820	Chester,	926
Shropshire,	4397	Lancaster,	4522
	—	Durham,	3320
	53486	Northumberland,	12333
	—	North Wales,	5692
	No. IV.	South Do.	3570
Norfolk,	5697		—
Suffolk,	5176		93694
Sussex,	9477		—
Hereford,	4200		
	—		
	24550		

THE AVERAGE QUALITY

Of short wool is, 1 inch divided by 871, value 15 <i>l</i> .	
Of short fleeces,	885,
Of long wool,	600, value 13 <i>l</i> .

TOTAL VALUE OF ENGLISH WOOL.

245,290 Packs of short wool, at 15 <i>l</i> .	£3,679,350
137,228 Do. long Do. 13 <i>l</i> .	1,783,964
10,718 Do. lamb's Do. 10 <i>l</i> .	107,180
<hr/>	<hr/>
393,236 Packs.	Total £5,570,484
<hr/>	<hr/>

The Slaughter of short woolled sheep is £4,221,748 per. ann.

Carrion of Do.	211,087
Slaughter of long-wooled sheep,	1,180,413
Carrion of Do.	59,020
Slaughter of lambs	1,400,560
Carrion of Do.	70,028

£7,142,856

The number of lambs yeaned per. ann. is £7,002,802

Annual decrease,	140,054
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£7,142,856

In describing the fleeces of this country, Mr. Luccock* disposes them in two classes, which are mutually distinguished by the length of the staple and the mode of manufacturing them; the one being suited to the fabrication of worsteds, and the other to the making of woollen goods. The sheep from which these different kinds of staple are obtained, do not always run promiscuously in the same flock, or graze upon the same pastures; each being most commonly found upon its appropriated soil, and under a peculiar management. Sometimes the line which separates them is boldly drawn; at others the pastures are so mingled, or the qualities of the land so gradually change from those which are suitable to the heavier sheep, as to give the stock a sort of mongrel appearance, and the fleece an uncertain character. But human genius, always fertile in expedients, has rendered even this defect of the fleece advantageous to the interests of society; and has adapted to it the manufacture of stockings.

Thus, although long wool is found in many detached parts of England, but much more commonly on the eastern than on the western side, and often nearer to the coast than the middle of the kingdom. Sometimes it is produced upon a few acres which are surrounded by land of a different description, and grazed by sheep of another character; these tracts being too small to deserve general attention will be passed unnoticed, and the wool included in the common produce of the district where it grows. Among the larger ranges of long-wool sheep, the first to be noticed, and the most northern, is situated near to the mouth of the Tees, a river separating the bishopric of Durham from the county of York. The second, which may properly be denominated the Lincoln district, comprehends the south-eastern point of Yorkshire, nearly the whole of Lincolnshire, and the fen lands of Huntingdon, Cambridge and

* Treatise on Wool, p. 183.

Norfolk. This kind of wool is found in the smaller marshes of Essex and of Kent which surround the inlets of the sea, but is much more abundant in those of Romney and of Guilford. We meet with it in the counties of Dorset, Devon and Cornwall, upon the Cotswold-hills, in some detached parts of Lancashire, Oxford, Bedford and Stafford, through the whole of Leicester, Rutland, Northampton and Huntingdon, and along the banks of the larger rivers.

But it is remarked by Mr. Luccock, that the short wools of the kingdom do not arrange themselves so distinctly in districts as those of a longer staple do, but fill up the whole space besides that which has been noticed as the pasture of the heavier breeds of sheep. Those families which produce a fleece suitable to the card, though originally possessing features much more strongly characteristic than are found in the other kind, are sometimes so mingled with each other, and with the sheep of the larger fleece, as to render it difficult to determine what particular race many of the individuals belong to. Yet it will be found most convenient to describe them in classes, and to proceed from that county where the species appears most pure, to those where its blood becomes intimately mingled with that of another variety. We know not the period when any of these sheep were introduced into the country, nor whence they were procured, but there remain at present in England and Wales, six different kinds of them, viz. the Norfolk, the South-Down, the Wiltshire, the Ryeland, the Heath sheep, and the Mountaineer; besides some small collections of different varieties, which seem to have descended from families now almost extinct.*

Only two modes, says Mr. Luccock, have yet been adopted for the improvement of fleeces. " One consists in selecting

* Treatise on Wool, p. 137.

those lambs for slaughter which have the least valuable coat; the other, in bringing into the flock male sheep of the most approved breeds, in order that their progeny may perpetuate their best peculiarities.”* It is in fact by the judicious crossing of different breeds with Spanish sheep, that so much has been done towards the amelioration of British wool: and, since this subject has been very ably treated by a neighbouring practical writer,† we have selected the following important principles, founded on actual experience, for the consideration of all judicious wool growers.

1. Every person, who is desirous of having a fine-wooled flock, must select the finest rams that can possibly be obtained, particularly at the commencement of his undertaking, i. e. for the first generation: for, if the ram for the second race is finer than that employed for the first, it is evident that time has been lost in effecting the proposed improvement.

2. In like manner, the finer wooled the ewe is with which the improvement commences, so much the more rapidly will that of the breed arrive at the degree of superfine.

3. The greatest attention is requisite that the rams employed for the subsequent breeds be as fine as the first; otherwise the amelioration will be retarded.

4. Where a breeder is desirous of stopping at a certain degree of fineness, without proceeding any further, he may easily effect this object. It will in such case be sufficient to take a ram and ewe of the first or second race; he will have one half

* On Wool, p. 350.

† M. Fink's Treatise on the "Rearing of Sheep in Germany, and the Improvement of coarse Wool," published (in German) at Halle, 1799.

or three-fourths fine ; and his flock will retain this degree of fineness without any additional improvement.

5. Unless the breeder be minutely attentive to the selection of his rams, the produce of his embraces will have only one-fourth part of the Spanish fineness.

6. If an unimproved ewe be put to a ram of a mixed breed, and which has only one-fourth part Spanish in him, the offspring will only have one-eighth Spanish : by continuing to propagate in this manner, a complete separation of the two breeds will at length be effected.

But Mr. Luccock is of opinion, that flocks might be amended much more rapidly, if, in addition to the common methods above detailed, a kind of barter in lambs were adopted between two neighbouring districts, one of them possessing a superior, and the other an inferior breed of sheep. If these could be exchanged in such a manner that the inferior sorts only should be sent to the markets, while the good ones were preserved, he affirms that the British flocks would annually become more valuable ; as a few seasons would be fully sufficient to dispossess the least cultivated breeds of their present pastures. Our limits do not allow us to notice the objections which he conjectures may be made to this proposal ; but, as it is evidently the result of much reflection and experience, we leave it to the consideration of the attentive reader.

Mr. Bakewell, however, has brought forward some facts and observations, which render it probable that the fineness of wool depends upon the *difference of soil*.* Having early on

* " *Observations on the Influence of Soil and Climate upon Wool,*" &c. 8vo. 1808.—The value of this work is considerably augmented by several important notes communicated to the author by the Rt. Hon. Lord Somerville.

his introduction into the wool business, noticed a remarkable difference in the softness of wools equally fine, but which were produced in different districts, Mr. B. was led to believe "that the herbage of each district derived from the difference of soil some peculiar properties, which gave to it, as the food of sheep, the power of affecting that process of the animal economy by which wool is produced."

"The soils more favourable to this soft quality were, first, the argillaceous; next, the siliceous; and it was well known, that calcareous soils, whether limestone or chalk, produce wools of a contrary quality, remarkable for their harshness to the touch. In proportion as the above earths preponderate in a loose state near the surface of different soils, their effects may be detected, whatever be the breed of sheep from which the wool be shorn."*

These remarks on the effects of chalk upon wool, are limited to chalk alone by Lord Somerville, who considers them as inapplicable to limestone soils in general. "Lime," his lordship observes, "certainly may be burnt from chalk as well as from the limestone: as chalk, it is conveyed into the fleece by contact in its natural state; but limestone, if it does not lie deep below the surface, as is usually the case, is a hard and clean stone, and can communicate nothing to the wool until it is rendered into lime by the strongest effect of fire. This doctrine militates also against the whole of our practice in the western counties. The pile of all my Merino wool, even of the pure blood, is publicly admitted to be improved; it has been grown constantly on a limestone soil, and the surface of the land manured with lime in each course of cropping, and to the extent of 100 bushels per acre of the best popple-lime,

* Bakewell on Wool, p. 5.

the quality of which has been ascertained by Mr. Davy, to whom specimens were sent; it has been treated on in his public lectures, and its quality ranks among the strongest of our manuring lime. As the author speaks so positively on the effect of limestone on wools, we may conclude that the limestone of Derbyshire and the adjoining counties does produce this effect."

Mr. Bakewell conceives that the *soft quality* of wool may be preserved in every situation by *greasing the sheep*; and that the same means will also contribute to counteract the effects of climate and soil, where these are unfavourable to this quality; and further, that sheep will thereby be preserved from cutaneous distempers, from the change of climate, and from the sudden change of temperature after shearing. Mr. B. strenuously advocates the practice of greasing sheep, proving its antiquity as well as its usefulness by details of facts, for which we reluctantly refer to his work, as this article would otherwise be extended beyond our confined limits. The result of his practice, however, may be comprised in the following positions, distinct from the recital of facts by which they are supported. Mr. B. infers,

1st. That hair differs from wool, by the greater degree of hardness and elasticity of its fibres.

2d. That some wools resemble hair in this quality more than other wools which are much coarser.

3d. That the hard quality found in some wool, prevents it from making cloth of the same value as the softer wools, if the former are considerably finer than the latter.

4th. That the application of unctuous matter sufficiently soft and tenacious to cover and remain upon the fleece, will

defend it from the action of the soil, and is found to produce the soft quality of wool, so desirable to the manufacturer.

Hence the greased wools of Northumberland and Yorkshire possess a superior degree of softness to any ungreased wools in the kingdom.

Hence sheep that have received the benefit of this practice, and are driven into other counties not remarkable for soft wools, still preserve the distinguishing softness of their fleece. Hence we learn the reason why ointments, when casually employed to cure some disease of the animal, have also generally been found beneficial to the wool.

If these facts and inferences be admitted, we may also infer, that an improved method of greasing fine-wooled sheep should be adopted in every part of the kingdom, and that it would greatly improve the quality of the wool, and annually save many thousand sheep from perishing by the severity of the weather.*

The same experienced writer recommends the washing of sheep in tubs with warm water, previously to shearing, agreeably to the Swedish practice; which Mr. Bakewell recommends, in order to remove all objections against *greased wools*.

It would be desirable that the Spanish and mixed breeds of sheep were also washed in this way, because it is not possible to cleanse the fleece by the usual practice of immersion in a river, without keeping the animal a long time in the water, and thereby endangering its health. Indeed I do not think the Spanish fleeces can be cleansed by the usual mode of

* Bakewell on Wool, p. 63.

washing, on account of the closeness of the pile. Were the Spanish sheep in this country washed before shearing as clean as the English, the value of their wool would be better ascertained by the wool-buyer, and a more general competition of purchasers would always ensure a fair price for the article.

The extra labour required to wash sheep in tubs with warm water and lie or soda, would, I apprehend, be amply repaid were the water of the first and second washings carried out and applied as a manure. The quantity of rich animal soap it would contain must make it one of the most fertilizing applications which could possibly be used. The greased wool would require a greater quantity of soda to cleanse it than that of the Spanish, or mixed breeds, where no ointment had been applied. I should annex Baron Schultz's account of the Swedish manner of washing sheep: I think some improvements upon it will suggest themselves to the intelligent wool-grower.

“ Before the shearing, the wool with us is almost universally washed upon the sheep. Some persons wash the sheep in the open sea, or in running water, but this is never so clean as when the sheep are first washed in a large tub, with one part clear lie, two parts lukewarm water, with a small quantity of urine; and then in another tub, with less lie in the water; after which the sheep are washed, laying them always on their back, with their heads up, in a tub with clean water; and lastly, there is poured out on the sheep, standing on the ground, a sufficient quantity of water, which is as much as possible squeezed out of the wool. The sheep are afterwards driven into an unpastured adjoining meadow, and remain there (to prevent their soiling themselves in the sheep-house) a day and night, not only till they be dry, which in good dry weather happens within the third day, but also, if bad weather does not threaten, some days longer. Some persons wash

their sheep twice, which I also once tried, but the wool becomes rougher in consequence of it, and in fact of a greyer appearance. The great quantity of grease which the finest Spanish wool contains at the first washing mixes with the lie-water, and makes it quite soft and soapy; but this grease is wanting in the second washing, so that the water is not in the least softened. If the first washing be well performed the wool is by that means several per cent. cleaner than the foreign wool that is imported, which has not been washed after the shearing.*

The inconveniences attendant on the common mode of marking sheep, having already been adverted to in the course of this work, we shall conclude this article by briefly noticing a new method of marking sheep, suggested by M. Lasteyrie. Horses and other cattle, it is well known, are usually marked on the thigh with a red hot iron; but, as this is not practicable on sheep, unless perhaps the iron be applied to the forehead, jaws, or horns of the animal; and even in this case only one common mark can be given to a certain number of sheep. It is, however, essential, that a distinctive mark be given to each animal: with this intention M. Lasteyrie states, that some breeders on the Continent avail themselves of metallic plates whereon the numbers are engraven, and which they fasten with a piece of pack-thread to the neck, or with a piece of wire to the ears of the animal. But, as this method can only be adopted under certain circumstances, and is further liable to many inconveniences, M. Lasteyrie proposes to *make notches* in the ears of sheep, as the most easy and certain expedient.

Where, indeed, a pure, as well as a mixed breed of sheep is reared on the same farm, it will become necessary, in order to avoid mistakes, to distinguish those of the first breed with

* Bakewell on Wool, p. 72.

a different mark from that employed for the sheep of the second breed. In this case, he proposes to apply to the face of the animals an iron, previously made red, and which should be from three to five lines in diameter. Each individual of the flock must next be marked with a number formed by cutting notches in the ears. Two Roman cyphers (viz. I and V) will be sufficient to form a series of numbers from 1 to 199; beyond which number a new series must be commenced, by marking the animals of the second, third, fourth, or other series, with iron tinged with red, and bearing a different impression from that already employed, or by placing such iron on different parts of the face. Thus the most numerous flocks may be numbered with facility.

The marks are formed by cutting the two Roman cyphers on the upper or lower extremity of the ears; though the last is preferable, as the former better protects those organs from the rain, and other severities of the weather. The right ear will have the units, and the left ear the tens. Number I. to IIII. inclusive will designate as many units: a small portion of the ear must then be taken off in this form, V, to mark No. 5; and the subsequent number, to nine inclusive, may be indicated in the following manner:

No. 6, by	VI.
7,	VII.
8,	IV.
9,	IIV.

The marks, which on the right ear denote *units*, will on the left ear signify a corresponding number of *tens*.

M. Lasteyrie* has also proposed another system of numbering sheep; by means of which it would be easy to ascertain by

* Histoire de l'Introduction des Moutons a Laine fine d'Espagne, &c. p. 254.

one glance the genealogy of the individuals. Where a farmer then has a flock, from which he is desirous of raising a breed, the animals may be numbered in the manner already indicated; and each new lamb may be marked on one ear with the number of its mother, and on the other with that of its size. The upper edge or extremity of the ear, would, in this case, serve to designate the units, and the lower the tens. It would further be easy to ascend to the whole series of generations from son to father, by examining the age of each individual from the teeth. This method, M. Lasteyrie thinks, has its advantages, especially where no register is kept of the flock.

The breeder would, however, find it conducive to his interest to keep a register, in which the numbers of each sheep might be marked: here also should be entered such observations (which ought to be carefully made) as not only related to the coupling and crossing of the breeds, but also those experiments he may wish to try upon the animals. A careful cultivator, who is solicitous to improve his art, will, in such register, notice the defects, or other qualities of his sheep, their respective states of health or disease, the nature of their wool, the profit they yield, &c. Thus it will be easy to ascertain what individuals it will be proper to dispose of every year, as well as those from which it will be advantageous to breed: and, at length, the object proposed will be obtained, viz. the improvement of the breeds, and deriving from them the greatest possible profit.

II.—THE DESTRUCTION OF VERMIN.

As the labours of the husbandman are frequently much impeded, and the produce of his fields often seriously injured, by the depredation of rats, weasels, and other vermin, it has

been deemed expedient to annex a few hints on the extermination of vermin of various descriptions that infest farms.

1. *Ant-hills* are very detrimental to dry pastures, not only by wasting the extent of the soil which they occupy, but also by obstructing the free use of the scythe during the season of mowing. The common mode of removing them consists in dividing them into four parts from the top, and afterwards digging sufficiently deep to take out the core below, so that when the turf is replaced it may be somewhat lower than the level of the rest of the land. This will render the spot more moist or wet, and will prevent the ants from returning to their former haunts. In the counties of Herts and Somerset, there is a peculiar sort of spade appropriated to this purpose; the blade of which is extremely sharp, and is so contrived that its whole edge describes three-fourths of a circle. Several ploughs have likewise been invented in different districts for cutting off ant-hills level with the surface of the field: these implements, where they can be commanded, are of great utility, as they will perform the work of many men. But whatever method may be adopted for removing such obstructions, the work ought to be performed in November, or during some part of the winter; because, if the places or spots be then left open and exposed, the frost and succeeding rains will exterminate all ants that may be in the lower part of their habitation. A contrary practice, however, has been recommended by some farmers, viz. the destruction of ant-hills in the month of April, on account of the advantage of sowing grass-seeds immediately on the spot; for which purpose a dressing of manure, in which chalk has been mixed, is recommended to be thrown over it, as tending greatly to accelerate the growth of the grass-seeds. The hillocks which are cut off are directed to be carried away, and, after being thrown into a heap, mixed for some time with chalk or lime. If well turned three or four times during the summer and autumn, it

will make an excellent manure for young grass, to be laid on before Christmas, as well as a good top-dressing for turnips.

The following method, which is also practised in Norfolk, we give from the first volume of Mr. Marshall's "Rural Economy" of that county: "With a heart-shaped spade or shovel, the hills are cut up in irregular lumps, of from ten to fifteen inches in diameter, and from two to six inches thick. The grass sides of these are turned downward until the mould side is perfectly dry, when the former is exposed to the air until the heaps are sufficiently dry to burn. A fire is then kindled by means of brushwood, and kept smothering by gradually laying on the sods or lumps as the fire breaks out, until ten, fifteen, or twenty loads of ashes are raised in one heap. This," Mr. M. observes, "is a cheap way of raising manure, while at the same time it removes a nuisance; and, no man, having such an opportunity in his power, ought to neglect at least the making of an experiment. Ashes are, on some soils, an excellent manure; and perhaps, generally, ashes thus raised would be found highly advantageous as a basis or *bottoming* for farm-yards and dung-hills."

Instead, however, of *cutting* ant-hills, Mr. Young recommends them to be *rolled down*. He states,* that he rode over a large pasture which he should not have known ever to have been infested with these hills if he had not been assured that it once was covered with them.

2. With regard to the removal of *Mole-hills*, various practices are in use; but the most effectual is that derived from the experience of a successful mole-catcher, and communicated to the public by the late Dr. Darwin, in his "Phy-

* "Annals of Agriculture," vol xvi. p. 490.

tologia." This man commenced his operations before sunrise, when he carefully watched their situation; and, frequently observing the motion of the earth above their walks, he struck a spade into the ground behind them, cut off their retreat, and then dug them up. As moles usually place their nests at a greater depth in the ground than their common habitations lie, and thus form an elevation or mole-hill, the next step is to destroy these nests by the spade; after which the frequented paths are to be distinguished from the bye-roads, for the purpose of setting subterraneous traps. This object may be effected by marking every *new* mole-hill with a slight pressure of the foot, and observing the next day whether a mole has passed over it, and destroyed such mark; and this operation should be repeated two or three mornings successively, but without making the pressure so deep as to alarm the animal, and occasion another passage to be opened. Now the traps are to be set in frequented paths, and should be made of a hollow, wooden semi-cylinder, each end of which should be furnished with grooved rings, containing two nooses of horse-hair, that are loosely fastened in the centre by means of a peg, and are stretched above the surface of the ground by a bent stick or strong hoop. As soon as the mole passes half way through one of these nooses, and removes the central peg in its course, the hoop, or bent stick, rises in consequence of its elasticity, and of course strangles the mole. The simplicity of this mode of destroying mole-hills and moles, recommends itself to general adoption, as those whose grounds are thus infested may easily extirpate them, or teach the art to their labourers.

5. *House or Domestic Rats and Mice* are extremely destructive to the farmer, whose interest it becomes to extirpate as many as possible. Among the various expedients suggested for this purpose, the following have been found the most successful.

When a rat or mouse has been caught, cut or beat him severely, and let him go; and he will make such a crying noise, that his companions will desert the place. Some persons, indeed, flea off the skin of their heads; but this method of extermination is too cruel to be recommended to the practice of any humane person:—or, put a piece of fried rusty bacon in the middle of a board, three feet square, and cover the board pretty thickly with bird-lime, leaving some narrow alleys for the vermin to get at the bacon, in doing which they will frequently get among the lime and be caught. In Staffordshire it is customary to put bird-lime about their holes, amongst which they run; and, the bird-lime adhering to them, they will not cease scratching until they kill themselves.—Or, mix the expressed juice of the deadly night-shade with wheaten flour or oat-meal; cut the paste into small pieces, and put them in the holes or tracks frequented by the rats: though they will not eat this nauseous dose, its smell is so exceedingly offensive that they will immediately decamp. Of course, the renewal of this preparation, as often as it loses its odour, will prove an effectual barrier to the return of these vermin. In order to prevent accidents to domestic animals from the poisons usually employed, it has been suggested to place the baits in traps, and to inclose the traps in cases, having holes in the ends of them large enough to admit rats, but small enough to exclude cats, dogs, &c.

For the two following expedients for destroying rats we are indebted to the late Dr. Willich; from whose valuable “*Domestic Encyclopædia*,” (vol. iii.) they are selected.

Among other remedies, he recommends that commonly employed on the continent, where a sponge is fried with salt-butter in a pan; then compressed between two plates, and cut into small pieces, which are scattered about the holes frequented by rats and mice. This preparation is devoured with

avidity ; it excites thirst in the animals, which should be gratified by exposing shallow vessels containing water. On drinking this fluid, after having swallowed the burnt sponge, it distends their stomach, and proves a fatal repast.

“ A capacious cask of moderate height must be procured, and put in the vicinity of places infested with rats. During the first week, this vessel is employed only to allure the rats to visit the solid top of the cask, by means of boards or planks arranged in a sloping direction to the floor, which are every day strewed with oatmeal, or any other food equally grateful to their palate ; and the principal part of which is exposed on the surface. After having thus been lulled into security, and accustomed to find a regular supply for their meals, a skin of parchment is substituted for the wooden top of the cask, and the former is cut for several inches, with transverse incisions through the centre, so as to yield on the smallest pressure. At the same time, a few gallons of water, to the depth of five or six inches, are poured into the empty cask. In the middle of this element a brick or stone is placed, so as to project one or two inches above the fluid ; and that one rat may find on the former, a place of refuge. These preparatory measures being taken, the boards as well as the top of the cask should now be furnished with proper bait, in order to induce them to repeat their visits. No sooner does one of these marauders plunge through the section of the parchment into the vessel, than it retreats to the brick or stone, and commences its lamentations for relief. Nor are its whining notes uttered in vain : others soon follow, and share the same fate : when a dreadful conflict begins among them, to decide the possession of the dry asylum. Battles follow in rapid succession, attended with such loud and noisy shrieks, that all the rats in the neighbourhood hasten to the fatal spot, where they experience similar disasters. Thus hundreds may be caught by a strata-

gem, which might be greatly facilitated by exposing a living rat taken in a trap, or purchased from a professional rat-catcher."

3. *Field Rats and Mice*.—Go out in the dog-days, when the fields are tolerably bare; and having found their nests or holes, (which in shape and size resemble an augre-hole), put therein hemlock-seed, or helebore, mixed with barley, of which they will eat so as to destroy themselves. As these vermin frequently consume seed-corn after it is deposited in the ground, it has been suggested to steep it in bull's gall, which will impart to it such a bitter taste that they will not touch it. Some persons mix sand with their corn, which deters them from burrowing in it, by falling into their ears. The following method has been found very effectual: Fill an earthen pot half full of water, and cover it over with a board that has a hole in the middle, then cover the board over with straw, pea-haulm, or similar rubbish; under which the vermin will take shelter, and, creeping to the hole, will fall through and be drowned in the water.

4. *Weasels*, though in some respects beneficial, inasmuch as (when domesticated) they destroy rats, mice, moles, and other noxious vermin, are nevertheless, in a wild state, formidable foes to poultry and rabbits. They may be destroyed by putting in their haunts small pieces of paste, consisting of pulverized sal-ammoniac, mixed up with the white of an egg, wheaten flour, and honey. The strewing of *rue* round the place where hens lay, is also said to drive away these depredators; so also will the smell of a *burnt cat*; as all animals are terrified at the burning of one of their own, or of a similar species.

5. *Caterpillars* are very destructive in gardens and fields, especially those denominated the black, and the black-canker caterpillar, which prey principally on turnips. The former

insect is of the colour of soot ; and, when full grown, about three quarters of an inch in length. It commences its depositions towards the end of August, or the beginning of September, and is particularly numerous when the north or easterly winds prevail. To counteract the devastation occasioned by this insect, it has been recommended at the first ploughing, to irrigate the furrows with lime-water, which will effectually destroy it, as few insects like the smell of any thing that has been burned.

The black-canker caterpillars are principally found in the county of Norfolk, where, from the great number of insects which have been washed upon the beach by the tide, it is generally believed that they are not natives, but wafted across the ocean. These cankers are supposed to be the caterpillar state of the yellow fly, which is particularly destructive in fields planted with turnips and cabbages ; for they have been observed regularly to assume the appearance of those flies. For this evil, there appears to be no other remedy but to pull the creatures off their nests, and to watch the flies which, during the hot weather, are daily depositing their eggs on those plants.

Mr. Coke, of Holkham, in 1784, purchased 400 ducks, and turned them on thirty-three acres of turnips, which they effectually cleared of the canker-caterpillar in the course of five days. There is no doubt but that on a small farm a less number might be advantageously kept for this purpose.

There is also another variety, called by gardeners the grub, the skin of which is very tough, and of a brown colour. This insect is particularly injurious, usually depositing its eggs in the very heart of the plants, through all the blades of which it eats its way, leaving behind a great quantity of its excrement, which is hurtful to vegetation: Grubs likewise

burrow under the surface of the ground, and do great damage to young plants, by eating off their tender stalks, and drawing them into subterraneous holes. This mischief is principally done in the night; but if the earth be stirred about an inch deep, where a plant is found to be thus injured, the insect will be discovered: and this is the only certain way of exterminating these noxious vermin.

When caterpillars attack fruit trees, the most efficacious way to destroy them is the following:—Make a strong decoction of equal quantities of rue, wormwood, and common tobacco, and sprinkle this liquor on the leaves and young branches every night and morning, while the fruit is ripening.

Various other experiments have been made with a view to extirpate these mischievous vermin. We shall, however, mention only the following methods, which have been attended with peculiar success:—Take three quarts of water, and one quart of vinegar; let them be heated till they nearly boil; then put one pound or more of pure soot into the mixture, and stir it with a whisk till the whole is duly incorporated. Sprinkle the plants with this preparation every morning and evening: in a few days all the caterpillars will disappear.—This has also been effected by sprinkling plants (and more especially gooseberry-bushes, which are remarkably subject to the depredations of these insects) with a preparation consisting of one quart of tobacco-liquor, in which one ounce of alum has been dissolved. As soon as the plants or bushes appear to be in the least corroded, or any eggs are observed on the leaves, a brush should be dipped into the liquor, which, by drawing the hand gently over its hairs, is carefully sprinkled on them. If any eggs be there deposited, they never come forward after this application; and if those eggs have already been changed into worms, they either die or sicken so

as to fall off the bush, in which case they may be easily killed.

When the trunk and boughs of trees abound with the eggs of caterpillars, especially in the early spring, it is advisable to rub the bark of all the affected places, with a sponge dipped in soap-water; and, where the height of the tree renders it necessary, this operation may be facilitated by fastening pieces of flannel to a lath or pole, after soaking them in a similar manner.

The following excellent observations upon the means of preventing the effects of caterpillars on fruit-trees, are by W. HAMPSON, Esq. of Philadelphia, North America.

“ Some time ago, having an intention to improve a number of apple-trees, which, owing to their being yearly infested with the caterpillar, had been long neglected, I began in the following manner: It being early in the spring, I first caused the thick brown moss to be removed from the trunk of the tree, around which, but at a distance equal to the extremities of the roots, I spread warm rotten litter; and then, with the back of a pruning-knife, scraped off the liver-coloured moss with which the branches of the tree were entirely encrusted. But what surprised me, and to what I would beg particular attention, was, that small detached pieces of moss hung upon the bough by fine threads after it had been cleaned: this led me to think they belonged to some eggs, or insects, which lay concealed between the moss and the outer bark, or between the outer and the inner rind; but being then without the help of glasses, my curiosity remained unsatisfied, although the effects discovered in the opening season justified my strongest apprehensions; for those trees which had been thoroughly cleaned, put forth strong and healthy shoots, and retained their leaves; when others, their neighbours, were eaten up; yet,

what convinced me beyond the least doubt was, a tree, which, through negligence, had been left in part cleaned: the boughs which I had cleaned were untouched by the caterpillar; on the contrary, the leaves of those boughs I had not cleaned were soon consumed by them.

“ These facts being stated, the following remarks are naturally suggested: First, that the eggs of the caterpillars lie, during the winter, concealed in such trees as are overgrown with moss, between the moss and the rind, or, where the rind is decayed, in the cavities occasioned by such decay; a circumstance which, with the assistance of the microscope, I have since ascertained: but, through mere neglect, having not preserved the eggs for future observation, I cannot say, determinately, they were the eggs of the caterpillar; but this I can say, that the removal of those eggs prevented the leaves of the tree from being eaten. Secondly, that the proper time for destroying them would be before the eggs are hatched; for, by the time the caterpillar is come out, the buds begin to open, and of course become its immediate prey; and as the butterfly tribe are so numerous, and so perfectly free from restraint, the nature of the case will require an annual search to be made in such places as are thought favourable to them for depositing their eggs: there will be often found full-grown trees which, by being encumbered with branches, the power of the sun is not admitted to shrivel the old rind as the new one is forming; consequently such trees become encrusted with decayed coats, the fit receptacles for preserving the embryo caterpillars; and such trees whose wounds have been suffered to heal, so as to form an hollow, retaining moisture, which cankers the wood, and renders it easily perforated by the fly, are likewise liable to become a prey to the insects they have preserved.”

6. *Snails* are very mischievous to gardens, particularly to wall-fruit; and though immense numbers are preyed upon and devoured by other numerous insects, yet they often become so numerous as to require effectual measures for their destruction. With this view it has been recommended to strew the ground with lime and ashes: but the best and most certain method is, to close every crevice in walls as soon as the snails appear in damp or cloudy weather, and afterwards collecting them by the hand; by which means, in the course of two or three years, they will be completely exterminated.

7. *Slugs* are likewise great depredators on turnips; for extirpating which, some have recommended the rolling of the ground during the night, while these vermin are abroad; as also the strewing of the lime in the evening, at the rate of fifteen bushels per acre. Geese and ducks may, as in the case of the canker, be advantageously turned into turnip fields: but the most expeditious means of destroying these vermin is the sprinkling of tar-water, by means of a watering-pot, or other contrivance, on the land, before as well as after the sowing, which will prevent their depredations; and which, if poured on them, will occasion instantaneous death. Capt. Shank* directs the tar-water to be made by pouring a sufficient quantity of tar into a barrel, and to fill it up with water, which, after standing two or three days, will become powerfully impregnated with the tar.

8. The *fly*, or *black-fly*, ravages chiefly the tender seed-leaves of young turnips, and, if not timely prevented, will completely destroy them. The sowing of turnip-seed between beans has been suggested as a preventive; as also as the addition of one-fifth part of radish-seed, rolled into the ground.

* Shank in "Bath Papers," vol. viii:

Radish-seed, however, is not in all cases a preventive, though we understand a Norfolk cultivator, some time since, received a handsome sum for divulging this remedy: for we have been informed, that Mr. Dunning of Blackwater, Hants, (deceased), late an eminent coach-master on the western road, and also an intelligent cultivator, tried the experiment of radish-seed on seven acres of turnips, which were almost totally destroyed by the fly; while a contiguous field, which he had sown with turnip-seed and sulphur, escaped altogether unurt. The proportion of flour of sulphur we would recommend, from experience of its good effects, is three ounces to one pound of seed, to be added in the following manner: put the seed and one ounce of sulphur into a glazed earthen vessel, and cover it closely down for twenty-four hours; at the end of that time, stir the mixture, and add a second ounce, covering it as before; and at the end of forty-eight hours, mix the third ounce, carefully stirring the whole, that the seed may be properly impregnated with the sulphur. It is then to be sown in the usual manner, and will effectually keep off the vermin till the third or fourth seed-leaf is formed, which will acquire a bitter taste, and thus be secured from the ravages of the insect. Another efficacious remedy, which was adopted by the late Lord Orford, is the steeping of the seed in train-oil the night before it is sown;* but, in this case, the seed should be drained from the oily fluid, and mixed with finely-sifted sand, or mould. By this treatment the roots will not acquire any ill flavour; and seven gallons of oil, will, it is said, be enough to steep seed for sowing 200 acres. It is probable that this steep may prevent the attacks of the black-canker caterpillar.

9. *Pole-Cats* may be caught and destroyed by a dead-fall, constructed in the following manner. Take a square piece of

* Annals of Agriculture, vol. xiv.

wood, weighing forty or fifty pounds : bore a hole in the middle of the upper side, and set a crooked hook fast in it; then set four forked stakes fast in the ground, and lay two sticks across, on which sticks lay a long staff, to hold the dead-fall up to the crook; and under this crook put a short stick, and fasten a line to it: this line must reach down to the bridge below; and this bridge you must make about five or six inches broad. On both sides of this dead-fall, place boards or pales, or edge it with close rods, and make it ten or twelve inches high.—Let the entrance be no wider than the breadth of the dead-fall.

The pigeon-house should, if possible, be surrounded with a wet ditch, and that will tend to preserve the pigeons; for beasts of prey naturally avoid water.

10. *Badgers*.—These creatures destroy great numbers of young pigs, lambs, and poultry every year. Some use a steel-trap, or a spring, such as foxes are taken in, to catch them.

Others sink a pit-fall, five feet in depth, and four in length, forming it narrow at the top and bottom, and wider in the middle; they then cover it with small sticks and leaves, so that the badger may fall in when he comes on it. Foxes are sometimes taken in this manner. Others, again, pursue a badger to his hole, and dig him out; this is done by moon-light.

11. *Foxes* commit great ravages among lambs, poultry, geese, &c.—To destroy them, the farmer must take a sheep's paunch, and fasten it to a long stick; then rub his shoes well upon the paunch, that the fox may not scent his feet. He should then draw his paunch after him as a trail, a mile or upwards, till he gets near some large tree; then leave the paunch and ascend into the tree with a gun; and as the night comes on, he may see the fox come after the scent of the trail,

when he may shoot him. The trail should be drawn to the windward of the tree, if he can conveniently contrive so to do.

Set a steel-trap in the plain part of a large field, distant from paths and hedges; then open the trap, place it on the ground, cut out the exact shape thereof in a turf, and take out just so much earth as to make room for it to stand, and then cover it again very neatly with the turf you cut out.—As the joint of the turf will not close exactly, procure some mould of a mole-hill newly thrown up, and stick some grass in it, as if it grew there. Scatter some mould of the mole-hill very thin three different ways, at the distance of ten or twelve yards from the trap; let this mould be thrown on spots fifteen or sixteen inches square; and where the trap is placed, lay three or four small pieces of cheese; and then with a sheep's paunch draw a trail a mile or two long to each of these three places, and from thence to the trap, that the fox may approach one of these places first: for then he will advance to the trap more boldly; and thus you will be almost always sure of catching him. You must take care that your trap be left loose, that he may draw it to some hedge or covert, or he will bite off his leg, and so make his escape.

Near the spot where a fox uses much to resort, fix a stick or pole, much in the same manner as for a woodcock. To explain this more exactly: Tie a string to some pole set fast in the ground, and to this string fasten a small short stick, made thin on the upper side, with a notch at the lower end of it; then set another stick fast in the ground, with a nick under it; bend down the pole, and let the nicks or notches join in the slightest degree: then open the noose or string, and place it in the path or walk of the fox. By strewing flesh-meat, pieces of cheese, &c. as you pass along, you may entice the fox to take the same road.

When a farmer wishes to shoot one of those animals, he should anoint the soles of his shoes with swine's fat, a little broiled; then go towards the wood, and, on his return, drop here and there a bit of swine's liver, roasted and dipt in honey, drawing after him a dead cat; and by these means he therefore will be allured to follow him.

The fox is sometimes taken with a hook, made of large wire, and turning on a swivel like the collar of a greyhound. It is usually hung so high from the ground, that he is compelled to leap to catch at it; and baited with flesh, liver, cheese, &c. and if a trail be run with a sheep's paunch, as before directed, he will be drawn to the bait with the greatest ease.

12. *Kites*.—Near the place where poultry are kept let iron gins be fixed, about four inches broad, which must be baited with chicken, mice, or raw meat; and thus these ravenous fowls are easily taken. Some persons stretch lines or nets over the place where the fowls are; but nothing drives them away like a well-charged gun. Or, steep the entrails of pigs, fowls, or rabbits, in the lees of wine, into which you have infused a quantity of *nux vomica*, and throw the bait where the fowls come in the evening, or early in the morning. This will intoxicate them so that a person waiting near the spot may easily take them.

III.—ON THE CHANGES OF WEATHER,

As indicated by various Phenomena.

As the state of the weather not only influences the health of mankind, and also of the brute creation, but likewise materially affects the labours of the husbandman, the editor conceives that it will not be altogether useless to conclude the present work with some hints, founded on experience, relative to the ascertainment of the different changes of the weather; more particularly, as an occasional reference to these remarks may afford the farmer some guide in directing the diversified operations of the field.

Among the various phenomena which attentive observers have found to indicate approaching changes in the atmosphere, the following may be selected as affording the most certain signs.

I. *By animals.*—1. Previous to rain and wind, or stormy weather, *neat cattle* and *sheep* seem more than usually desirous of feeding in their pastures, and to leave them with reluctance. Further, if, in summer, sheep rise early in the morning, it is a sure sign either of rain or a very hot day: and in all seasons if they frisk about, it indicates both rain and wind in summer; and in winter, stormy snowy weather. Wet weather is also announced by the uneasiness of *swine*, which grunt loudly, and retire to their sties; by *geese* and *ducks* washing themselves repeatedly and with little intermission, flying anxiously backwards and forwards; by *swallows* flying low and skimming along the surface of the water, twittering with more loudness than usual; and by *poultry* rolling much in dust and sand, or gravel. Wet and windy weather is like-

wise indicated by *dogs* becoming drowsy and stupid, and exhibiting an evident reluctance for food, except grass, (particularly the species denominated dog's-grass, or couch-grass); and by *cats* losing their vivacity, and remaining within doors. *Continued rain* is announced by *pigeons* returning slowly to their cotes; a change from cloudy or unsettled to greater wet, by *flies* stinging and swarming more than usual; and a sudden variation, accompanied with a storm, by *wild-ducks*, *plovers*, *bustards*, and other *aquatic birds* withdrawing to the sea-coasts, or to the marshes.

The contrary circumstances evince the longer or shorter continuance of fine weather; to which may be added, that *bees* flying abroad, and labouring with that industry which has become proverbial; *crows* croaking in the morning; the *robin* or *red-breast* singing early from the more elevated branches of trees; and *gnats* flying in a columnal form, within the rays of the setting sun, are all indications of fine or serene weather.

To these remarks we subjoin the following hints, for which we are indebted to the author of the "Experienced Farmer."

"In winter, if the sheep lie under a hedge and seem loth to go off to pasture, and bleat, it is a sign of a storm.—If rabbits get out to feed early in the evening, it is a sign of rain in the night in summer, and of either rain or snow in winter; and when it is likely to be a bad night, they will be apt to get home before it is dark.—If owls screech in the night, it is a certain sign of rain, and mostly in a very short time.—When woodpeckers cry, it is a sign of rain. For this reason, in some places they are called rain-fowl. Also when peacocks cry it is a sign of rain.—If the cocks begin to crow while it rains, this is a sign of fair weather.—When sheep are fed with hay in winter, and

in frosty and snowy weather they leave their hay, it is a certain sign of the frost's breaking up.—Before a wet summer, the swans build their nests very high; but before a dry summer they build very low. And the butter-bump does the same.—In the time of hay-making, if the black snails are to be seen stretched along on the swarths of grass, it is a sign of rain.—When frogs look black instead of yellow, it is a sign of rain.—When the raven is observed early in the morning soaring round and round at a great height in the air, we may be sure the day will be fine, and the weather is likely to set in for fair.—In summer, when the dor-beetle is seen flying about in the evening, the next day is likely to be fine.—When the bat is observed flying about very late in the evening, the next day is likely to be fair.—When the swallow is observed to fly high, the weather will most likely be warm and fair. But if it is observed to fly low, and dip the tip of its wings in the water as it skims over the surface, the weather is likely to be rainy.—The continued hoarse squalling also of Guinea-fowl, the quacking of ducks and geese, and the loud croaking of frogs, are sure signs of rain.—When bees do not go out as usual, but keep in their hives, it is a sign of rain.—When there is much honey-dew on trees and plants, this is a sign of hot weather.—Before great storms, the missel-thrush sings particularly loud, and continues to do so till the rain begins. For this reason, in some places it is called the storm-fowl.—Pigs appear very uneasy before high winds, and run about squeaking as if they were in great pain.—In autumn, when flocks of wild-geese are observed to fly over in a westerly direction, it is a sign there will be hard weather.”*

II. *From the appearance of the earth.*—Thus moist stones and dry soil prognosticate rain; a continued fall of which may be expected, if the ground seem nearly dry, and the roads

* Parkinson's Experienced Farmer, vol. ii. p. 320.

almost, if not wholly, free from mud; as the contrary occurrences announce, that the evaporation of humidity has ceased, and consequently that fine weather is approaching.

III. *From the atmosphere.*—If in the evening a white mist be spread over a meadow, contiguous to a river, it will be evaporated by the sun's rays on the following morning, and is an indication of fine weather throughout the day; so in the morning, if a mist, which is impending over low lands, draw off towards those which are more elevated, it announces a fine day. The gradual diminution of clouds, till they can be no longer seen in the air, is a sign of fine weather; so likewise does the continuance of abundant dew upon the grass after a serene day. The contrary events announce a change of weather, which may be more clearly known by the clouds gathering and lowering; by the sky, after serene weather, becoming undulated as it were with small clouds. During winter, if the clouds appear not unlike fleeces, i. e. thick and close in the middle, and very white at the edges, the surrounding sky being remarkably blue, they indicate hail or snow, or cold chilling showers of rain. Farther, where the clouds appear moving in two opposite currents, and the lower current is wafted rapidly before the wind, it is a certain sign of rain; and, if they occur during summer, or generally in hot weather, they announce thunder-storms. If the rays of the *sun* break through the clouds, and are visibly dazzling in the air, the latter is loaded with vapours that will speedily descend in showers of rain. At all times, when the clouds look *black* in the west, it is a sure sign of rain; or, if it rains, it will certainly continue, in whatever quarter the wind may blow. On the contrary, fair weather may be expected, if the clouds break in the west. Thunder is mostly preceded by hot, and followed by cold and drizzling, or showery weather. Frequent variations of the wind to the different points of the compass evince the speedy

approach of rain, particularly if it *whistle* or *howl* in its course through the atmosphere. The west wind is usually damp, on account of the vast quantity of vapours it collects in its progress over the Atlantic Ocean; the south wind, which blows from the torrid zone, is the warmest of the four, as the north wind is the coldest, while the east wind is the most dry; but, if rain fall during the prevalence of an easterly wind, it may be expected to continue, with little intermission, for four-and-twenty hours. Lastly, if there be mists at the new moon, there will be rain in the old; as, on the contrary, if there be mists in the latter, there will be rain in the next new moon.

IV. *From the seasons.*—1. A moist autumn, followed by a mild winter, is usually succeeded by a dry and cold spring, in consequence of which vegetation is materially retarded: such a spring occurred in 1741.—2. Should the summer be unusually cold and wet, the ensuing winter may be expected to be extremely cold; for the heat or warmth of the ground will be dissipated or carried off, in consequence of such unusual evaporation.—3. Very wet summers are mostly attended with an increased quantity of seed on the dog-rose and white-thorn bushes; so that the uncommon fruitfulness of these shrubs may be regarded as a certain indication of an intensely cold winter.—4. A severe winter is uniformly predicted by cranes and other birds of passage migrating early in autumn; for these creatures never take their flight southwards until the cold season has commenced in the northern regions.—5. Should the last eighteen days of February and the first eight or ten days of March be chiefly wet, a rainy spring and summer may, in general, be expected.—6. If frequent showers fall in September, it seldom rains in May; and the reverse. So there usually falls less rain in April than in October, in the proportion of one to two; in March than in November, in the proportion of seven to twelve.—7. On the contrary, should the wind blow from the

south-west during either summer or autumn, and the air be uncommonly cold for those seasons, a profuse fall of rain may be speedily expected.—8. A kind of crisis takes place in the atmosphere after great storms, rains, or similar violent commotions of the clouds, so that they are for some months attended with a regular succession either of bad or of fair weather.—Lastly, a cold and rough autumn prognosticates an intense winter; as the latter season, when rainy, is mostly succeeded by an unproductive year.

For the preceding remarks we are chiefly indebted to an interesting tract (which in fact every farmer should possess), entitled “The Farmer’s and Gardener’s Directory, containing the most approved Rules and Directions for foretelling the Changes which take place in the Weather, &c.” We shall conclude these hints respecting the atmosphere, with the following rules laid down by Mr. Kirwan, from observations which had been made in England, from A. D. 1677, to 1789, during a period of 112 years.

1. When no storm has either preceded or followed the vernal equinox, the ensuing summer is generally dry, or at least so five times out of six.
2. If a storm happen from an easterly point on the 19th, 20th, or 21st days of May, the succeeding summer will also be dry four times in five. A dry summer will likewise follow if a storm arise in any point of the compass on the 25th, 26th, or 27th days of March.
3. Should there be a storm either at south-west, or west-south-west, on any day from the 19th to the 21st of

March, the ensuing summer will be wet five times out of six.

In England, if the springs and winters be *dry*, they are generally *cold*; but if *moist*, or *humid*, they are usually *warm*; whereas, *dry summers* and *autumns* are mostly *hot*; as, on the contrary, *moist summers* are *cold*. Thus, if the moisture or dryness of a particular season be ascertained, an idea may be formed with tolerable precision respecting its temperature; and the farmer, by attending to the various indications of the weather, will be enabled to provide accordingly for the exigencies of his cattle stock.

INDEX.



A

- AFTER-BIRTH**, necessity of watching the discharge of this excrement closely, 44. Best method of promoting its evacuation, *ib.*
- Age of cattle**, 16, 72, 73.
- Alderney breed of cattle**, description and valuable properties of, 29, 30.
- Anderson, Dr.** his valuable practical remarks in selecting cattle to breed from, 34.
- Animals**, from which sort best to breed, 58.
- Ant-hills**, methods of destroying, 198, 199.
- Asses and Mules**, directions respecting them: their uses, &c. 150, 151.

B

- Bakewell, Mr.** the most celebrated of the modern professional breeders of cattle, 11. His principles, *ib.* 12. His opinion of the proper time for sending cows to bull, 38. His improvement and commendation of the Dishley breed of cattle, 27. Of sheep, 75.
- Bakewell (Mr. jun.)** observations on wool, 190, 191. Recommends the *greasing* of fleeces, 192. Advantages of this practice, 193.
- Barrenness in cows**, observations on, 40.
- Beasts**, big-boned, former prejudice in favour of, now rejected, 12.
- , tame, require less food to rear or support them than others, 13.
- Beauty of shape**, necessary to be attended to, in selecting cattle, 11.
- Bees**, directions for management of, 172—175.
- Beestings**, explanation of the term, 44.
- Black cattle**, general observations on, 21. Age of, how to ascertain, 72, 73.
- Black-fly**, how to exterminate, 208, 209.
- Boys', (Mrs.)** successful method of rearing poultry, 159, 160.

- Breeders, modern professional, their new and valuable improvements in the science of rearing cattle, 12.
- Breeding of cattle, strictures on, by Dr. Anderson, 34, 35.
- Budd, Mr. in America, his method of raising calves, 56.
- Bull, qualities essential to constitute a perfect, 21. When attaining the age of puberty, 22. Generally lives like the ox and cow, about 14 years, *ib.* His natural disposition naturally vicious, how remedied, *ib.* 23.

C

- Calf, its proper position in the uterus, 41.
- Calf-stage, description of one used in Gloucestershire, 55.
- Calves. Methods of feeding calves, 44. Which most preferable, *ib.* Prevented from injuring the mother in suck by a muzzle, 45. Necessity of supplying them with a good pasture, *ib.* Best time for weaning them, and mode of treating them, *ib.* Frequent difficulty in teaching them to drink, *ib.* note. Subsequent treatment till they are able to feed themselves, 46, 48. Time of weaning them in Suffolk, 49. Their treatment in the northern countries of England, *ib.* Method of rearing them in Cumberland, 34. Contrivance to prevent them from licking themselves, 50. Manner of feeding them in Norfolk, 51. How reared in Holland, 52. Importance of regularity in feeding them, 54. Treatment of, after they have been dropped, 44. Necessity of observing cleanliness, 54. Remarks on the practice of breeding them, 56. Treatment of those intended for the draught, *ib.* Best time for castrating male, or spaying female calves, *ib.* Time and method of performing this operation, *ib.* Treatment subsequent to it, 57. Mode of exterminating their horns, 57, 58.
- Calving, management of the cow after, 41. Care necessary to be taken during this operation, *ib.*
- Cannock-heath breed of sheep, 80.
- Castration of lambs, proper time for, 99, 100.
- Caterpillars, how to destroy, 203—207.
- Cattle, wild, specific character of, 23. Where now only found, *ib.* Directions for the farmer from what sort of grounds to buy them, 13, 14. Importance of its improvement by selecting and breeding from such as unite to beauty of form a kindliness of skin, &c. 32. Long-horned or short-horned, which to be preferred, 32, 34.
- Dutch, or short-horned breed, specific characters and qualities of the, 26. Their resort in England, *ib.*

- Cattle, Lancashire breed, specific characters, advantages and disadvantages peculiar to it, 27. Where reared, *ib.*
- Herefordshire breed, characters and advantages of, 25.
- black, general remarks on, 21. Time of casting their teeth, *ib.*
- remarks on the sale and weight of, 126—132.
- Table of their prices, 133, 134.
- remarks on purchasing, 10, 11. The importance of beauty or symmetry of shape in, 11. Working proportions essentially necessary for, *ib.* Other requisites, 14—18. Improvement of their form, 19.
- manner of managing them so as to make them thrive more in three years than they usually do in five, 14. Small breed the best for fattening, 12, 13. From what soils to be purchased, 13.
- Dunlop, characters of, 30.
- Dishley, a variety of the Lancashire breed, 27. Its valuable properties, *ib.*
- Galloway, or polled, its specific characters, 29. Peculiar advantages, &c. *ib.*
- Highland breed, its specific characters, 29. Well adapted for cold climates, properties, &c. *ib.*
- Kyloes, *see Highland breed.*
- Alderney or French, specific characters, 29.
- Lowland, a mixed race, between the Kyloes and Galloways, 30. Sussex, 25.
- Welch, characteristics, qualities, &c. 30.
- Irish, characteristic of the, in what counties most abundant, 31. Its improvement by the breeders, *ib.* Remarks on the two varieties, the long-horned and the short-horned, 32.
- Chest of Cattle, remarks on, 17.
- Clift, Mr. his practice of rearing calves, 53.
- Cline, Mr. strictures of, on the internal form of cattle, 16. Strictures on the improvement of form, 19, 20.
- Colts, proper management of, 140, 141.
- Constitution of cattle should be hardy, 13.
- Cooper, Mr. his method of exterminating the horns of calves, 57.
- Cotswold breed of sheep, 77.
- Cow, the Alderney, its many valuable properties, 19, 20.
- Dunlop, the produce of a cross of Alderney cows with Fifeshire bulls, 20. Its estimable qualities, *ib.*
- Holderness, the, chiefly met with in the vicinity of the metropolis, 36.

Cow, Jersey, see *Alderney*.

— qualities requisite in a perfect, 36. Those which yield abundance of milk never feed quickly, 37. The black supposed to be best for breeding refuted, *ib.*

— when supposed to arrive at the age of maturity, 38. Proper time for her taking the bull, 39. The best season for her going to bull, and subsequent management, *ib.* The desire of obtaining numerous calves how best accomplished, *ib.* Period of gestation, 40. Propriety of turning her into sweet grass before calving in spring, and feeding her with the best hay in winter, *ib.* Necessary management after calving, 41—43. Great attention necessary when she has slipped her calf, *ib.* Her inclination to clean the skin of her calf, 42—44. How still more facilitated, *ib.*

Crossing the breeds, strictures on, 20.

Crook, Mr. his mode of rearing calves, 49, note.

Culley, Mr. his reasons for giving the preference in general to the long-horned Irish ox, 31, 32.

— Mr. his remarks on the dentition of sheep, 114.

Curran, Mr. his method of marking sheep, 195.

D

Dartmoor or Devonshire breed of sheep, 78.

Destruction of vermin, observations on, and remedies for, 197—212.

Devonshire breed of cattle, characters of, 24.

Dishley breed of cattle, 27. Of sheep, 75.

Docility of disposition in cattle, of moment in the purchase, 13.

Docking, opinions for and against this practice, 112.

Dogs, 154. Shepherds' dog, *ib.* 155. Cur dog, 155. Prussian method of breeding dogs, 156, 157.

Dorsetshire breed of sheep, 83.

Doyley, Mrs. her successful method of rearing poultry, 160—162.

Ducks, breeding and rearing of, 168, 169.

Dun-faced breed of sheep, 82.

Dunlop breed, characters of, 30.

Duns, Suffolk, a variety of the Galloway ox, 30. Their excellent qualities, *ib.*

Dutch breed of cattle, characters of, 26.

E

- Early maturity, importance of, in live stock, 14.
 Ellman, Mr. his method of shearing sheep, 103.
 Ewe, account of one uncommonly prolific, 93, note. Choice of, for breeding, 92.
 Ewes, attention to be paid to them in rearing young lambs, 94—96.
 Exmoor breed of sheep, 83.
 Expense, comparative, of keep, and general savings in respect to oxen and horses, 64—72. Superiority of the former, *ib.*
 External form of cattle, observations on, 11—16.
 Eye, the, formerly the criterion to judge of the qualities of a beast to be purchased, 10.

F

- Fallows, their almost total banishment by Count de Magnis, 106.
 Flesh of cattle, best sign of its good quality, 12.
 Fly, how to prevent from destroying turnips, 208, 209.
 Form of cattle, external, strictures on, 11—16. Internal form, 16—19.
 Improvement of, 19, 20.
 Fowls, breeding and treatment of, 158—169.
 Fowler, Mr. his extraordinary stock of cattle, 33, and note. His endeavours to improve the British cattle, *ib.*
 Foxes, how to catch and destroy, 210—212.
 France, manner of working oxen by the head there, 62. Method of shearing, 104.
 Free Martins, why some cows are so demominated, 40.

G

- Galloway cattle, description of, 28. Galloway method of rearing calves, 44.
 Geese, breeding and rearing of, 167, 168.
 Gloucestershire method of rearing calves, 55, 56.
 Grey, Mr. his recommendations respecting the fattening of cattle, 14.
 Guinea-fowls, breeding and rearing of, 163, 164.

H

- Hardiness of constitution, a most important point to the farmer in supplying his farm with live stock, 13.
 Hay-tea, manner of preparing it, 47, 48. Quantity given at each meal, *ib.* Further diet to be observed on this occasion, 48, 49.

- Heads of cattle, observations on the form of, 18
- Heath, or Linton breed of sheep, 85.
- Herdwick breed of sheep, 81.
- Herefordshire breed of cattle, characters of, 25. Of sheep, 78.
- Hide of cattle, the, its touch sufficient to point out the kindliness to fatten, 15.
- Hog, characteristic marks of a good, 118.
- Berkshire breed, specific characters, and fineness of its flesh, 119.
- Chinese, specific characters, and profitable qualities, 120.
- Black breed, *see Chinese*.
- Gloucester, specific character, 120. Not so profitable as most others, *ib*.
- Hampshire, specific characters, and excellent qualities, 121.
- Highland, characters, indifferent qualities, &c. *ib*.
- Northampton, characters and different qualities, *ib*.
- Shropshire, characteristics and quality, *ib*.
- Rudgwick breed, account of this valuable species, *ib*.
- Swing-tail, its size and good qualities, 122.
- Woburn, the large spotted, characteristics and excellent qualities of this breed, *ib*. *See Swine*.
- Observations on buying lean hogs, 132.
- Horns of cattle, method of exterminating, 57. Of sheep, their extirpation, principally confined to the sheep-walks of Spain, the South of France, 112. Manner of performing this operation, *ib*. 113. Of cattle, a mark by which to ascertain their age, 73.
- Horse, how to know the age of, by his teeth, 144, and foll.
- Horses, enquiry into the question respecting their superiority to oxen, 64, and foll.
- their inferiority to oxen for working, 68—70. Necessity of employing them in some parts of the country, 71. Propriety of the farmer to keep a few draught horses, *ib*.
- on the choice of, for agricultural purposes, 135—138. Clydesdale breed of, *ib*. Cleveland bays, *ib*. Suffolk punches, 136. Old English draught horse, 137. Characters of wild and tame horses, 138. Observations on breeding, 138—140. Management of mares while breeding, 139, 140. Feeding, &c. of horses, on return from labour, 141—143. Earl of Darlington's practice, 144. Rules for ascertaining the age of horses, 144—148. Criteria by which to know good and sound horses, 148, 149.

House-lambs, best method of rearing them, 115. The Devonshire breed of ewes best calculated for producing them, 115—117.

I.

Improvement of the form of live stock, strictures on, 19, 20.

Internal form of cattle, observations on, 16—19.

Irish cattle, description of, and observations on, 31, 32.

Isle of Sky breed, characters of, 29.

K.

Kindly-skinned, explanation of the term, 12, note.

Kindliness of the skin, an important sign to discern, the beasts more easily fatten than the other, 14.

Kine, qualities necessary for whatever purpose they may be intended, 15.

L.

Labour, aptitude for, to be regarded in choosing cattle, 15.

Lambing Season, treatment of ewes during, 94—98.

Lambs, proper time of weaning, 99. Castration of, 100.

Lancashire, or long-horned breed, characters, advantages and disadvantages of, 27.

Lasteyrie, M. his reason for the extirpation of the horns of sheep, 112. Account of the manner, 113.

Lewis's (Dr.) preparation for marking sheep, 105.

L'Hommedieu, M. his opinion of the treatment of calves, 46.

Lincolnshire breed of sheep, 76.

Lowland breed of cattle, 30.

Lungs of cattle, remarks on, 17.

M.

Magnis Count de, rotation of crops now taken from lands formerly suffered to lie fallow, 106. His accuracy in his management of sheep, 106—110. His mode of shearing sheep, 101, 102, note.

Marking of sheep, 105, 190.

Marshall, Mr. his proportions essentially necessary for working cattle, 11.

Marshall, Mr. his description of a calf-stage, 55.

Marshall, Mr. his refutation of the objections respecting the working of cattle on farms, 71, 72. On the destruction of ant-hills, 199.

Merino breed of sheep, 86—89.

- Mice, hints for destroying, 200—203.
 Mixture for promoting the discharge of the after-birth, 44.
 Mixture recommended to render the use of new milk in rearing calves unnecessary, 49. For salving sheep, 105.
 Mules, breeding of, 152, 153.

N.

- Norfolk breed of sheep, 84.
 Northumberland, the Duke of, modes suggested by his Grace for rearing calves, 47.

O.

- Oxen, the real value of this animal only generally known for these few years, 58. The most valuable breeds for working, *ib.* Qualities requisite in a good ox for the plough, 58, 59. The most successful method of training them to the plough, 59, 60. Attention to be paid to them on their return from work, 61. Mode of training them and working them in North-Britain, 61, 62. General character of the ox, 62. Portuguese method of working, *ib.* Shoeing of oxen, 63. Comparative view of the advantages and disadvantages of oxen, 64—72. See also *Cattle*.

P.

- Parry, Dr. his patriotic exertions to introduce the wool of the Anglo-Spanish cross, 87, 88.
 Pelvis of cattle, remarks on, 17.
 Pigeons, breeding and rearing of, 164—166.
 Pole, Colonel, his method of working oxen, 65.
 Pole-cats, to destroy, 209.
 Portugal, manner of harnessing oxen in that country, 62.
 Potatoes, their importance as food for sheep, 110.
 Prize ox, delineation of, the property of Mr. Westcar, 25.
 Poultry, different kinds of fowl comprised under that term, method of rearing them, 158, *et seq.*
 Purchasing of live stock, general observations on, *et seq.*

R.

- Ram, qualities requisite to form a good one for breeding, 90, 91.
 Rats, hints for destroying, 200—203.

Requisites necessary for the support of live stock, on a farm, 12.
Romney-marsh breed of sheep, 80.

S.

Salt, necessity of supplying live stock plentifully with this article, 110.

Rock salt preferable, 111. Prejudice against its use in some countries, ib. In what manner best given, ib.

Severing of sheep, 106.

Shearing of sheep, proper methods of effecting, 100—102. Method pursued on the Continent, 103, 104, note.

Sheep, general remarks on, 74. On the the teeth of sheep, 114:

—— Dishley, or new Leicester breed, specific characters, peculiar advantages of this breed, and where found, 75.

—— Lincolnshire, specific characters and advantages of the, 76.

—— Teeswater breed, a variety of the Lincolnshire, specific characters and advantages, &c. 76.

—— Cotswold, specific characters and advantages of the, 77.

—— Dartmoor, or Devonshire Natts, specific characters and advantages, 78.

—— necessity of inspecting them at least twice in the year, particularly in the winter, 106, 107—114. Other considerations on these half-yearly musters.

—— Period of their gestation, 94. Mr. Culley's observations on the teeth of sheep, 114.

—— Herefordshire, specific characters, and uncommon advantages of this breed, 78.

—— South Down, specific characters and peculiar advantages, where generally bred, 79.

—— Cannock-Heath, characters, &c. of, 80.

—— Romney-Marsh, specific characters and advantages, 80. Its excellent and finely-grained flesh, ib.

—— Herdwick, characters and advantages, 81.

—— Cheviot, specific characters and advantages of this hardy mountainous breed, ib.

—— Dun-faced, remarkable for its fine texture of wool, and excellent flesh, 82.

—— Shetland, description and qualities of the, ib.

—— Horned, 83.

—— Exmoor, specific characters and advantages of, ib.

- Sheep, Dorsetshire, their qualities, *ib.*
 ——— Norfolk, characters, fineness of fleece, well flavoured flesh, &c. 84.
 ——— Heath, Linton, Short, or Forest, specific characters, and excellent qualities of this hardy breed, 85.
 ——— Merino, specific characters and qualities, 86. The first introduction from Spain into England, *ib.* Difficulty of removing the prejudice against the wool of the Angola-Spanish cross, &c. 87. Its real value; established first by the patriotic exertions of Lord Somerville and Dr. Parry, 87, 88. Result of the practice of the latter gentleman, 87—89. Mr. Bakewell's observations on the *greasing* of sheep, 192, 193. Swedish method of washing sheep, 194, 195. Improved method of marking them, 196, 197. Advantages to breeders of keeping registers of their flocks, 197.
 ——— Time and proper age for purchasing, 89—91. Time, &c. for shearing, 100. Different modes of shearing, 100—104. Mr. Curran's method of salving, 105.
 Shepherds, how remunerated in Saxony, 114.
 Shetland breed of sheep, 82.
 Shoeing of oxen, advantageous mode of, 63.
 Sinclair, Sir John, his opinion respecting the breeding of cattle, 23.
 The males to be calculated for the shambles, and the females for the dairy, &c.
 Slugs, to destroy, 210.
 Small-boned cattle to be chosen for breeding, 12.
 Snails, to exterminate, 208.
 Somerville's, Lord, his patriotic exertions to establish the value of the wool of the Angola-Spanish cross, 87.
 ——— Lord, his remarks on working oxen to advantage, 64. On weighing cattle, 135.
 ——— Lord, his method of working oxen, 66. Observations on the Devonshire breed, 24, 25.
 South-Down breed of sheep, 79.
 Staffordshire breed of sheep, 80.
 Stock, live, its great importance to farmers of late years, 9. Numerous improvements in the purchase, breeding, &c. *ib.* Necessity of observing a due proportion between the stock and quantity of seed to feed them on a farm, *ib.* Whether large or small-boned cattle are preferable, 10.

- Sucking-pigs, best time for killing them, 125.
 Sussex breed of cattle, characters of, 25.
 Swine, highly profitable to the breeder, 118.
 ——— when capable of propagating their species, time of gestation, &c.
 123—126. Necessity of paying attention to such as are kept for
 breeding, *ib.* Propriety of the breeder to arrange each time for far-
 rowing, 124. Caution to be paid to young sows at their first farrow-
 ing, *ib.* Sows farrowing at the same time, to be confined in separate
 pens, or sties, *ib.* Weaning of young hogs, 125. Necessity for ring-
 ing them, *ib.* Substitute for ringing, 126. See *Hog*. Best time for
 selling, 131.

T.

- Tables of equalization of weights, 133, 134.
 Teeswater breed of sheep, 76.
 Teeth of sheep, observations on, 114.
 Touch, an excellent sign to discern the kindliness of lean beasts to fat-
 ten, 12.
 Trefoil, astonishing quantity of that plant annually raised, 107.
 Turkeys, breeding and rearing of, 162, 163.
 Turnips, how to protect from the depredations of the fly, 208, 209.

V.

- Vermin, on the destruction of, 197—212.

W.

- Wakefield's (Mr.) successful method of rearing poultry, 159.
 Water-fowl, breeding and rearing of, 167.
 Wear and tear of working oxen, comparative view of, 72.
 Weasels, hints for destroying, 203.
 Weather, changes of, how indicated, 213—218.
 Weight of cattle, observations on, 126—130. Weighing cattle alive,
 131, 132.
 Wild cattle, specific characters of, 23. Where now only found, *ib.*
 Wool, observations on the improvement of the quantity and quality of,
 177, *et seq.* Period of its growth, 177, 178. Different sorts of, 178,
 179. Improved by crosses with Spanish sheep, 179, 180. Qualities
 of good wool, 180—182. Table of breeds of sheep, according to the

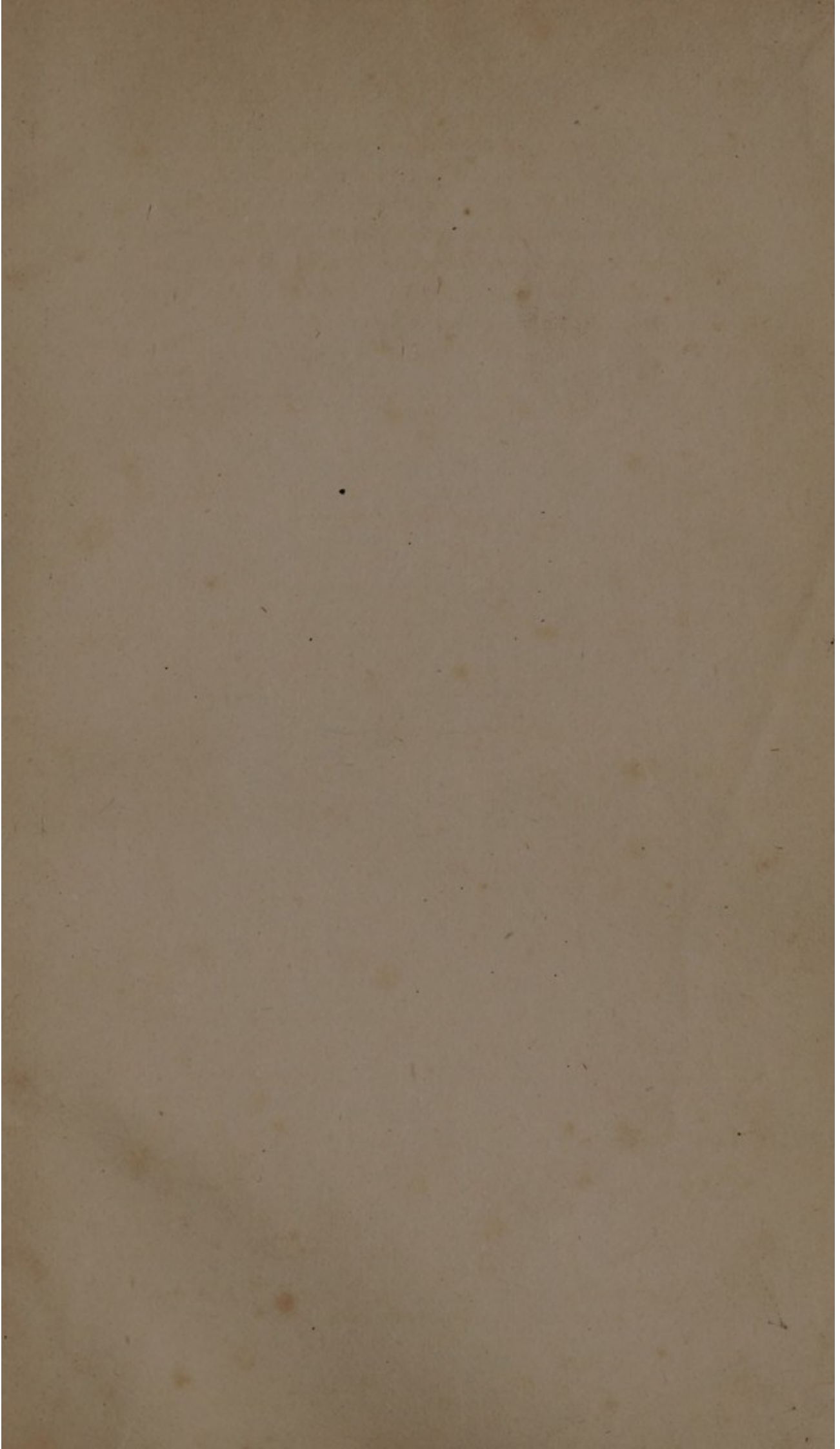
fineness of the fleece, 184. Table of the quality of English wool, according to the fineness of its pile, 185, 186. Total value of British wool, 186. Hints for the improvement of fleeces, 188, 190. Mr. Bakewell's observations on the influence of soils upon wools, 190, 191. On the advantages derivable from the greasing of sheep, 192, 193. Swedish manner of washing sheep, 194.
Working, fatness for, to be regarded in choosing cattle, 15.

Direction to the Binder.

The Plate representing horses' teeth, to face page 145.

ERRATUM.

Page 14, last line but 5, *dele* "The nature," &c. to "subsequent chapter," and the note.



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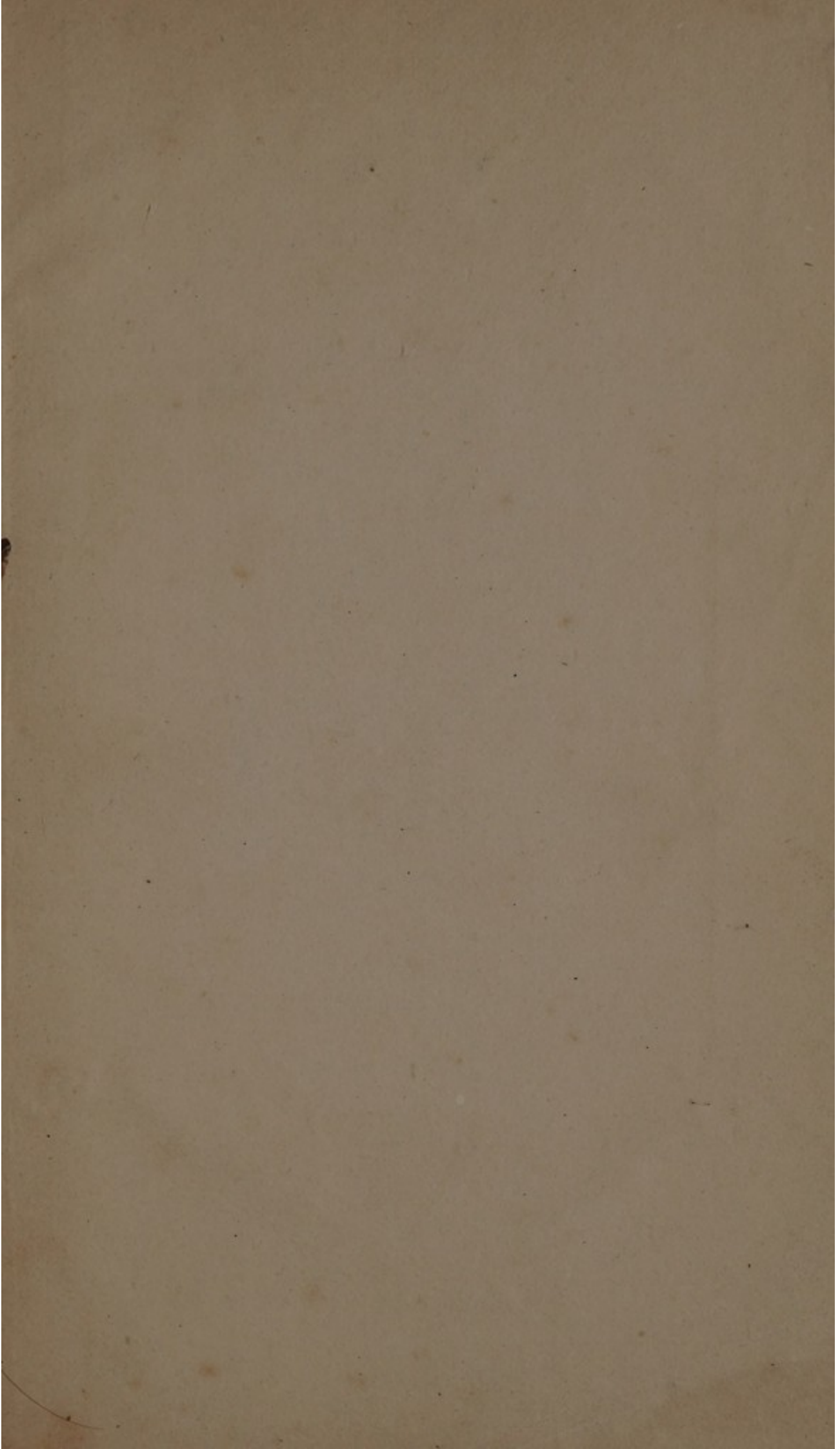
Faint, illegible text centered on the page, possibly a section header or a line of a list.

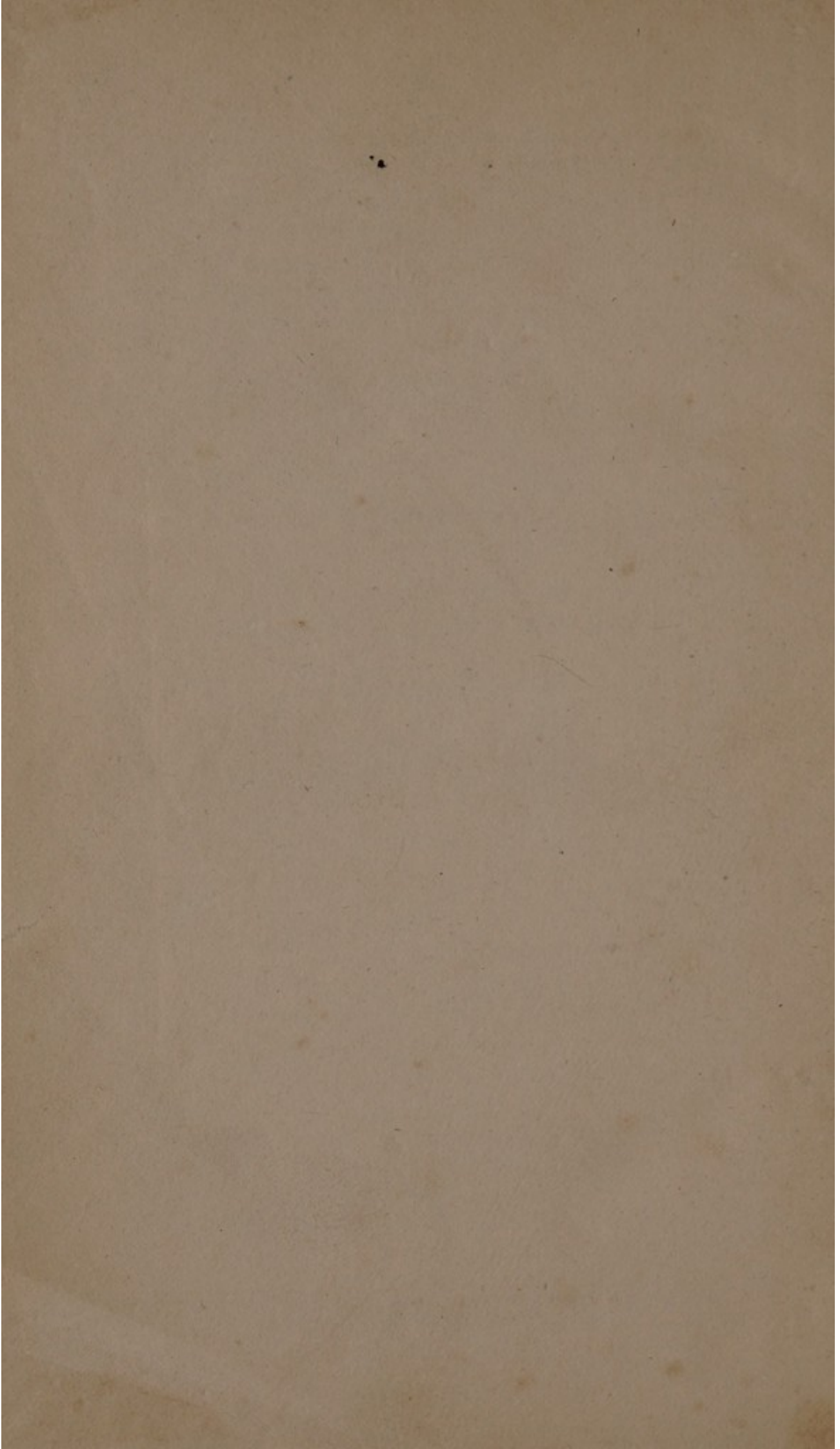
Faint, illegible text in the middle of the page, possibly a paragraph or a list item.

Faint, illegible text centered on the page, possibly a section header or a line of a list.

Faint, illegible text at the bottom of the page, possibly a footer or a concluding paragraph.

Faint, illegible text at the very bottom of the page, possibly a footer or a concluding paragraph.





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