TREATISE

ON THE DISEASES, &c. OF SHEEP.

Published by I Riley,
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For General Locke
present by
Jn° B. Taylor.

A

TREATISE

ON

THE DISEASES AND MANAGEMENT

OF

SHEEP;

WITH INTRODUCTORY REMARKS ON THEIR

ANATOMICAL STRUCTURE;

AND

AN APPENDIX,

CONTAINING DOCUMENTS EXHIBITING THE VALUE OF THE MERINO BREED OF SHEEP, AND THEIR PROGRESS IN SCOTLAND.

BY SIR GEORGE STEUART MACKENZIE, BART.

INDOCTI DISCANT, ET AMENT MEMINISSE PERITI.

NEW-YORK:

Printed and Published by I. Riley.

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1810.

TO DAVID HUMPHREYS, ESQ.

SIR,

FROM an impression derived from the reputation you have so justly acquired as the patron and promoter of Agriculture and Manufactures in our country, I feel convinced that the present edition of this Treatise, *cannot be dedicated to any other person, with greater propriety, than to you.*

That the same patriotic spirit which animated you in the glorious cause of American Independence, should prompt you to apply your liberal views and useful talents in improving the resources of your native country, and encouraging the ingenuity and industry of your fellow-citizens, was, perhaps, naturally to be expected from one, who, as the selected associate of Washington, would always feel ambitious of imitating his noble examples; and it must surely afford much pleasure to every lover of America, to find that such great success has already favoured a project so worthy of your enterprise.

That the present publication may prove serviceable in aiding and promoting your laudable and enlightened plan for covering our pastures with the finest Fleece, and in giving a more extensive currency to that knowledge and skill in the subject, which you are so studious to inculcate, is the sincere wish of

Your obedient servant,
I. RILEY.

TO THE

NORTHERN ASSOCIATION

OF

GENTLEMEN AND FARMERS,

BREEDERS OF SHEEP.

GENTLEMEN,

I CANNOT dedicate this little volume more properly than to men who, to liberal ideas and enlightened views, have joined a noble zeal in pursuing and improving a mode of occupying our mountain pastures, which has prodigiously increased the value of a very extensive tract of country, and made a very large addition to the resources of the empire.

It may be thought by some, perhaps, that enough has been written on the diseases of sheep; and that I presume too much in offering any thing on the subject. Although I feel that I stand in need of much indulgence, yet I hope that you will not pass such a sentence on my humble endeavours to be of use to those who are about to enter on the business of sheep-farming.

I had some thoughts of executing this work several years ago, but relinquished them on my not finding any of my medical friends sufficiently disengaged to assist me in the dissections which I thought necessary. In the mean time, on the suggestion of my learned and worthy friend Dr. Coventry, I took

advantage of my being Convener of the Prize Committee of the Highland Society, and proposed the premium which called forth many valuable essays on the diseases of sheep, which, after having been compressed into one memoir, by Dr. Duncan, junior, have been published in the Transactions of the Society. Having perused that memoir, I was fully convinced that a more intimate knowledge of the anatomy of sheep than seemed to be possessed by the authors of the essays, who were not medical practitioners, was necessary before any regular system could be formed for preventing and curing the diseases to which these useful animals are liable. I, therefore, lately made another attempt to obtain the assistance of a person well qualified for the task; and it gives me great pleasure in informing you that Mr. James Wardrop, whose abilities are too well known to require any eulogium from me, has kindly afforded me the assistance I required. To him you are indebted for the first part of this volume. The rest did not require much labour; and as far as my scanty knowledge of medicine and surgery has enabled me, I have endeavoured to execute the task I assigned to myself, with brevity and distinctness. The anatomical observations are, purposely, very general; but it is hoped, sufficient to give a correct idea of the different parts most essential to life. Had the observations been more minute, they might have appeared tedious, and probably have deterred those for whom this volume is chiefly intended, from entering at all on a study which is of more importance to sheep-farmers than is generally allowed.

Owing to the very extensive ranges which sheep are permitted to have on large farms, it is difficult to discover a sickly animal, before its disorder has made so much progress as to render every attempt to remove it quite unavailing. On that account it becomes of very great importance to feed and manage sheep in such a manner as to expose them

in the least possible degree to any thing which might injure their health. But before we can prevent diseases, we must understand their nature. We have not yet arrived at a sufficient degree of knowledge for enabling us to distinguish the diseases of sheep with accuracy, or to trace them to their origin.—Thousands of these animals have been opened after death; but although we have been told that the liver, the stomach, or other viscera, have been affected, we find the appearance of the parts indiscriminately and arbitrarily referred to the disease under which the animal was presupposed to have been suffering. Unless there has been a careful observation of the symptoms by which an animal has betrayed an inward complaint, an examination of the appearances which present themselves on dissection is almost useless. Before we can accurately discover the nature of any disease, we must observe the early, intermediate, and last symptoms, and then search for the cause, by dissection. It will be necessary, too, to kill some animals labouring under the first symptoms, in order that the situation of their cause may be discovered. When we are told that the general appearance of the body of a sheep which died of *braxy*, was that of an inflamed, or mortified mass, we are not conducted to the original seat of the disease. While one person insists that an affection of the liver is the cause of the rot, and another maintains that that malady originates in the lungs, we are not satisfied. Sometimes both the liver and the lungs are found to have been affected, and then we are still farther from the object of our search.

By knowing the functions of the different organs, and their connection with various parts of the body, we may sometimes discover that some apparently very trifling circumstance may have been the cause of the most formidable diseases. Whilst those who have the best opportunities of observing sheep, are ignorant of the uses and actions of the different parts

of their bodies, we cannot expect to make much progress in acquiring knowledge of the causes of the various diseases to which these animals are subject. In the management of horses, we see the beneficial effects which have followed a display of their anatomical structure; and almost every groom can tell the causes of any particular symptom of disease. I have humbly endeavoured to pave the way for shepherds to acquire a competent knowledge of the structure, and uses of the most important parts of the animal in whose health they are so much interested; and I trust that others who have more opportunities, and are more skilful, will follow up the subject, and collect such facts and observations, as will enable us to manage our flocks without having recourse to the assistance of vulgar prejudice.

My friend Dr. Duncan is right when he prefers good management to doctoring; but to arrive at that, we must be able to understand the causes of what we wish to avoid.

The following pages are by no means meant to supply that want of knowledge I have deprecated. They are meant merely to serve as an introduction to a more extensive work, which I do not consider myself qualified to undertake, but which, I hope, will be executed by a person fully competent for such a task; and to present, in a condensed form, what, in my humble opinion, is the best information we have, respecting the diseases which most commonly affect sheep in this country. I have transcribed an entire memoir by M. Pictet, on the foot rot, being confident that it will be very acceptable to those who have Spanish sheep, which are said to be very liable to that disease; and I have freely taken from other sources, whatever I thought useful; and I hope that you will agree with me, when I repeat, *nec aranearum sane textus ideo melior, quia ex se fila gignunt; nec noster vilior, quia ex alienis libamus ut apes.*

In the Appendix, I have collected some of the most interesting documents which exhibit the value of the Merino sheep. Mr. Culley, in the last edition of his useful treatise on live stock, has given a succinct history of that breed, collected from various sources. Being desirous to detail the progress and valuable qualities of the Merinos, to those who may not have had opportunities of attending to them particularly, and who may be induced to take up this volume, I have selected the accounts which have been given from time to time, of his majesty's flock; and have added such information respecting the Merinos in Scotland, as cannot fail to be highly interesting to those who are active in introducing this valuable breed.

Wishing, heartily, that success may attend your individual exertions, and that the objects of the association may be attained to their full extent,

I remain,

Gentlemen,

Your faithful and obedient servant,

G. S. MACKENZIE.

TREATISE

ON THE DISEASES, &c. OF SHEEP.

PART. I.

TREATISE

ON

THE DISEASES, &c. OF SHEEP.

PART I.

Organs of Digestion.

ALL animals which chew the cud have more than one stomach. Sheep have four stomachs. In these animals, the food, after being masticated in the mouth, is carried by the gullet directly down to the first stomach, which lies upon the left side. This is the largest, and is generally called the paunch. On the inside it has a vast number of blunt-pointed eminences which give it a general roughness, and extend the surface to several times the size of the paunch itself. The food, after remaining here a certain time, and being macerated and mixed with the particular fluids which are poured in upon it, is forced up again into the mouth, and is there further prepared for digestion by chewing. This is what is called chewing the cud, or rumination. After this the food is sent down the gullet into the second stomach, the gullet, having an opening common to it and the first, ends exactly where the two stomachs meet. There is also a smooth gutter, with rising edges, which leads into the second stomach, from thence to the third, and then to the fourth. Thus

the animal has the power of directing the food into whichever stomach it pleases.

The second stomach, which is the lesser, is called the Bonnet, or King's Hood; and consists of a great number of cells, or excavations, on the internal surface, resembling a honeycomb. The food is here further macerated, and is then pushed forwards into the third stomach, or *Many Plies*, so called because the internal surface rises up into a great number of folds, which lie above one another.

From the third stomach the food passes into the fourth, called the *Reid*, or *Red*, which is the common name it has received from its colour. It resembles the human stomach, or that of a dog. It is the fourth stomach of the calf, with the milk curdled in it, that is commonly taken for making rennet. (See plates 1st and 2d, with the explanations.)

There are other animals which feed on the same substances with sheep, that have no such mechanism in their digestive organs. Horses, particularly, have only one stomach, in which the grass is macerated, and the nutritious part extracted; the rest is discharged very little altered. From this difference in the structure of the stomachs of these creatures, a ruminating animal, or one with four stomachs, will be satisfied with one third less of food than another of equal bulk; and graziers are well acquainted with this. The reason is, that ruminating animals have many and strong digestive organs; all their food is fully prepared; and almost wholly converted into a nutritious fluid, which is mixed with the blood. But the stomach of a horse is not fit for this; so that he requires a much greater proportion of food, in order to extract the same quantity of nourishment.

The guts of sheep are of considerable length in proportion to the bulk of the body. It is a general remark that the length and capacity of the guts are different in different animals according to the nature of their food. All animals which live on vegetable

food, have not only their small guts considerably longer, but also their great guts more capacious than such creatures as feed on other animals. The reason of this seems to be, that as animal food is not only much more easily reduced into the nutritious fluid called chyle, but more prone to putrefaction, a long retention of it might be followed by the worst effects; therefore, such creatures as subsist on animal food, require shorter and less capacious intestinal canals than those which live on vegetables; which being less capable of being dissolved and converted into an animal nature, there is a necessity for animals which feed on them being provided with a long and capacious canal, in order that the food may be considerably retarded in its passage, and be more completely changed. The digestion of the sheep, like that of the cow, and some other animals, is accompanied by a particular kind of action or process, called rumination; the intention of which seems to be, that the food may be sufficiently comminuted, and thus be more extensively acted upon by the stomach. It is not observed that a lamb or calf ruminates while it feeds on milk alone; but the operation takes place as they begin to eat solid food. As long as the young animals feed on milk, the food descends immediately, along the gutter already mentioned, into the fourth stomach, without stopping in any of the first three. The rumination does not take place till after the animal has eaten a considerable quantity; after which it lies down, if it can do so conveniently, and then begins to chew the cud; though the operation will also take place in a standing posture. In the action, a ball is observed to rise from the stomach with great velocity; this is chewed very accurately, and is then swallowed; another ball is forced up and chewed; and so on, till the whole of the food which the animal has eaten, has undergone the operation. By means of rumination, the animal extracts a much larger proportion of nourishment

from the food, than those animals which do not ruminate; and hence sheep and cows are contented with much worse fare, and less of it, than the horse.

After the prepared food leaves the stomach, it meets with the bile, which is prepared and secreted by the liver. In a hollow of the liver is placed the gall bladder. These, with the pancreas, or sweetbread, connected with the upper part of the alimentary canal, and the spleen, are organs all subservient to the process of digestion. As the food converted into chyle, passes along the guts, it is absorbed by vessels opening into them for that purpose, and carried by them into the blood. The guts have a constant motion, and a muscular power, by which the food is carried through all their windings; and they are kept from entangling by the membrane called the mesentery, or web. After having been deprived of all its nutritious parts, the food becomes reduced into what is called fæces, or excrement, which is expelled by an exertion, occasioned by a natural feeling excited by the matter having been brought to a state rendering it dangerous to be retained.

Contents of the Chest, or Thorax.

The cavity of the chest, or thorax, as it is called by anatomists, is separated from the abdomen by a strong muscle, called the diaphragm, which is spread across the inside of the body. The chest contains the heart and large blood-vessels, and the lungs. The structure of the heart in quadrupeds much resembles that in man. It is inclosed in a firm bag, or capsule, called the pericardium, from its surrounding the heart. The shape of the heart is conical, and is placed in a line with the breast bone, or sternum. It is hollow within, and is divided into four distinct cavities, which either communicate

with one another, or which have openings leading from them into the blood-vessels. Two of these cavities, called the right and left *auricles*, are situated at the base of the heart, and receive the blood from the veins, and propel it into the ventricles. The other two, called the right and left *ventricles*, receive the blood from the auricles, and then propel it into the arteries. (Plate 2d, fig. 2d.) The *veins* collect the blood from the different parts of the body, and before they arrive at the heart, they are formed into two large trunks, (plate 2d, fig. 2d. a. a.) and there terminate in the right auricle. From the right auricle the blood is thrown into the right ventricle, and the right ventricle propels it through an artery called the pulmonary artery, which conveys it into the lungs. Through the lungs it is circulated, and undergoes those important changes produced by breathing.

Thus changed in its qualities, it is returned by veins, called the pulmonary veins, into the left auricle, (f) and from that into the left ventricle, (g) by which it is forced into the great artery called the aorta, which, by means of branches, distributes the blood over the whole body. This is what is called the circulation of the blood. The rapidity with which it goes on varies much in different animals, and in different states of health of the same animal.

There are, therefore, two sets of blood-vessels to be found in quadrupeds, the same as in man, the *arteries* and *veins*. The veins are formed at the termination of the arteries, and convey the blood, after it has been distributed over the body, back to the heart. The arteries are distinguished from the veins by their pulsation; for the impulse of the motion of the left ventricle of the heart is communicated to the large trunks of the arteries. But the motion of the blood is gradually retarded, as it passes towards the extremities of the arteries; and before it enters the minute ramifications of the veins, the

pulse is altogether destroyed; in the same manner as water thrown on a piece of sponge, in an interrupted, starting stream, flows through it in an equally continued course.

The principal trunks of the arteries are contained in the centre of the body, where they are least exposed to danger, and derive support and defence from the bones along which they pass. The largest go to the different viscera within the great cavities; the next in size to the muscles and skin; and the smallest to the bones. Another singular provision for the safety of the principal arteries is, that they always pass along a joint on the side towards which it bends. Were they on the opposite side, they would be in continual danger of being ruptured by the bending of the joints. In a few places the arteries become so extremely minute as altogether to exclude the *red* blood, carrying only a colourless fluid.

In a dead animal, the arteries are distinguished from the veins by their whiteness, and the thickness of their coats; those of the veins being much thinner and of a blueish colour.

The Lungs.

With the circulation of the blood, the function of respiration is immediately and necessarily connected. This function consists in an animal inhaling the air of the atmosphere, by means of certain organs, and then expelling it. The organs destined for this office are called the lungs, or lights.

It has been mentioned that a vessel, called the pulmonary artery, arises from the right ventricle of the heart, and distributes its blood through the lungs. By the obstruction of the blood in the organs of respiration, the animal is forced to dilate

them for the admission of air, and immediately after to expel it by contracting them. For this purpose the thorax is furnished with muscles, by the motion of which that cavity and the lungs are alternately dilated and contracted.

The blood, by passing thus through the lungs, undergoes changes indisputably necessary to life; all animals dying in places from which the air is excluded. Being thus changed, the blood is carried by the pulmonary veins back to the heart, and, as has been mentioned, is from thence circulated over the whole body by a large vessel called the aorta.

The blood, when it passes through the arteries, is of a florid, red colour; but when it returns by the veins it is of a dark colour. It has this appearance when it is conveyed into the lungs, from whence it issues with its colour revived. Hence it is evident, that it receives something from the air in the lungs. When air expired from the lungs is examined, it is found to have lost that portion which consists of the gas, or air, called oxygen, which, from its absorption by the blood, has been called vital air. No animal can live in air deprived of oxygen or vital air; and from this, the danger in keeping animals crowded in close buildings arises.

The lungs occupy by far the greatest part of the cavity of the chest; and they are divided into different portions called lobes. They are soft, spongy masses, composed chiefly of an infinite number of cells scarcely perceptible to the naked eye, and which all freely communicate with each other, and with the windpipe, or trachea. Into these cells the air passes during inspiration.

The Brain and Nerves.*

The brain is a soft pulpy substance. Besides the covering of skin and bones, it has particular membranes surrounding it called *dura mater*, *tunica arachnoidea*, and *pia mater*. It is proportionably smaller in all quadrupeds than in man. It is divided into two portions; the outermost being very soft, and of a reddish gray colour, and is called the bark, or cortex; the other is called medulla, which is white, and of a firmer consistence.

The brain is supplied with the finest branches of numerous blood-vessels, which penetrate through the membranes.

The delicate structure of the brain can hardly be described without actual inspection. There are a variety of parts to be observed in it, to which anatomists have given names; and to which some also have attempted to ascribe particular functions. These investigations, however, are, we fear, beyond the bounds of human understanding. There are certain cavities in the brain which particularly deserve notice. They are called ventricles, and are four in number. They are very irregularly shaped cavities, situated in the medullary portion of the brain; and their surfaces are kept constantly moistened with a fluid which sometimes collects in too great quantities, and forms one species of the disease called *sturdy*.

The nerves rise out of the brain. They have the appearance of white cords, and, like the blood-vessels, are distributed over every part of the body. They form the medium of communication between the mind and the external world. The nerves are also the organs of motion, and from them comes the power of muscular action. When the nerve is

* See plate 3d, and explanation.

stimulated, the muscle in which it terminates is convulsed; when it is compressed or divided, the muscle to which it went loses all power, or is palsied. The action of some of the muscles depends on the will of the animal, and is called voluntary action; others are actuated by an internal power, and the action is then termed involuntary. On the first depends the motion of particular parts of the body; and the locomotive faculty; on the second depends the circulation of the blood, the function of respiration, digestion, the motions of the intestines, and other actions necessary to life.

The Teeth.

The age of a sheep may be known by examining the teeth on the forepart of the under jaw. They are eight in number, and appear during the first year, and are all small in size, and pointed. (Plate 2d, Fig. 3d.) In the second year, the two middle ones fall out, and their place is supplied by two new teeth, which are easily distinguished by their being of a larger size. (Fig. 4.) In the third year, two other pointed teeth, one from each side, are replaced by two large ones, in such a manner that there are four large teeth in the middle, and two pointed ones on each side. (Fig. 5.) In the fourth year, the large teeth are six in number, and only two pointed ones remain, one at each end of the range. (Fig. 6.)

In the fifth year the remaining pointed teeth fall out, and are replaced, so that the whole set are large. (Fig. 7.) In the sixth year, the whole front teeth begin to be worn by being constantly rubbed one against another. In the seventh and eighth years, and sometimes sooner, some of the front teeth fall out or are broken, as in fig. 8.

PART II.

Of Wounds, &c.

Wounds of the fleshy parts not being in general very difficult to cure, it may be proper, although sheep are never much in the way of such injuries, to put it in the power of the shepherd to save the life of a valuable animal, when any accident happens.*

The treatment of wounds in brutes differs but very little from the manner of healing them in the human body. The operations of nature are the same in both; and from these are derived the principles which direct the management of wounds. The cruelties which are practised by ignorant and unskilful persons, in applying their nostrums, and knives, and pincers, and cords, and burning irons, to poor dumb creatures, call loudly for the intervention of common sense and humanity.

It is not intended to enter into all the minutiæ of possible cases of wounds, and to prescribe a mode of treatment for each. This would require a very large volume, and a series of discussions, which would only tend to perplex and disgust those for whom this work is chiefly intended, without being of any material use. All that is proposed is to direct the shepherd how to act in ordinary cases, in which a reasonable hope of success may be entertained.

* The observations which follow will apply to other animals as well as sheep, and on that account may be the more useful.

When the fleshy part of a muscle is cut in the direction of its fibres, there is hardly any retraction of the divided parts. But when a muscle is cut across, there is a great retraction, and the wound, according to the vulgar expression, gapes. Thus a very deep and severe wound may, externally, appear to be trifling, and one of less consequence may be thought alarming, when no danger is to be apprehended.

An effusion of blood follows the infliction of a wound, in a large, or small quantity, according to the size and number of arteries and veins which may have been injured. When the blood-vessels are not considerable, and are completely divided, they retract amongst the muscular fibres, and the blood soon ceases to flow from them. When the blood has stopped, another fluid oozes out, and this and coagulated blood, are the applications which nature makes for the cure, and which, in trifling wounds, generally prove effectual. But in extensive and severe wounds, another process goes on, if not prevented. A few hours after the infliction of the wound, the parts become red, swelled, and hot; and symptoms of fever are perceived. All the symptoms increase rapidly; and if the inflammation goes beyond the degree necessary for suppuration, mortification ends the pain. But if suppuration comes on, all the bad symptoms abate.

The cure of wounds is effected by adhesion, or by suppuration. When the sides of a wound, recently inflicted, are brought into accurate contact, and kept together, they adhere very soon, and the wound heals with little or no trouble. But when a wound has been neglected, and in cases of laceration and contusion, this method of cure cannot be accomplished, suppuration must then be trusted to, and it must be brought on by every possible means.—During the process of suppuration the causes of inflammation are removed, and a supply of new flesh

is produced wherever a vacancy has been made. This new flesh sometimes grows in such abundance as to render the removal of part of it necessary. It is in this case called fungous, or proud flesh.

Simple Incised Wounds

Are those made by sharp cutting instruments, and are usually attended, when considerable, by an effusion of blood. If the effusion of blood be great, and if from its florid colour and starting, it appears to proceed from an artery, it must be quickly stopped. If there are no means of applying pressure in the course of the wounded artery, between the wound and the heart, the fore finger ought to be introduced into the wound, and when the jet of blood is felt, it may thus be stopped until the wound be made large enough to admit of the artery being tied. An instrument called a *tenaculum*, which is nothing more than a sharp pointed hook, is the most convenient for securing an artery. A double thread being waxed, and an open knot made upon it, it is put over the instrument. The artery is then laid hold of by the point of the tenaculum, and drawn out a little, the knot is slipped over it, and firmly drawn, and the ends of the thread are allowed to hang out of the wound. Every bleeding vessel may be secured in the same manner; and this mode of stopping the effusion of blood is always to be preferred, as a cure is thus much more quickly and safely carried on than when the sponge, or puff-ball, or rags, are stuffed into a wound; or when any astringents are applied. Such things prevent the cure being effected by adhesion.

When the bleeding is so very profuse as to render immediate applications ineffectual, it may be suffered to proceed till the animal dies; or some more speedy

termination may be put to its existence. Bleeding is always most plentiful when the vessels have been only partially cut. If a small vessel thus partially divided be discovered, the flow of blood may often be stopped by the vessel being cut quite through. When the bleeding is inconsiderable, it will soon cease.

Should the situation of a wounded blood-vessel be such as to render the application of a ligature impracticable, the bleeding may, in many cases, be stopt by pressure on the orifice from which the blood issues. The pressure must be confined to a very small space; and the best mode of applying it is to place a linen compress, about a quarter of an inch square, on the orifice, or mouth of the bleeding vessel, and to press it with one finger.

Whenever the blood has been stopped, or when it ceases of itself to flow, the first thing to be done is to examine the wound, and to remove all extraneous substances that may have lodged in it. If these cannot be got out easily, suppuration must be trusted to for bringing them away. The sides of the wound must be brought together as close as possible. If this cannot be done by bandages and sticking plasters, recourse must be had to the needle. The one used on this occasion must be crooked, and flat. A double waxed thread being put through the eye, the point of the needle is to be introduced at some distance from one edge of the wound, and pushed as near to the bottom as possible, and then brought out at the other side. The needle being now taken from the thread, the sides of the wound are to be pressed together, and the thread tied so as to retain them. The number of stitches is to be regulated according to the size, and shape of the wound. One is commonly used for every inch in length, but more must be made if the edges of the wound do not appear to be in perfect contact. If adhesive plaster can be put on, straps of it should be employed to support the stitches, and prevent them from tearing the flesh. A

piece of linen spread with emollient ointment is to be laid over the whole; and if a bandage can be conveniently, and securely, applied, it will be of very great use. By this treatment, a simple wound may be healed by the first intention. If there be any ligatures, they may be gently pulled after three or four days, when, most commonly, they will come easily away. At the same time, if the wound has adhered, some of the *sutures* may be removed, and perhaps all of them. The first dressing should not be changed for three or four days; and the straps of plaster should be renewed every day, or every second day, till the parts are firmly united.

In managing a wound, shepherds should be careful in examining it; and if by inflammation and swelling, the dressings and bandages become very tight, (a circumstance which frequently happens,) they should be immediately removed, and a poultice applied; or the parts may be fomented. Dangerous symptoms often occur from very trifling wounds. But if following the directions already given be not attended with success, it is but a chance that any other treatment will be effectual.*

* If a more intimate acquaintance with the nature and cure of wounds be desired, gratification may be obtained by consulting any of the elementary works on surgery.

The prejudices of some people will not allow them to believe that there is even the most distant analogy between the structure of inferior animals and that of the human frame. There are some who despise information, merely because a method of cure, adopted for similar diseases in the human body, is proposed for the disorders of brutes. Some symptoms of this may be seen in page 189 of Mr. Hogg's Shepherd's Guide, where he disbelieves the assertions of Mr. Stevenson, a very respectable surgeon, because he describes what Mr. Hogg never saw; and proposes a method of cure not consistent with the Ettrick Shepherd's notions of medicine. I am aware that the reference to books on surgery for further information on the nature and cure of wounds, will appear absurd in the eyes of some people who disregard all knowledge, but what they can gain by their own experience; a method of acquiring it the most dilatory and expensive which can be followed.

Punctured Wounds.

In these the orifice is very small in proportion to the depth of the wound. Of this kind are wounds made by any pointed instrument, splinters of wood, thorns, the teeth of animals, &c. They are much more dangerous than simple incised wounds; and this is owing to their always exciting a much greater degree of inflammation, and to the difficulty of getting the sides to adhere uniformly. When the orifice heals before the parts below, very troublesome collections of matter are formed. In such cases poultices are useful. Fomentations, with a decoction of chamomile flowers, will also be of much service, and are perhaps preferable to poultices. The method of applying them is, to dip a piece of flannel into the decoction when very hot, then to wring it, and apply it to the parts; dipping the flannel again, when the heat has gone off.

Lacerated and Contused Wounds.

Under this head may also be included the bites of dogs, &c. In such wounds the parts are torn asunder or bruised so as to have their continuity destroyed.

Although in these cases, there is less appearance of danger than in any already described, yet, in reality there is much more to be dreaded. From lacerated and contused wounds, there is not usually any considerable flow of blood, and sometimes there is no effusion whatever; a circumstance by which the danger of wounds is too often ignorantly estimated. The parts on which the injury has been inflicted, having had their texture completely destroyed, sometimes mortify and fall off; or are reduced into matter and sloughs, and thus a cure is obtained by sup-

puration. But inflammation often comes on so severely as to cause a rapid mortification of the surrounding parts. When mortification begins in the human body, its progress may, in many instances, be arrested. But in the case of an inferior animal, it is, perhaps, impracticable to employ the same means for stopping it. Here, therefore, it is only necessary to point out the means of bringing the wounded parts to such a degree of inflammation as will cause suppuration.

When the wound has been cleaned, and freed from all extraneous substances, such parts as are almost completely torn, or squeezed off, should be removed. A large warm oiled poultice is then to be folded in a bag made of thin linen, or muslin, and laid gently on the wound and neighbouring parts, and should be changed twice a day. Unless the injury be exceedingly severe, this treatment will, most probably, bring on suppuration, and the mortified parts will separate. When this has happened, and when this inflammation has abated, the wound may be dressed once a day with a plaster of hog's lard. The wounded animal should be allowed to move about as little as possible, and food should be sparingly given to it.

Wounds of the Joints

Are very difficult to manage. The cure may be attempted by keeping the air from the wound, and bringing the sides into contact by means of sticking plaster. If a great degree of inflammation appear, poultices should be employed. An extensive wound in a joint may be considered as incurable.

Poisoned Wounds.

Not unfrequently sheep are bitten by snakes. As the wound inflicted by these reptiles is very small, the injury is never perceived till the poison has entered into the system. Sheep are often observed to become sickly and to swell. These symptoms are often attributed to braxy and rot, when, in reality, an adder or viper has occasioned the mischief. When it is suspected that a sheep has been bitten by a snake, doses of oil should be given, or, if at hand, small, but frequent doses of volatile salts mixed with water.

One of the French journals of 1802, contains the following article: "Snakes have increased this year so much in number on the large commons, that the proprietors have sustained great loss by them. These reptiles, particularly in the spring, suck the milk of the sheep, and when the wound they inflict is deep, the two teats dry up, so that the sheep which continue to be fruitful, can no longer suckle their young; but when the wound is slight, the wounded teat only dries up. In several of the commons in the department of Landes, there are flocks the sheep of which have been sucked in the proportion of four to one."

Sprains.

The usual treatment of sprains is to keep the part constantly moist with the goulard water.

Sprains in the feet of horses, have been relieved by placing the limb in a pail of hot water now and then. It is very probable that this treatment may be successfully practised when a similar accident happens to sheep.*

* I have tried this on the human foot with success.

Fractures.

The mending of a broken bone, though somewhat tedious, is by no means difficult, when the skin covering the fracture has not been torn. Let the limb be stretched, and the broken ends of the bone placed very accurately in contact with each other. A piece of stiff leather, of pasteboard, or of thin wood, wrapt in a soft rag, is then to be laid along the limb, so that it may extend an inch or two beyond the contiguous joint. Whichever of these substances be employed, it should be carefully secured in its situation by a bandage of linen, or flannel, an inch and a half broad, and two yards long, or more if necessary. After having been firmly rolled up, it should be passed spirally round the leg, beginning at the foot, and carrying it up to above the end of the splint.* The splint should be worn during ten days or a fortnight, and the bandage should be continued till the leg has acquired its former strength. When any considerable swelling appears, the bandage should be carefully slackened, and tightened again when the swelling abates. When a bone is broken in more than one place, all the pieces should be placed in their natural situation, and secured and healed in the same manner.

It sometimes happens that a fracture is rude, and that part of the bone is protruded through the skin. In such a case a wound must be made of sufficient length to allow the bone to be replaced, or a portion of the fractured extremities cut away with a saw. The bandage and splint are then to be applied as already directed, and the wound must be dressed, as often as shall appear necessary from the quantity of the discharge, with hog's lard, or simple cerate.

* The term splint is applied to pieces of wood joined together with leather, or any thing applied to keep broken bones in their places.

When a bone has been crushed, amputation is the only resource, which can, with confidence, be pronounced safe; but this is an operation which probably will not be attempted. There is, however, a very fair chance of success in laying the limb open, and removing the whole of the injured part of the bone. Although the ends of a divided bone be at a considerable distance, new bone will fill up the space, provided the limb be kept perfectly steady.

Operation of Bleeding.

This operation is most conveniently performed on a large vein, whose branches are spread over the face of the sheep. The vein may be felt distinctly coming from the neck, and passing over the edge of the lower jaw to the cheek,* about two inches from the corner or angle of the jaw, or opposite to the third of the grinding teeth. When the operation is to be performed, the sheep is to be held between the limbs of the operator, and the croup placed against a wall to prevent the animal from recoiling; the left hand is to be placed under the head, and the under jaw grasped in such a manner, that the fingers come upon the right side of the jaw, so as to press upon the vein, a little below where it is intended to be opened. By thus pressing on the vein, the flow of blood is prevented beyond the place where the pressure is applied; and the blood, consequently, can find no other course but through the artificial opening about to be made. The operator with the lancet or knife,† opens the vein by making an inci-

* Although the vein be described as coming from the neck, for the sake of distinctness, the course of the blood is from the branches to the trunk.

† The lancet is the best instrument. In the plate, a case is represented having a knife, or scalpel, at one end, and a

sion *obliquely* across it at the place where the trunk is largest, and where it is most distinctly felt through the skin. The oblique direction of the cut, is found to answer better than either one made directly along the course of the vein, or one across it. While introducing the instrument, it is of great consequence to keep the vein from rolling under the skin, and escaping from the point; this is best accomplished by making the incision close to the point of the finger which presses upon the vein. In diseases of the head requiring bleeding, and in particular inflammations of the eyes, it is most advisable to open the vein of the cheek; but in diseases of other parts, blood may also be procured from a large vein that runs along the fore leg. This vein passes from the foot along the back part of the leg to the ham, and then goes obliquely over to the fore part of the limb. It is nearest the surface and sufficiently large a little above the knee, and may, at this place, be easily opened. The operation may be best performed by securing the other three feet of the animal; and the operator, by grasping the limb above the place where the vein is to be opened, causes it to swell, and after it is distinctly felt, makes an incision in the manner recommended when the vein of the cheek is to be opened. (See plate 3d and explanation.)

Operation of Castration.

When the delicacy of the organs of generation is considered, it is a matter of astonishment that lambs so seldom suffer, from being cut in the rude manner in which the operation is usually performed. Great losses are, however, sometimes experienced. It often happens that some hundreds of lambs die on one

lancet at the other. Such instruments are made by Mr. Moyes, cutler, College-street, Edinburgh.

farm, while none die on another in the neighbourhood. This may frequently be accounted for, by some slight difference in the manner of performing the operation adopted by different shepherds, or by some accidental oversight in the management of the animals who have undergone it. By using a very few precautions, and by paying a little attention in performing the operation, all danger may be avoided.

The younger the lambs are when castrated, there is the less risk of losing any of them. Perhaps the best rule is to cut them as soon as the testicles are large enough to be easily got hold of. Some shepherds wait till the youngest of the lambs are old enough, and then there are many so old that the operation upon these becomes dangerous. It is best to take up the lambs as they become fit, however few they may be, which are ready at one time; and in this way much hurry and confusion may be avoided. To this plan it may be objected, that it will give a great deal of trouble in collecting the ewes often, and may injure such as are heavy. As to trouble, such an objection is not worth answering. But as there may be some danger in driving heavy ewes too often, that objection can only be partially removed. The ewes ought to be gathered in small parcels, and taken to the nearest fold, where the heavy ones may be separated, and the rest taken to the place where the lambs are to be cut. Two collections will be sufficient; and if attention be paid to remove the tups in time, to prevent any late lambs being dropped, the shepherd will know exactly when he may gather the ewes for the last time. When the lambs have been cut, they should be put by themselves for a little while, and not allowed to run about in search of their dams. After a lamb has been caught, it should be held a little till its agitation is over. It is then to be lifted and held at a convenient height for the operator.

Different modes of operating have been recommended. Mr. Hogg mentions slitting the scrotum; and it is stated in the memoir drawn up by Dr. Duncan, from the communications to the Highland Society, that the top of the scrotum (by which is to be understood its inferior part) should never be cut away; and from this it may be presumed, that this practice, which has in some cases been found to succeed well, was condemned by all those who sent papers to the society.

In one mode of slitting, the scrotum is divided about half way through, about an inch above its lowest point. It is possible that the blood will unite the divided parts before inflammation comes on, and thus a bag is formed for matter to lodge in; and there being no way for it to get out, it will certainly do mischief. In another mode, a knife is thrust in, and the skin slit up. But in every case there is a risk of the lips of the wound closing and confining matter which may be formed. It is very probable that collections of matter in the scrotum are the cause of the numerous deaths which happen on many farms, while they are attributed to electricity in the air, and many other things, which servants are prompt in bringing forward as excuses, and which masters are too ready to believe. The method so pointedly condemned in the Transactions of the Highland Society does not appear to be the worst. By taking off a part of the scrotum, the testicles are easily started, and should matter form during the cure, it can easily get out. It has been practised frequently on the lambs of my flock, in the following manner. A part of the scrotum being cut off, merely sufficient to allow the stones to pass, the operator starts them by means of his fore fingers and thumbs, pressing on the abdomen with his other fingers. Having removed the stones, in the usual manner, with his teeth, he spits into the scrotum, and presses the sides of it together, drawing it gently

forward at the same time. He then pulls the tail, and cuts about half of it off. Spitting into the scrotum may be ridiculed, but the application is harmless, and may assist in retaining the sides together till the lips of the wound adhere. The bleeding of the tail undoubtedly contributes to prevent too violent an inflammation, and for that reason the docking is deferred till castration is performed, unless pinding renders the previous removal of part of the tail necessary. Since this simple method has been employed, there has not happened one instance of a lamb dying in consequence of the operation. After all the lambs have been cut, and allowed to stand by themselves for a little while, the ewes are let out, and as soon as every one has found her lamb, they are allowed to walk away to their pasture but are not driven.

But a neater mode of performing castration is that which follows. The animal being well secured, the scrotum, or bag containing the testicles, is to be grasped by the left hand in such a manner as to press them forward, and render the skin lying over them quite tense. Two incisions are then to be made through the skin, at the bottom, or inferior part of the scrotum, sufficiently large to allow each stone to pass when pressed out. The testicles are then to be pushed out, one after another, and extracted in the usual way; or, which is a more surgical, and a less painful method, the cords may be cut through about half an inch above the body of the testicles. By cutting, profuse bleeding might be expected; and, in such an event, the vessels would have to be secured as already directed; and it would become necessary to examine the lambs from time to time, and catching them might be attended by bad effects on the wounds. But from recent experiments made on full grown lambs, and rams of four and five years

old,* no bleeding of any consequence takes place. On the whole, this seems to be the safest and least cruel method of operating.

Operation for Sturdy, or Water in the Head.

The disease called sturdy, might have been arranged with the others about to be treated of. But as the cure depends on a peculiar operation, I have thought it best to consider it in this part of the treatise.

The cause of one species of sturdy has been already mentioned. The collection of water in the ventricle of the brain is deemed an incurable disease, and probably is so. The other, and most common species of the disease, arises from animalculæ, called hydatids. In this case the water is contained in cysts, or bags, unconnected with the brain, on which, however, if not prevented, it acts fatally by pressure. It would appear too, that a long continuation of the pressure occasions part of the brain to be completely disorganized, and converted into a substance, the examination of which may afford some instructive hints to anatomists, but which is foreign to our present purpose.

Very soon after water has begun to collect, either in the ventricles or cysts, the animal subjected to the disease shows evident and decisive symptoms. It frequently starts, looks giddy and confused, and as if at a loss what to do. It retires from the rest of the flock, and sometimes exhibits a very affecting spectacle of misery.

* I had six old rams cut in the month of November last, and they all recovered.

Various methods of relieving the pressure on the brain have been proposed, and when put in practice by skilful and patient hands, most of them have succeeded. It would be superfluous to enumerate and describe them all, as a method has been found of perforating the cyst, which has succeeded perfectly in numberless instances; and which, from the ease with which it may be performed, very strongly recommends itself. Yet the operation is one which, from reasoning on the peculiar delicacy of the brain, never would have been advised. We are indebted for it, it would appear, to Mr. James Hogg, who tried the experiment to rid himself of trouble, while a herd-boy. He laid hold of every sturdied sheep which came in his way, and (being employed in knitting stockings) he thrust one of his wires up the animal's nose, and forced it through the skull into the brain. In those cases in which wiring proves fatal, it is probable that the instrument does not reach the cyst. There may, indeed, be some portions of the brain more delicate than others, and, on the whole, however general the success of this operation may be, it must be considered as hazardous. Desperate diseases, however, require desperate remedies.

The more delicate and nice operations of trepan, and extraction of the cyst, are fit to be in the hands of skilful surgeons. But with ordinary servants, the bungling of either, which would be fatal, would occur so frequently, that only the simple operation of wiring shall be described by the explanation of plate 4th, (which see.)

An anatomist may make many interesting discoveries, while attending to the disease and the effects of the operation. That in almost every case part of the brain is displaced and destroyed, has been ascertained. If it shall be found that in animals which recover, the brain is reproduced, so as to fill up the space which had been occupied by the cyst, the fact will be curious and important.

PART III.

DISEASES.

Red Water.

This, and the following article, are copied from Mr. Stevenson's account of them.* "Red water commonly makes its appearance about the beginning, or end of winter, and first affects about the breast and belly. It consists in an inflammation of the skin, that raises it into blisters, which contain a thin, reddish, and watery fluid. These continue for a short time, break, discharge this matter, and are followed by a blackish scab. When the sheep are exposed to cold, or wetness, the skin being fretted makes the blisters rise; or they often arise from cold affecting the animal internally, thus producing a slight fever, which throws out these vesicles on the body, similar to the scabby eruptions which appear about the face, and more particularly the mouth of those persons affected with cold. The blood in this disease is but little affected, although a little of it oozes into the vesicles on the skin, and communicates to them that reddish tinge which gives origin to the name. Red water is a disease that but seldom appears in this country, and it is almost never fatal. In cases where the disease is violent, a little blood

* Transactions of the Highland Society.

should be taken. The sheep should be placed in a fold by itself, the blisters slit up, and a little infusion of tobacco put into them; and the following medicine may be given for three or four mornings successively.

Take of flower of sulphur, ... 2 oz.
honey, treacle, or sirop, . . 3 oz.

mix them, and divide them into six doses, of which one may be given every morning in half a pint, English, of warm water. If this is found unsuccessful, half an ounce of nitre, mixed with the foregoing receipt, will be attended with good effects, after which a dose of salts may be given, and the body washed with lime water."

Erysipelas, or Wild Fire.

"This, like the last-mentioned disease, also affects the skin, and is apt, if not attended to, to spread very quickly among the flock. It is attended with more inflammation than the last; and but seldom with blisters over the body. It commonly appears in August and September, and does not continue above eight days at a time, although those sheep once affected with it are liable to relapse. In former times, it was a practice with shepherds to bury those sheep affected with this disease, at the door of the fold with their feet upwards, which they believed acted as a charm to drive it from the flock. It is necessary, for the cure of this disease, to follow the same method recommended in the red water. An ounce of salts, dissolved in warm water, given every morning, for three or four days, answers remarkably well to begin the cure, when the last-mentioned receipt, with the addition of the nitre, may be continued, till the disease disappears."

The only thing in these prescriptions which seems liable to objection, is giving salts in warm water. The effects of the medicine will be more powerful, and more beneficial, when the solution is administered cold. For washing the body, goulard water is the best application.

Scab, or Itch.

This infectious, troublesome, and destructive disease is well known. It seldom appears among sheep which have been smeared, and when it does, it proceeds, most probably, from the touch of a diseased animal, of a stone, or a tree, or paling, on which scabbed sheep have rubbed themselves. A sheep is never, even slightly, affected, but it proceeds to scratch itself, and to rub its sides and buttocks against every thing it meets. As soon as the disease is discovered, the whole flock among which the scabbed animal has been pasturing, should be carefully examined, and every one which has an appearance of being fretted on the skin, must be taken away to be cured. Several ointments have been proposed for the cure of this disease, and that of Sir Joseph Banks seems to have been most approved of. His prescription, however, can only be made by an apothecary, a personage not always at hand, and who may not always have sheep ointment ready when wanted. Every apothecary has abundance of mercurial ointment at all times, and if a shepherd purchases a quantity of it to keep by him, with a little oil of turpentine, he may always have it in his power to make up ointment when he requires it, and of such a degree of strength as he may judge proper.

The following directions may be found useful:

Take of strong mercurial ointment, 4 libs.
oil of turpentine, ... 1-2 pint, Eng.
hog's lard, tallow, or butter, 4 libs.

melt the hog's lard, or butter. Allow them to settle, and pour off the clear liquid; then add the mercurial ointment, stirring the whole well, till it be melted and incorporated, and then add the oil of turpentine. Keep stirring the mixture for a minute or two, that the mercury may be completely mixed, and then pour the whole into some shallow vessels, that the ointment may cool quickly. If the mercury should appear to have sunk when the ointment is cold, it may be rubbed a little with a smooth flat stick, on a plate. But there will seldom be any occasion for this, if the process be well managed. A very effectual, and a much cheaper ointment may be made as follows:—

Take of corrosive sublimate, . . 8 oz.
train oil, ... 6 gallons, Eng.
rosin, (black or yellow) 2 libs.
tallow, ... 2 libs.

let the corrosive sublimate be reduced to a fine powder, and mixed with a portion of the oil. The rosin, tallow, and remainder of the oil, are to be melted together over the fire, and the sublimate afterwards added.

If this mixture should be thought too thin, the proportion of oil may be diminished, and that of the tallow increased. Were one or two pounds of powdered white hellebore to be added, it would improve both the consistence and efficacy of the ointment. One pound of sublimate, at 10s. will, in this way, go as far as 50 pounds of mercurial ointment, at 3s.*

If the wool be not taken off, either of these ointments, or that of Sir Joseph Banks, is to be laid on, in the same manner as smearing stuff, beginning with a line along the back; one is to be laid on each side and one down each leg. The neck, inside of the

* Mr. Manderston, apothecary, Rose-street, Edinburgh, makes up a strong ointment with corrosive sublimate, which is very convenient, as it may be diluted to the required strength with oil and tallow.

thighs, and belly, should have a share. In every case, however, the wool should be shorn, except during very cold weather, and the animal washed and brushed with soap and water, before the application of the ointment, which may now be applied all over the body. The mercury will have more effect, and less of the ointment will serve, when all filth, and loose scabs have been removed by the washing. What is recommended in another part of this work, viz. anointing the sheep after being shorn, will be found a very effectual means of warding off the scab, and every disease of the skin.

The Leg Evil, or Black Leg,

Is a very formidable disease. It begins at the hoof, or knee, which swells, and makes the sheep quite lame. The limb is usually covered with small blisters, filled with a bluish fluid, and the skin is of the same colour, and soon breaks out in sores. This disease being infectious, care must be taken to remove every animal affected by it from the flock. The wool being removed, the diseased limb should be well washed and cleansed with soapy water. The sores should be dressed with some caustic ointment. Perhaps basilicon, mixed with red precipitate will be found very useful. A little burnt alum, in powder, may be put upon the sores, and the whole limb should be wrapped in a cloth spread with the scab ointment, thinly laid on.

Maggots.

When, on the examination of a sheep, or lamb, which appears harassed and restless, the tumours

under which the maggots are concealed are observed, they should be freely opened, that the vermin may be picked out. The sore may be anointed and covered with a rag spread with smearing stuff. This dressing being daily changed, a recovery is made in a few days. Means of preventing the attacks of flies, which deposit the eggs from which the maggots issue, will be pointed out when the management of sheep is considered.

Sore Nipples.

Lambs very often die of hunger, from their dams refusing them suck. The cause of this is sore nipples, or some tumour in the udder, in which violent pain is excited by the striking of the lamb. Washing with sugar of lead and water, or spirits, will remove the complaint.

Foot-rot.

There cannot be a more complete and distinct account of the foot-rot, than that contained in a memoir by M. Pictet, which has been translated, and printed in the Philosophical Magazine, from which it is now transcribed.—"I think I shall render a service to the proprietors of sheep, by calling their attention to a malady, which, to my knowledge, has not been described by the veterinarists of any country; and which, to the present moment, appears to have been unknown in France. The following is the occasion upon which I observed it.

"In the month of May, 1804, I received from Piedmont a flock of 200 sheep, of various mongrel

breeds, of the second and third generations. The animals came to hand in good condition, but some of them were lame. The flock was placed, with a hundred other mongrels, on a low mountain, the pasturage of which is healthy, and of good quality. We did not pay very great attention to the lame sheep, because, in general, upon a journey, they cripple often from fatigue alone, and their lameness goes off after resting a while. I never yet received a lot of Spanish sheep, among which there were not a few lame ones at their arrival; but this defect was never of long continuance. In the present case, however, the lame animals became worse and worse, and every day others of them began to grow lame, while none of the others grew any better. Not suspecting any contagion, we attributed this affection to the rocky nature of the pasturage, to the frequent journeys which the sheep took from a rivulet to go and feed; and, also, to the circumstance that the sheep-fold was not frequently enough renewed. We took precautions against all these various causes; and yet the malady continued among the sheep. At the end of six weeks every one among them was lame, and some of them were affected in all their four legs. They crawled upon their knees while feeding, and the worst of them fell off very much in their appearance. It now became indispensably necessary to assist this flock by every means in our power. We removed them to the distance of six leagues. Their removal was not effected without great trouble, and was very tedious; we also had recourse to carriages for conveying the most diseased among them. But in spite of all our care many fell victims to the disease, unable to bear the fatigue. The different individuals of the flock presented all the varieties of the disease, which may be reduced to three principal ones. The animals, in the first stage of the disease, were only a little lame, appeared without fever, and preserved their appetite. Upon inspecting

the foot, there was only a slight redness discovered at the root of the hoofs, or a slight oozing out of matter round the hoof; sometimes only a slight degree of heat in the lame foot, without any apparent irritation.

" The sheep which had the malady in the second degree, were lame all fours, had a fever, appeared dull, fed slowly, and were often on their knees, if the fore legs were attacked. Upon inspecting the foot, there was an ulceration, as well at the root of the division of the hoofs, as at the junction of the horn to the leg, accompanied by a fœtid whitish sanies.

" Such animals as were in the third degree of the disease had a continual fever; they were meagre and sorrowful, rose up with difficulty, and lost their wool. The ulceration of the feet was venomous, and resembled a white gangrene. Purulent collections were formed under the hoof, and made their appearance at the junction of the horn and the skin. Among some sheep the hoof was detached, or entirely destroyed; and the flesh of the two divisions of the foot was one complete ulcer. In others the hoof had kept on, because the flowing of the purulent matter made its appearance at the sole, and had gnawed and completely destroyed it. In this case the interior of the foot, after turning it up to look at it, offered only a putrid mass filled with worms, contained in the horn of the hoof; the flesh and ligaments appeared completely destroyed, and the bones of the feet were carious; the smell was cadaverous and insupportable.

" We endeavoured, at first, to classify and separate the animals, according to the stage of the disease. The antiseptic lotions, such as red wine, vinegar, extract of bark, and oak bark, were employed; as also the fumigations of nitric acid, to weaken the putrid tendency, and second the effects of the remedies. I heard, from Piedmont, that the vitriol

of copper, in powder, as a drying caustic, was very useful at the commencement of the disorder, in checking its progress. We employed it, without any remarkable success, upon such animals as were only slightly attacked. It is probable that the contagious influence, which we had not yet learnt to guard against sufficiently, had destroyed the effect of this remedy. The acetate of lead, or saturnine extract, was employed with more advantage. Antimonial beer was useful in drying the wound, and the *lapis infernalis* in burning the bad flesh, which was speedily reproduced after the incisions, which accompanied the complete clearing of the feet.

"The treatment of a flock, in this miserable situation, is extremely perplexing. Four shepherds, and several assistants, were employed in taking care of the 300 lame sheep; and it was an extremely disagreeable business for all of them. The animals were examined every day, one by one; and such of them as were unable to go to pasture were fed in the sheep cot, where the forage was carefully spread out for them, because the sick animals had neither strength nor inclination to pull it out of the racks. It was necessary to renew the litter often, and to perfume the sheep cot several times a day, a precaution which prevented the smell from becoming insupportable to those who dressed the sores. This was not all; the lambs had made their appearance before we had overcome the disease; several of the poor sheep miscarried, or produced lambs which were so weakly that they could not live; others of the lambs died for want of milk, and those which survived took the disease, all which increased our difficulties. The disease raged with all its violence for three months; and during a whole year many of the animals continued lame. If we calculate the loss of the animals which died of the disease, the loss of the lambs, and the great expenses attending so tedious a cure, we may be convinced that the scab itself, terrible as it

is, is a less troublesome malady than the foot rot, when it is contagious and general in a flock. Before pointing out the method of preventing and curing this evil, I shall mention a fact, which will show how far it is contagious, and of how much consequence it is to increase our precautions, in order to get rid of it. The rams, who were upon the mountains at the same time with the diseased flock, took the foot rot. They were separated from the rest of the diseased animals; and, at the end of four months, after having passed through all the usual operations, they appeared to be cured. They still had tender feet, however, and walked with pain; but as the hoof was well recovered, and there was no appearance of ulceration upon it, they were driven to the neighbourhood of a Spanish flock. They were placed under a penthouse, separated from the sheep cot by a wall. Some of these rams continued to eat out of the racks, on their knees, which we attributed to the sole of the foot not being yet consolidated; but, at the end of fifteen days, we perceived that an oozing out of purulent matter had again commenced at the junction of the horn of the hoof. They were then transported to an infirmary, to be submitted once more to the same treatment. The straw upon which they had lain was not taken away; and the Spanish flock having afterwards been sent into the penthouse, the foot rot began to show itself among them in about fifteen days. The rigorous measures and precautions followed, and the treatment I am about to recommend, hindered the disease from proceeding any farther in this flock than the second degree, otherwise I do not believe that a single beast would have escaped.

Precautions and Treatment.

"At all times, upon receiving a strange flock, it is advisable to keep them separated, until it is well as-

certained that they are not infected with the scab, or any other contagious disorder. The precaution is not less proper in the case of the foot rot; for although there may be no crippled animal in a flock newly come to hand, yet there may be one among them which had been imperfectly cured during the journey, and in which the disease may break out anew. If there are any actually lame at their arrival, they must be carefully examined. Sometimes it happens that they may chance to be crippled from some other cause than the foot rot. On a journey the clay sometimes gets hard between the hoofs, and thereby lames the animals. A single glance will suffice to see whether this be the cause of the lameness. Sometimes they are lamed in consequence of the gland between the hoofs being swelled. This is cured of itself, or, at worst, by cutting off the gland; and it is not contagious. At other times the animal is crippled merely from fatigue; for which a little rest is the obvious cure. But if the district from which the sheep came is suspected, all diseases of the feet must be examined more cautiously than usual. A heat in the foot is a certain sign of an abscess existing in the hoof, to which an outlet should be given. The animal must then be separated from the rest, and the operation performed which I am about to describe.

"If the ulceration is visible, the place must be cleaned with a rag, and goulard water laid upon the sore, by means of a feather; or the powder of blue vitriol. In order to prevent any dirt, &c. from getting into the wound, the diseased foot should be placed into a little boot, the sole of which is of leather or felt, and the upper part of cloth, in order to fasten it round the leg of the sheep. This precaution is not only favourable to the animal, it also prevents contagion, which seems to be communicated by the pus, or sanies, which flows from the ulcers upon the litter of the sheep-fold. But where the disease

is situated between the division of the hoof, the boot must be large enough to allow the foot to be moved in its natural way; for if the two divisions were locked together, the disease would fester instead of healing.

" When the disease is seated within the horn of the hoof, it is attended with great pain, without any visible disease. The animal does not rest upon the diseased leg, yet it has all the appearance of being well. Upon putting the hand upon the hoof it is found to be very hot, which is easily ascertained by comparing it with the sound legs. We must then endeavour to discover on what side the abscess, or interior ulcer, is. In order to do this, the foot of the animal must be slightly pressed with the thumb all round the junction of the horn, and the skin, as well as the sole of the foot. The seat of the abscess may be easily ascertained by the wincing motion of the foot. This is the place which must be cut with a keen edged knife, so as to occasion the discharge of the matter, and lay the flesh bare. When the wound has bled for some time, a feather, wet with the water of goulard, is laid upon it, and the boot above described put on.

" It sometimes happens, that upon pressing the foot with the finger, no place can be fixed upon as being the seat of the disease. This is the case when the abscess is seated below the hardest and thickest part of the hoof. In this case it is necesary to make large incisions, sometimes without any benefit, before finding the disease ; and, after waiting a day or two, the matter of the ulcer begins to appear, and eats through the horn, in descending to the sole, which then becomes painful at the place where it is necessary to make the incision. In general we need not be afraid of cutting into the quick, and bleeding the diseased feet; the horn of the hoof grows again with singular expedition. I have often seen feet which were completely unhoofed; others, of which

part only of the horn was taken away, which healed much sooner than such feet as were scarcely ulcerated.

"It would seem that in this disease the juices which administer to the reproduction of the horn, or hoof, exist in greater abundance, in the above places, in disease, than in health. When the disease is neglected, and where the sole of the foot has been gnawed off, and the whole foot ulcerated, I often found that the sides of the horn had sent out cross slips, from one side of the sole to the other, thereby becoming a sort of boot, on which the animal rested without much pain. Sometimes also the horn, in growing again, assumes uncommon shapes.

"The dressing must be repeated every day with the greatest regularity. It consists in removing the boot, and cleaning the wound with goulard water. The other feet of the animal must be examined, as well as the diseased one; for the disease often passes from one foot to another, and it is sometimes visible to the eye before the animal is lame in the foot recently attacked. Some drops of goulard water will then prevent the progress of the disease; when the disease is taken in time, five or six days are sufficient for the cure. If a good deal of horn has been removed, it will require a longer time, until the horn has grown again, and assumed sufficient consistence for the animal to walk without being crippled. As long as the least matter is perceived and the wound is not dry and cicatrized, even although the animal is not lame, it must not be thought cured, for it will carry back the contagion to the flock from which it had been separated. It must not be allowed to pasture with the rest until completely healed; and even then all its four feet ought to be bathed with vinegar for a few days, at first. Unfortunately, this malady is subject to frequent returns. I have often seen animals which appeared to be well cured, which walked perfectly well

for fifteen days, and then were again seized. Those which have already had it, so far from being less subject to it, are more exposed to it. This happens from the nature of the treatment. The remedies I have prescribed can only check the progress of the disease; and until we have discovered a purifying specific, we may often see the disease reappear on the same animal. It is of great importance to be extremely vigilant in placing the animals in the infirmary, and in taking them away in proper time. In the season when the sheep do not leave the fold, the lame ones are not easily discovered, and sometimes not until the disease is of some standing; so that the disease may have been communicated to many others, before the diseased animal is taken away. If the least degree of infection is supposed to exist, they ought to be walked up and down, every day, in an enclosure, in order to observe if any of them is lame. It is also necessary to remove them from the infirmary as soon as the ulceration disappears, because they may take the disease again from those around them. Fumigations of nitric acid are salutary for preventing the smell, and may also hasten the cure of the ulcers. The litter should also be frequently changed; and when removed, it must not be left in a place where the healthy animals are liable to be exposed to it. When these precautions are resorted to, and the care taken which I have described, there will be no danger that the disease will assume any serious appearance.

"Every thing pertaining to the knowledge of this disease, which is absolutely new in France, and, I have reason to believe, unknown in Spain, is extremely important to the proprietors of Merinos, or mongrels. I hope those who are in possession of any new facts, on the subject of the foot rot, will publish them. I obtained from a professional man of Piedmont, a succinct memoir concerning this disease. I shall here insert it."

"Sheep, and particularly those with the finest wool, are subject to a contagious whitlow, which hinders them from pasturing; and which, on account of the pain and the suppuration which it occasions, gives them a continual fever, which increases in the evening. They fall off in flesh, and lose their wool, the rams lose their appetite for copulation, the mothers lose their milk, the lambs are weak, and die of consumption.

"There are three kinds of whitlow, which succeed each other. The first is seated under the epidermis, between the two divisions of the foot; the animal is seen to halt; if we lay hold of the foot it feels hotter than usual, and it has a bad smell. Upon examining the place, an oozing out of matter is discovered. The second species of whitlow is seated under the horn. In this case the lameness and the heat of the foot are greater, as also the degree of fever. The third species attacks the phalanges, or the bones of the foot, and is caused by inattention to the two former stages of the disease. The cure of this last is very troublesome and difficult. The disease arises from long journeys, pasturing in marshy places, allowing the sheep to mix with swine, or from lying in damp folds without litter.

"*Preventives.* 1st. Remove, as much as possible, the above causes. 2. Separate the diseased from the healthy animals the instant the infection appears.

"*Cure for the first stage of the complaint.* As soon as the shepherd perceives the disease, he must dry the place affected very carefully with a linen rag, and spread over it vitriol of copper in powder.

"In the second species of whitlow, it is necessary to cut off that part of the horn which is detached from the phalange. We should begin cutting at the point of the horn, and proceed upwards. This operation must be performed by paring, successively, thin slips off the horn; when the horn is completely

removed, and the flesh bare, the receptacle of contagious matter is discovered. Sometimes it has gnawed very deep, and then the ulcer must be cleaned to the very bottom, by continuing to cut by little and little. In order to clean the wounds thus laid bare, the foot must be plunged into water, heated to such degree that we can scarcely hold the hand in it. The diseased foot must be plunged and replunged into this hot water several times, letting it remain only a few seconds, at each time, in the water. It is then dried with a cloth, and a feather, dipped in muriatic acid, is drawn over the place. The animal must be kept in a fold, where there is plenty of straw, for twenty-four hours. Next day it may be put out to pasture, where there are no stones or thorns. Every night the feet of the animals must be inspected, and if any ulcers are again formed, the treatment must be renewed. They must be always dressed in the evening, because the repose, during the night, greatly contributes to the good effects of the remedies.

"The whitlow, of the third species, is very difficult to cure. The horn must be cut, and the flesh taken off also, and the carious bone must be then scraped, and seared with a red hot iron."

"The manner of operating with the knife is extremely well described in the above memoir. The analogy between the treatment of whitlow in human creatures, and that in animals, shows how efficacious the immersion in hot water is, as recommended by the author; and the careful cleaning of the ulcers, upon which he insists, is extremely important. I entreat that intelligent agriculturists may communicate to the public their observations, from time to time, on this disease, and the best method of cure."

To the distinct account of the foot rot contained in the above memoir, nothing can be added. But the method of cure described by M. Pictet and his friend, does not seem to have been either expeditious or radical. Although M. Pictet appears not to approve

of the application of blue vitriol, yet there can be little doubt of caustics being useful in the first instance. It is probable that the tardiness of the cure was owing to the very slight dressing put over the sore. It is likely too that the cure would have been hastened by the administration of some cooling medicine internally. The following mode of treatment is humbly suggested to those who may be so unfortunate as to discover this disease among their sheep. Let the animal, in the first place, get a dose of glauber salts. The ulcer having been laid open and cleaned, it is to be washed with weak caustic ley of pot-ash,, or soda, and filled with scraped linen, dipped in oil; or, what is better, goulard cerate. The dressing of cerate is to be continued, every evening, until granulations of flesh appear to be filling up the space formerly occupied by the matter of the ulcer; and if it should be necessary, the washing with caustic ley may be repeated. Common cerate may then be applied, and should the flesh grow too luxuriantly, a little red precipitate and burnt alum may be dusted upon it. When a wholesome suppurative discharge has taken place, gentle pressure may be applied to bring the sides of the sore towards each other, taking care always to give free vent to the matter. The limb should be carefully washed with vinegar and water.* This treatment is recommended for most ulcers to

* Having lately observed one of my Merino lambs halting, and apparently lame in both fore feet, I examined them carefully and observed that the hoof was growing inward. Having pared it, I let the animal go, and it seemed to be very much relieved; but two days afterwards I again observed the lameness, and on examining the feet, I felt them very hot. I did not perceive any swelling, or oozing out of matter. I was convinced, however, that foot rot was beginning, and I succeeded in preventing its further progress by frequently dipping the feet into hot water and putting a pledget of tow, soaked with simple ointment, having a tenth part of sugar of lead mixed with it, into the divisions of the hoof and anointing the whole foot with it.

which sheep or other animals may be liable, from wounds of the skin having been neglected, or other causes.

The different kinds of matter which issue from ulcers are,

Pus, or the matter of suppuration; it is thick and yellowish white.

Sanies, is a thin green coloured matter.

Ichor, is reddish, and very acrid.

Sordes, is a gluey kind of matter.

The three last have a much more disagreeable smell than the first.

Rot.

This disease never attacks sheep on dry land. It has been observed to affect sheep which were before healthy, almost immediately on their being sent to feed on soft wet pastures. Mr. James Hogg and others assert that the rot is caused by a sudden fall in condition. As these gentlemen do not mention what, in their opinion, occasions this sudden fall, we may safely presume that it is not meant to ascribe it to any other cause than hunger. But hunger is not properly a disease, and its effects on the animal economy are very different from rot, whether the privation of food be sudden or gradual. Besides, we often hear of sheep having been buried in snow for weeks together, a situation in which they must be subjected to a sudden fall in condition, for want of food; but we never hear of sheep which have been so buried becoming rotten. This of itself is sufficient to overset Mr. Hogg's theory, notwithstanding that it is announced with an unusual degree of confidence. We learn of Mr. Hogg himself, that sheep die of the rot while in good condition, and even when very fat; and the whole account he gives

of this disease seems to contradict his ideas respecting the cause of it. Others have assigned bad and unwholesome food as the cause of rot. A sudden fall in condition may accompany the disease without having induced it. A sheep may continue to fill its belly, and yet fall off. It is the cause of the transition from fatness to leanness, and not the transition itself, that ought to be looked to. If that cause be hunger, rot will not be the consequence, but the usual effects of starvation will follow. It is well known that on healthy pastures, whether so rich as to keep sheep fat, or so poor as only to bring them into ordinary condition, the rot is not known. Soft rank grasses, whether abundant or scarce, invariably occasion the disease. Mr. Hogg says, that it is the disease which creates an appetite for such grasses, and not the grasses which cause the disease. But he has not been acquainted with the various experiments that have been made by bringing healthy sheep to graze on rank grasses ; nor with some accounts on record, of sheep travelling from one place to another, and by chance resting on rank meadows, and being almost immediately seized with the rot. Indeed it is now so well understood that rank grasses act as a sort of poison on the stomachs of sheep, that the rot is very easily avoided. All the species of rot may be reduced to one, and all the symptoms may be referred to unwholesome food. This being the case, the cure, in the first stages of the disease, does not present many difficulties. The first object is to free the stomach and intestines from their pernicious contents by means of a purgative, such as common or glauber salts, and when that is accomplished, wholesome food will most probably complete the cure. But when the disease has advanced it becomes very complicated, and has been deemed incurable. The complication of disorders, which are always observed in the advanced stages of the rot, might be expected where bad food is supposed to be the cause of it ; for this must

vitiate the blood, and different organs may then become diseased. Accordingly we find the liver, the lungs, and the whole system affected, and water is frequently found in the belly.

It is very probable that consumption of the lungs is a common disease among sheep; and that it has, in many instances, been mistaken for rot. Mr. Stevenson, indeed, has considered the lungs to be its chief seat. Cold is the most frequent cause of consumption, although inflammation may be excited by other means.

Sheep are sometimes born with little tumours, called tubercles, on their lungs; and these appear to be the original seat of the disease in them, as in the human subject. These tubercles being inflamed by cold or other means, swell and become filled with matter. Sometimes they are coughed up in this state; but most frequently they degenerate into ulcers, which spread and consume the substance of the lungs. When the lungs are affected in any case of rot, it is a hopeless business to attempt a cure, especially if they are suspected to be ulcerated. But as it may often happen that such tubercles as have filled with matter may be coughed up, mere difficulty of breathing need not deter us from attempting a cure. But the liver must be considered as the principal seat of the disease; and as it is the organ which prepares the bile, which assists digestion, we ought, by all means, to endeavour to restore it to a sound state. With respect to the fluke-worms formed in the livers of rotten sheep, their production cannot be fully explained; and it would be improper to enter into any detail respecting them here; it is sufficient that we know that they do exist in diseased livers, to be convinced of the propriety of destroying them if possible.

Purgatives are probably the most proper medicine to administer first, in all the stages of the disorder, when a cure is to be attempted.

The medicine to which we may look with greatest confidence in the advanced stages of rot, appears to be mercury. It would, perhaps, be improper to administer this internally. The safest and most effectual method of applying it, is in the form of the common blue ointment, and a trial of this is strongly recommended to those whose flocks are liable to rot. It should be applied to the bare skin on the region of the liver, and the size of a nut rubbed on till it is all dried up, twice a day, for a week or ten days. This in conjunction with wholesome food, will, in all probability, prove to be the most effectual treatment. Mercury is well known to be a specific for the diseased liver of the human body, and on that account, we may presume that it will be efficacious in the cure of the same organ in sheep, and it is also recommended as the most effectual means of destroying the fluke-worm.

The poke, or swelling under the jaws, does not appear to be a symptom peculiar to the rot. Cattle are subject to similar swellings, and in them they are often so large as to prevent the animal from swallowing. It is not improbable that the poke may sometimes have the same effect on sheep. Mercury will probably remove it. Consumption of the lungs, and the effects of hunger, seem to be confounded with the disease properly called rot, and we must wait till future observations enable us to distinguish the symptoms before a more particular account of the different disorders can be given.*

* Since writing the above, I have read the following note, p. 147. of Dr. Coventry's Introductory Discourses.

"Rot is a word which has been employed to express a variety of disorders afflicting this animal, with no small confusion and detriment. Indeed, in few instances, has senseless indiscrimination done more mischief; for means inept and injurious have been had recourse to, where skilful and timely interference would have had the happiest effects. Sheep are sometimes said to have the rot, when they labour under

Sickness, or Braxy,

Is a disease, the symptoms of which can seldom be observed till all hopes of cure must be given up. Sheep have been seen eating heartily as if in perfect health, and suddenly to start and fall down dead, and when opened immediately, the putridity of the whole carcase occasions a stench, often so intolerable as to force most people, however curious, to abstain from an examination of the body.

The disease in all its varieties is inflammatory, and from the great tendency of the inflammation to run into mortification, it may be termed a putrid disorder. The progress of the inflammation in general excites great pain, but when mortification begins the pain ceases, and thus we may account for sheep appearing well, and suddenly dying. The causes of the intestines becoming inflamed in this disease may be very various. Costiveness from eating hard dry food, drinking cold water when the body is overheated, or its being plunged into water while in that state, or suddenly drenched by rain, or chilled by a

phthisis pulmonalis which they do but rarely, or under disorders of the liver, as *hepatitis chronica*, and that state of the same organ produced or attended by the *fasciolæ hepaticæ*, *hydatides*, &c. which affections of the liver are not unfrequent. But the most common rot is still another, and a very distinct disorder, resembling, in many points, and probably the very same in its nature, with *scorbutus* in the human species, or that '*miseranda lues*,' that direful ruin of the general health and constitution, which silently supervenes from deficient or depraved aliment; and from which, as numerous observations testify, every flock, every sufferer may be recovered by simple means seasonably used; but against which, in its advanced stage, all remedies prove of no avail. Perhaps, as the last symptoms of debility are very similar, and are most taken notice of by ordinary observers, the different kinds of rot might conveniently enough pass under the names of pulmonic, hepatic, and general rot."

shower of snow, may all contribute to bring on this dangerous malady. When a sheep is observed to be restless, lying down and rising up frequently, and at intervals standing with its head down, and its back raised; and when it appears to run with pain, inflammation of some of the viscera may be suspected. Bleeding ought immediately to be performed, and not sparingly; and an ounce of glauber salts dissolved in a quart of cold water, should be administered. On the second day, a clyster of broth with a good deal of salt, should be thrown up to clear the lower intestines, and as much nitre as will lie on a shilling should be dissolved in an English pint of cold water, and given in three doses, one in the morning, another at noon, and the third in the evening. This should be continued till the animal appears to recover, and, if necessary, the bleeding should be repeated. Whatever food is given, whether cut grass, or turnips, or other succulent food, should be sprinkled with salt. Braxy seldom attacks sheep which are allowed a proper proportion of fresh succulent food during the winter.

It is of great importance to collect cases of different diseases, and to describe the symptoms, and mode of treatment accurately. Mr. Stevenson has begun this important work, and it is hoped that he and others equally capable of discriminating the symptoms, and describing the treatment, will prosecute the labour. The following are the cases of braxy which Mr. S. has collected under the name of sickness. He gives the name of braxy to dysentery, under which title his cases will also be copied.

CASE 1st.

In the month of November, the 18th, if I recollect right, 1802, a young sheep was brought

home by the shepherd, affected with sickness. The wool was clapped, the eye was languid, red, and watery. There was great heat over the body. The mouth was dry, the breathing quick, and somewhat difficult. The pulse beat frequent and strong, and its limbs seemed scarcely able to support it.

The tail was cut across in two places, when a considerable quantity of black thick blood flowed from it. As no glauber salts could be had, a handful of salt was given it, dissolved in warm water, from a tea-pot; it was put into the house, and the door shut. In about half an hour it was laid down upon some straw, and appeared very weak. On approaching it, it rose, but could scarcely walk. The tail was still dropping blood. In two hours after, it was standing, and ran away to the other side of the house when it was approached. The eye was rather more lively, the tail had ceased bleeding, and it walked without any difficulty. In two hours more, it was eating some hay that had been given to it, and the salt had purged it very freely. It was kept in the house all night; and next morning, when let out to the park at the back of the house, it eat a little. The wool was still clapped, but the eye was lively, and the burning heat was gone off the skin. The purging continued all day. It was again put into the house at night. Next morning, when let out, it seemed quite well, eat very well during the day; and next day was sent to the flock. It had no relapse.

Case 2d.

On the 7th December, 1804, another sheep was brought home, the shepherd had seen it affected in the morning, but it was not brought home till after dinner, on account of the distance. When brought home, it could not stand, which we attributed to the

tying of its feet, for the purpose of being carried home, a distance of nearly four miles.

The eye was dull, wool clapped, pulse quick and strong, mouth dry, breathing very quick, and a kind of palpitation at the heart. When the shepherd laid it down from his back, it made some water, which was red like blood.

On cutting the tail, two or three drops only, of blood, black and thick like tar, followed the incision, which, however, soon stopped. The vein on the inside of the fore leg was opened, from which also, no more than two or three drops came, of the same black and grumous appearance. The ear was also cut in the inside, but little or no blood came from it. An ounce and a half of glauber salts were given, in half a mutchkin of warm water, and an old blanket thrown over it. In three quarters of an hour, the tail was bleeding very freely, but the other places had stopt. The animal was lain down and could not rise. The pulse was quick, and it was apparently very sick. In the evening, about two hours after, it was much in the same way, only the skin was not quite so hot.

It got a little meal boiled in water, and the blanket was left on it during the night. On looking at it next morning, it was risen, but scarcely able to walk. The tail had bled a considerable quantity, and it would not eat. The wool was clapped to its body, and it still had a very languid appearance, (probably from the blood it had lost.) It got a little more boiled meal and water, and the salts had operated. In the afternoon it was eating a little boiled hay; and from this time gradually recovered, without any other application. It continued very weak for about eight days when the wool was risen to its usual appearance, and it was sent to join the flock.

As the sickness did not appear in the flock, I had no opportunity of again trying the practice at that time.

Case 3d.

In the beginning of March, however, 1804, at which time, the weather was very cold, a young sheep or hog was brought home in the afternoon, gasping for breath, pulse very quick, eye quite blood-shot, skin remarkably hot; had been observed not eating in the morning, and seemed even then remarkably languid, but made no motion as if affected with pain.

On cutting the tail across, a few drops of blood like tar, followed, but stopt immediately; the ear was cut, the neck vein was opened, the vein on the fore part of the belly, as was also that on the fore leg, from none of which above a drop or two came. A dose of salts was given, and it was covered with a blanket. On going to look at it, about an hour afterwards, it was dead. On opening the body, the fourth stomach was found mortified, over all its upper and fore part, which extended to the place where it joins the bowels, which were all quite red, as were the stomachs in a lesser degree. The internal coat of them all was very loosely attached, and the smell was extremely disagreeable; there was a reddish or livid appearance over the whole body, which arose partly from the blood not having been drawn from the animal, but more particularly from the previous inflammation that had existed. The right auricle of the heart was quite full of the same dark kind of blood as came from the incisions made before death, and the whole flesh was quite soft.

Case 4th.

On the 14th November, 1803, a young sheep was observed affected with sickness, belonging to a

friend, during the time I was on a visit at his house. He had ordered it to be killed, alleging that sickness was uniformly fatal; but was easily persuaded to try something for its relief, as, if it succeeded, it might be advantageous in cases of a similar kind.

The appearance of the sheep, upon viewing it, was by no means favourable for a trial. The wool was clapped, the eye was red, the pulse strong and full, the skin very hot, breathing laborious, with considerable wheezing, and it was scarcely able to stand. The belly was somewhat swelled, and the mouth quite parched.

It was bled, as has been described, in the tail, neck, fore leg and hind leg, belly and ear, from which there was a little blood got, of a dark colour. As no glauber salts could be had, a handful of salt was given to it, dissolved in a tea-pot full of warm water, and it was left in a house by itself. In half an hour it was laid down, and we thought it dying. On going to it, it rose, but could not walk. The tail was bleeding pretty freely, and the blood flowing from it was rather of a redder colour, the pulse was quicker, but not so strong, and the other wounds had bled a little; the symptoms were not increased, but did not seem better.

As there happened to be some salt-petre, or nitre, in the house, we gave it a tea-spoonful of it in another tea-pot of warm water; but reserved the half, which was afterwards given, at the interval of an hour, when the heat was rather less, and the skin somewhat moist. At the end of the second hour it had made a considerable quantity of water, and seemed rather more relieved. In two hours more, the salt had operated, and the wound still continued dropping. It got a large tea-pot full of meal and water. Next morning it looked much better, but would not eat. In the afternoon, however, it eat a little boiled hay, which it lived on for two days, when it was put into a park by itself. In two days more it was sent to join the flock.

Case 5th.

In the month of April, 1804, when the weather was unseasonably cold, on the 12th, a hog was brought in, affected with sickness. It was observed by the shepherd at mid-day, and was brought home in the afternoon. It was bled in the tail, from which a considerable quantity of blood came; it got a dose of glauber salts, and had two tea-spoonfuls of nitre, dissolved in a chopin of boiling water, of which it got half a mutchkin every two hours. At bed time the tail continued bleeding, and it seemed rather easier. On looking at it next morning it was stiff, having died in the night.

On opening the body, the general redness apparent in sheep dying of the sickness was very observable. The bowels were all affected, but none of them seemed to be the immediate seat of the disease, as no mortification was apparent in any of them. The flesh of the body was all of a livid hue, and the inflammation seemed to be generally diffused over it. Black clots were found in the right auricle and ventricle of the heart, and the food in the stomachs might have been rubbed between the fingers, like dry sand or chaff. There was also a redness observable in the brain.

I have had many more opportunities of making experiments upon sheep affected with sickness, a detail of which, after what hath already been said, would be unnecessary. Taking the average, however, of those that have been affected, I have been enabled by the practice laid down, to save three out of five. The proportion is even greater; but allowing for contingencies, such as their being nearly dead before being brought home, I have stated this as the proportion.

Number affected, - - -	25
Died, - - -	9
Recovered, - - -	16

Diarrhœa.

Purging seldom proves fatal to sheep. It is sometimes of service to their general health, and ought never to be stopt too soon. But this complaint sometimes proceeds so far as to bring on great debility, if its violence be not checked. When the flux is moderate, change of diet, from soft to dry food, for a few days may effect a cure. But if the purging be considerable, half an ounce of chalk may be given in an English pint of Cow's milk, a little warmed. The dose may be repeated at the end of two days, if symptoms of amendment have not appeared. If the purging be very violent, and attended by straining, the first dose should be a dram of rhubarb, and after it has operated, chalk may be given. When cured, the animal must be gradually accustomed to its pasture, otherwise the tender rich grass may occasion a relapse.

Dysentery.

This disease, which may be termed a violent diarrhœa, or looseness, is known in different places by the names, *cling*, *breckshuach*, and *braxy*. A sheep affected by it lies down frequently, and rises again at short intervals. It voids fæces very often, almost every time it gets up. It eats little, and does not chew the cud.

When the disease has advanced a little, the fæces become mixed with blood and slime. At a more advanced stage, they are black and stinking.

Diagnosis.*

Dysentery is distinguished from ordinary diarrhœa by the following characters.

1st. Diarrhœa attacks chiefly hogs and weak gimmers and dinmonts; whereas dysentery is frequent among older sheep.

2d. Diarrhœa almost always occurs in the spring and ceases about June, when dysentery only commences.

3d. In diarrhœa there is no fever, or tenesmus, or pain before the stools, as in dysentery.

4th. In diarrhœa the fæces are loose, but in other respects natural, without any blood or slime; whereas in dysentery the fæces consist of hard lumps passed occasionally; the rest being blood and slime.

5th. There is not that degree of fætor in the fæces, in diarrhœa, which takes place in dysentery.

6th. In dysentery the appetite is totally gone; in diarrhœa it is rather sharper than usual.

7th. Diarrhœa is not contagious; dysentery highly so.

8th. In dysentery, the animal wastes rapidly, but by diarrhœa, only a temporary stop is put to its thriving, after which it makes rapid advances to strength, vigour, and proportion.

9th. Dysentery is commonly fatal, diarrhœa rarely, unless the animal has been previously much debilitated.

As dysentery is frequently attended by inflammation, bleeding will be proper, and also a purge. Afterwards the following doses should be daily administered, until symptoms of recovery appear, which will be very soon. The day after the bleeding and purging, 1-2 oz. of chalk, mixed up in warmed

* Dr. Duncan.

milk. Two hours afterwards, a gill of warm water, into which has been put half a table spoonful of tincture of terra japonica and 30 drops of laudanum. The diet should consist of hay, sprinkled with salt.

Cases of Dysentery.*

On the 12th of August, 1800, a sheep was observed by the shepherd to be affected with braxy. It was brought home and put into an enclosure at the back of the house; the wool was not clapped, but the eye was languid, the mouth dry, the skin rough on being felt; frequent rumbling was heard in the bowels, the pulse felt at the neck, was quick. It had frequent stools, which had a slimy appearance, and were mixed with blood, and a few hard balls were observed to come amongst some of the stools, at each of which it drew up its hind legs, and seemed to suffer pain. As it was in good habit of body, it was bled in one of the veins in the fore leg, and about two ounces of blood, of a dark colour, taken from it. A dose of an ounce of salts was then administered, which in eight hours produced several passages; and the pain in the bowels seemed in some measure to be abated. Next day, five grains of ipecacuanha were given every two hours, for five hours, which still kept up the purging; and considerable sickness was apparent. In two hours after the operation of the ipecacuanha, it began to eat a little, and the skin was somewhat moist. The frequent stools now abated, and there was no more purging, nor was any more blood passed. In six days it was so far recovered, as to be able to join the flock.

* Mr. Stevenson; called by him braxy.

Case 2d.

On the 16th of the same month, 1800, a sheep was brought home, in which the disease had continued for several days. The stools were very frequent, slimy, and mixed with blood, having little feculent matter in them; the wool was clapped; the mouth and skin dry, the eyes languid and red; constant rumbling in the belly, and the animal could with difficulty stand. On laying the hand on the belly, it could be felt in some parts, as it were drawn together, and lumps in parts of it. A dose of half a drachm of rhubarb was given to it, which operated in eight hours several times, and brought away a quantity of fæces, more of the natural appearance, only thin; and next day eight doses of ipecacuanha were given, one every two hours. The purging continued, but not so much blood or slime, for two days, at the end of which, four ounces of logwood were taken, upon which was poured a Scots pint of boiling water. When it had stood for 12 hours, a gill, or four ounces of the infusion was given morning and evening, having 15 drops of laudanum added to each dose.

In six days the stools had ceased in their frequency, and the feverish appearance was gone off, and the animal had begun to take its food. From this time there was nothing more done to it, and in 12 days from its first being brought home, it was returned to the flock.

Case 3d.

In the month of September, 1800, a sheep was brought into the enclosure, from a neighbouring farm, the proprietor of which had before witnessed

the successful treatment of the other two cases. The disease had continued twelve days, and the animal was very much exhausted. The wool was clapped, and a very considerable quantity of blood was passed at each stool; the mouth and skin were dry. It took no food, and the pulse was quick. A dose of salts was given to it, (an ounce,) which operated well. Next day, four doses of ipecacuanha were given, of four grains each, which also operated, and by which the purging stopt for six hours. There was no appetite, and a number of hardened pieces of fæces were passed, mixed with black blood. The heat of the body continued. Two ounces of logwood were infused in a chopin and a half of water, and given in the quantity of a gill three times a day, with the addition of fifteen drops of laudanum. This was continued for four days; during which time, however, the blood still continued to be passed, with an admixture of a substance like the matter of an ulcer, and on the 17th day from the first attack the sheep died.

On looking into the belly, the bowels had all an inflamed appearance, and a considerable proportion of the lower intestine was ulcerated in the inside; its coats were thickened, and its outside was of a blackish hue. There was a quantity of fœtid air in the bowels which turned a silver probe quite black, as it did also a shilling exposed to it. The flesh was soft and red, but the heart, liver, and brain, were sound; the kidneys were slightly enlarged and flabby.

Case 4th.

In August, 1800, a sheep was brought home, affected with braxy; the symptoms were as formerly described; it seemed much exhausted, and had been observed affected for seven days. It got first four

grains of ipecacuanha every two hours, three times, which purged it a good deal. It was then placed in a small house, where was a large cast iron boiler, which being filled with water, and the door shut, from the heat of the furnace below, it soon filled the house with steam, in which the sheep continued for the space of three hours, when the fire was taken away, and the sheep remained in the heated house all night. There was a great perspiration over its body, and the wool was quite wet. It was taken out at mid-day, and the infusion of logwood and laudanum given to it three times a day. It seemed a little better and the stools not so frequent. Wool still clapped. Next night it was shut up, and stoved again, and some flour porridge was given to it, with a little milk. Next day the medicine was continued. The symptoms had abated, but the wool clapped; it was not again stoved, and the medicines were continued for twelve days before it was quite recovered.

Case 5th.

In this case the treatment was the same as in the first and second cases; but there was such a degree of debility that the porridge and astringent medicines were continued for nearly four weeks before it was recovered.

Case 6th.

In August, 1800, a sheep was brought in with braxy, the symptoms very violent. It had a dose of salts, which operated, but it died next day. In this case the bowels were affected considerably higher up, being at the junction of the small and great guts,

where mortification had taken place. The lower bowels had a number of round hardened balls in them, and a very disagreeable smell was exhaled.

I deem it unnecessary to mention any more cases, which all occurred in the same year, as braxy has not appeared since 1800, and I have had no opportunity of making experiments on it since that time. The practice in that year was very successful, as five were saved out of seven that were brought home, and a fair trial instituted: but, from carelessness, nearly one out of three died before any thing was done to them.

Pinding

Is a disease incident to lambs; or rather is the effect of a degree of purging which sometimes attacks them when very young. The fæces being of a gluey nature, fix the tail upon the anus, and thus all passage from the bowels becomes interrupted. Docking prevents this from happening. The ewe-lambs should be docked a day or two after they are born; but from the consideration to be found under the article castration, it is advisable not to dock the males till they are cut, unless they should happen to be pinded.

Inflammation sometimes attacks lambs in the *bladder* and *intestines*, and proves quickly fatal. When the intestines are inflamed, the disease is called the *grass ill.* The *louping ill* has not been sufficiently attended to, nor well described. It is thought to be a paralytic affection.

The *thwarter ill* is so variously described that Dr. Duncan has thought it necessary to divide it into species. But from the description given, it is impossible to find out its nature. It appears to come near to apoplexy, and to palsy, and some symptoms,

as locked jaw, and wry neck, bring it near to tetanus, or universal spasm.

It is best to refrain from attempting to describe diseases which are not understood, and to be contented with expressing a hope, that some medical person, in the district where such diseases are said to prevail, will observe them, and describe them carefully.

Staggers

Seems to be a convulsive affection. The animal which it attacks, trembles, falls down, and rolls and twists itself about. Copious bleeding has been found to cure it. The causes are not yet known. Mr. Stevenson ascribes it to the deleterious effects of poisonous grass, and recommends a change of pasture as the only cure.

What is called *vanquish*, or *vinkish*, has not been fully described. It seems to be a decline, and is cured by change of pasture.

Jaundice

Is a rare disease. It is known by the skin and eyes becoming of a greenish yellow colour. It is occasioned by the rupture of some of the vessels secreting the bile, or conveying it to the stomach and intestines. The bile being diffused through the body, causes the colour peculiar to this disease. Bleeding is useful; and a dose of jalap, with perhaps a few grains of calomel, will be of service. Exercise is very efficacious.

PART IV.

ON THE MANAGEMENT OF SHEEP.

Shelter.

Shelter is the first thing to be attended to in the management of sheep. While every good shepherd is decidedly hostile to their being confined, or to their being forced into shelter, whether they wish for it or not, it cannot be too strongly recommended to all sheep farmers, to put the means of avoiding the severity of stormy weather within the reach of their flocks at all times. Close confinement injures the health of all animals; and is hurtful in an especial manner to sheep, which, by nature, are of a roving disposition, and exceedingly fond of liberty. It is certainly a mistaken notion that fine wooled sheep are more tender, and more liable to be injured by cold, than those which carry coarse fleeces; and that they must, during the greatest part of the year, be kept in cots, as is practised on the continent. The wool of the fine breeds grows in a manner which renders it more effectual in resisting the rigours of winter, than that of the coarse kinds. The experience of several persons who have introduced the Merino sheep into the Highlands of Scotland, seems to hold out the happy prospect of animals carrying the most valuable wool being seen dispersed over the whole kingdom. The perseverance of Sir John Sinclair has taught us that the Cheviot Sheep are perfectly well adapted

for the climate of the most northern parts of Scotland.

Merino sheep, which have been reckoned the most delicate, have been found capable of bearing very great degrees of cold, without being injured in the slightest degree. Cold, therefore, is not by any means an object of dread to the breeder of any kind of sheep, except during the lambing season, when sudden and severe cold, and chilling rains, are, with reason, to be feared by every storemaster, as they are fatal to newly dropt lambs of every breed.

Drifting snow, excessive rain, and great heat, are the enemies which, in our climate, chiefly annoy our flocks.

Drifting Snow.

Natural shelter is seldom to be found in a mountainous country, so convenient as to be proof against sudden storms of snow. Recourse must therefore be had to art. There cannot be a better method of enabling sheep to escape from drifting snow than such enclosures as are mentioned by Mr. Hogg. Circular enclosures, surrounded by a wall of turf, will be fully as effectual as those constructed of stones, and will in most places be more economical, both in the original cost, and subsequent repairs. The spaces enclosed should be ample, and on dry ground. If the walls are built with turf, the base should be four feet thick, and the top two feet. The height should not be less than six feet. Two or three openings should be left towards the south; and a drain so constructed as to take off the wetness of the ground, rain water, and that from melted snow, should be dug round the outside, communicating by holes in the wall with the inside of the enclosure.

After having been once or twice driven into these enclosures, or rings, the sheep will of their own accord draw towards them on the approach of snow.* The shepherd will always find his flock assembled in the rings during snow, and he will not often have to risk his life by searching for lost sheep among wreaths. Clumps of Scotch firs have been found of great use on some farms; and now, when the rents of sheep pastures have become so great, (it may be said extravagant,) it is probable that sheep farmers will insist on some stipulation being made in their leases for plantations. It cannot be expected that tenants are to be at the expense of planting trees, which will only begin to be useful when half the period of the duration of an ordinary lease has expired. Plantations require time to grow, and some care and expense for their protection when young. It is needless to enter here on the subject of leases. It is enough to observe, that to ensure the prosperity of a tenant, and the security of a landlord, they should both be liberal, and inclined to accommodate each other.

In gentlemen's parks, and on low grounds, where attendance can be constantly afforded, there is less occasion for shelter. Clumps of trees, especially of spruce fir, the foliage of which is closer and more ornamental than that of the Scotch pine, will, however, be found extremely useful. Dry knolls should be chosen for them. There is one objection to all the pine tribe, that their leaves do not so quickly rot on the ground as the fallen leaves of other trees, which form soil and encourage the growth of grass. The prickly leaves of the pine may also hurt the fleeces. These considerations are of less importance than the safety of sheep; at the same time they may, in some measure, be obviated by planting firs

* Walls are raised in some places in the form of a cross, or of the letter S.

only on the outside, and filling up the clump with birch, a tree which grows quickly and thrives in very thin soil.

As it is necessary in some situations to confine ewes with their lambs during night, in order to defend the latter from foxes and dogs, it becomes requisite to construct cots and folds. The former should be airy, at the same time sufficiently close to prevent bad effects from rain or snow, and the latter should be spacious. Cots may be very easily and cheaply constructed after the manner of Highland cottages, where birch trees, or others having a natural bend, or branches of large trees, can be got. The frame-work is constructed as follows: Two trees, or large branches, are laid together, so that the distance between the thick ends may be 12 or 14 feet. The small ends are then morticed together and fastened with a wooden peg. About four feet below this a piece of wood is laid across, morticed and fastened; the ends projecting about a foot on both sides. Small projecting pieces are also fixed at the height where the roof is to begin. These parts are now called couples, and when a sufficient number have been prepared, they are set up at the distance of ten feet from each other. They are now joined together at top by straight trees being laid along into the forks made by the crossing of the ends of the couples. Similar pieces are laid along the sides resting on the projections, and the whole are fastened by means of pegs, similar to what ship carpenters call tree nails. To form the roof, small straight trees, usually birch or Scotch firs, are laid across the rails, the thick ends being nailed to the lowermost rail. A rail is also fastened along the inside of the couples near the bottom. On this and the lower roof are nailed spars, which are placed close together, but not so as to exclude a free circulation of air. In the front, spaces are left open at intervals. The thatch consists of heath, which is

the most durable of all others. There is some art required in laying it on, although the operation appears to be very simple. The first layer consists of heath, having the thick roots cut off, and nicely arranged and fastened down by long pieces of wood tied with willow twigs to the frame-work. The heath is then laid on without regard to the roots, except having them inmost. The thatch is laid on thicker and thicker towards the top, where it is fastened by means of thin sliced turf laid along. The whole is distinctly seen in plate 5th, which represents the frame-work, and the appearance of a cot which has been constructed as already described. Moveable cots may be made with frames filled with straw, or heath, by means of wicker-work; the sides being made of wicker-work alone.

Rain.

As it is impossible to shelter even small flocks from rain, it is a fortunate circumstance that sheep are not very liable to suffer from it. During summer there is no danger to be apprehended from long continued rain drenching the fleece. But should this happen during winter, weak sheep will most probably suffer greatly. Attention to the health and comfort of sheep at other times, by bringing them to face the severity of winter in a strong habit of body, will be found to be the best method of defending them from rain.

Heat. Flies.

In mountainous districts, sheep have it in their power to remove from glens and hollows, where the

rays of the sun frequently become oppressive. But on low grounds they are too often left exposed, without having access to a shady place, to the scorching heat of summer, and to the torments inflicted by myriads of flies. The shades of trees, cots and walls, are sufficient to enable sheep to avoid heat, but their enemies will follow them, and continue their attacks. Some method of keeping off flies must, therefore, be adopted; or, at any rate, of destroying their eggs, which they deposit about the roots of the horns, and other parts of the head, and about the tail. The following ointment being rubbed about the roots of the horns and tail, will be found to be of great use.

Strong mercurial ointment, 1 part.
Rosin, ... 1 part.
Hog's lard, ... 3 parts.

Melt the hog's lard in a convenient vessel, and add the rosin. When these ingredients are well incorporated, add the ointment, and stir the whole well till it becomes cold, to prevent the mercury from sinking. The rosin is intended to give some degree of adhesiveness to the composition. The smallest particle of mercury is fatal to an insect. A composition for defending the bodies of sheep will be found under the article *shearing*. Flies seldom become troublesome till after the time of taking off the fleece. But when sheep appear to be annoyed before that time, the ointment should be applied without delay to the head and tail, and well rubbed on. The proportion of mercury is too small to have any effect on the animal, but is quite sufficient to make flies change their scene of attack; at any rate to destroy their eggs. Rubbing the head and tail with a composition of one pint of tar and four of train oil, has been found to answer the purpose well.

Food.

Variety, or frequent changes, in the nature of food, tend to derange the uniform action of the bowels, and to bring on diseases which often prove fatal. During summer and winter, sheep are commonly healthy, when they are not absolutely starved. It is chiefly spring and autumn when they show symptoms of bad health. Sudden changes in the quality of their food, are the causes of the general unhealthiness experienced at these seasons of the year. Such alterations are not more injurious than quick transitions from plenty to scarcity, and from scarcity to plenty. When an animal has been highly fed, and accustomed for a length of time to eat regularly, any sudden alteration in its habits soon occasions disease. On the other hand, nothing is more dangerous to an animal which has been starving, than placing it all at once in the midst of plenty.

A shepherd, when about to choose a farm, should regard uniformity in the kind of pasture, rather than whether it be rich or poor. In noblemen's and gentlemen's parks, where the grass is what is usually called artificial, and consequently as uniform as it is possible for pasture to be, few diseased sheep will ever be found. On meadows and hills, where some parts are moist, and others dry, and where the soil is of different kinds, the quality of the pasture is often found to vary much. Here the only way to avoid risk is to adopt the plan of many skilful shepherds, and to allot different tracts of country to different parts of the flock. There can be no difficulty in dividing a farm in such a way, that the wethers may always be on the same ground, and the ewes on their own walk. Sheep cannot endure frequent removals; but are strongly attached to the place of their nativity. Lambs must be moved when about to be weaned, but ought never to be herded by them-

selves. When taken from their dams, they should be sent to graze with the wethers. With them the wether lambs may continue, and the ewe lambs should be restored to their mothers as soon as their milk is gone. If necessary, the ewe hogs must be removed from the old ewes during rutting time.

It has been fully ascertained that wet grounds, where waters sometimes stagnate, are unfit for sheep pasture, insomuch that the complicated and fatal disease, called rot, always attacks sheep which feed on them. Wet peaty ground is not so dangerous, nor is there much risk when sheep go on land over which water trickles constantly. But lands which have been flooded are not safe until they become perfectly dry. In the Highlands of Scotland there are vast ranges of hills, which, even during the dryest seasons, are continually moist; yet they do not appear to be injurious to sheep by bringing on the rot. On these the water is in continual motion, and never stagnates.

The neighbourhood of stinking pools of water, and of grounds on which rank grasses grow during the evaporation of stagnant water, should always be avoided. Sheep are fully as liable to the rot in such situations as the human species is to ague, and other diseases resembling incipient rot.*

The greatest difficulty in the management of sheep occurs at the periods when the seasons change. Then it becomes necessary on hill farms not only to diminish the quantity of food, but to give it of a different quality. On the mountains of Scotland the vegetation of the grass and heath usually ceases about the end of October. When sudden frosts come on before the vegetation of the grasses has stopped, the leaves are affected, so that when thaw commences, they become flaccid, and rot. When

*Some interesting particulars connected with this subject are to be found in a pamphlet on the rot, by Dr. Harrison.

introduced in that shape into the stomach of a sheep, or of any other ruminating animal, they will probably prove injurious. When sheep are forced by a sudden fall of snow to relinquish their ordinary succulent food, the change can hardly fail to hurt their health. Their stomachs and bowels, having been accustomed to the gentle action required for digesting succulent food, are not in a condition to manage what is dry. The slow digestion of dry food makes an alteration in the quantity of fluids secreted, and the whole system is apt to be deranged. The grand object of a shepherd, therefore, ought to be, to make the change of food as gradual as possible. He must not be tempted by fine open weather to delay accustoming his flock to an alteration in diet. Winter may come on suddenly, and before the shepherd be aware of them, bring difficulties which he may not be able to overcome. When a continuation of succulent food cannot be afforded, a wise and skilful shepherd will begin, about the end of October, to move his sheep about, taking them sometimes to dry, heathy grounds, and sometimes to places where the pasture resembles that destined for winter use. By daily driving them backwards and forwards, the sheep will not have their usual allowance of time for filling themselves; and thus they become, by the same trouble, fully prepared for a change both in the quantity and quality of pasture. The movements should be continued until the usual time for putting the sheep on their wintering ground. The same caution ought to be observed in spring. During winter, the stomachs of the sheep will have acquired a stronger action in digesting dry and hard food. If in this state, they be suddenly filled with young succulent grass, purging will be brought on; and probably more fatal diseases than diarrhœa, will attack the flock. In situations where turnips, or hay, can be raised in sufficient quantities, many dangers

and difficulties may be avoided by a proper alternation of these as winter food.

The winter management of a breeding stock, and of a stock for the butcher, are very different things; and yet we see many people treating both in the same way. While sheep, destined for the knife, are folded on turnip fields, it would be folly to risk great ewes, or young sheep, in the same manner. In such a situation, great ewes are very liable to miscarry; and both these, and young sheep, from being obliged to lie dirty and wet, often become unhealthy. In general, the animals destined to pass the winter on turnips, are compelled to eat up every morsel; even unwholesome, dirty and rotten husks, which they had before left in disgust. But as butchers have no objections to take sheep a little rotten, or otherwise diseased, while they are rather disposed to be fat, this, in the opinion of many, may be of no consequence. But such treatment is highly improper for a breeding stock, for which no one should grudge the trouble of carting turnips to a grass field, or to a cot, should the weather render it necessary.

It is very improper to fold sheep during the night without giving them food. They eat almost as much during the night as during the day, and seldom go regularly to rest. They lie down to chew the cud and to rest during the day, as well as the night time. Were the natural habits of domestic animals more attended to, there would be little occasion to trouble the breeders of them with books.

Smearing or Salving.

Shepherds vary in their answers when asked why they smear their sheep. Some say that it is intended to prevent the scab; some to cure it; others say it is for the purpose of keeping off rain; and some

assert that they do it merely to soften the wool. But it cannot be denied that a great many shepherds have none of these objects in view; and that they bedaub their sheep with tar, in order to make the fleece weigh well; in other words, to cheat the wool merchant. Smearing with a proper composition is certainly useful in many cases, both to the fleece and the animal which carries it. It destroys vermin, and softens the wool of the cheviot and southdown breeds particularly. It has very little effect on coarse fleeces; but as they are long and do not curl so much as the short sheep's wool, smearing may be useful in defending the animals from rain. It is for this purpose that black-faced hogs are smeared. Some breeds of sheep yield a great deal of oily matter, which keeps the wool always soft. On such sheep too, a larger quantity of the substance called yolk, is found, than on the coarse breeds.

Nothing is so hurtful to wool as tar, in so far as the interests of the manufacturer are concerned; and nothing is more apt to injure sheep, as it is of a very irritating nature. It is to be regretted that the interests of the wool-grower and of the manufacturer are not considered the same. The care which attentive shepherds bestow on wool, is amply repaid by the health of their sheep, and the price they receive. When used with moderation, tar is a very useful ingredient in the composition for salving. When laid on in a large proportion, it quits the grease with which it was mixed, and accumulates on the sides and bellies of the sheep. Tar is always so full of impurities that it spoils the colour of the wool, and renders scouring a difficult, tedious, and expensive operation. It is therefore the interest of the grower to seek for a composition into which tar enters, which will have all the effect he desires in smearing; and from its being more easily washed out than the common composition, will enable the manufacturer to afford a better price for the wool on

which it has been laid. The following composition will be found rather better than that in common use in the north. There is nothing new among the ingredients; the only novelty is in the method of preparing them. These should also be of the best quality. Of the different kinds of tar, the American is to be preferred; and the Archangel thick tar to be avoided. What is of a light brown colour when rubbed on a piece of wood is the best.

Take of train oil . . . . . 2 quarts.
of tar . . . . . 4 do.
of butter, or hog's-lard 24 libs. Dutch.

Put the train oil into a pot over the fire, and when it has become pretty hot, put in the tar by small quantities at a time, stirring well with a flat wooden spatula. When the oil and tar are hot, remove the pot from the fire, and allow them to settle for about a quarter of an hour, and then pour off the clean part, leaving the sediment carefully. If butter is to be used, it must be purified in the same manner, and added to the tar and oil, and well mixed.—When the whole has been allowed to rest for a quarter of an hour, it may be poured into the vessel in which it is to be kept for use, when an additional quantity of sediment will be obtained. If well made, the composition will, in the course of twelve hours, acquire a proper consistence, and be transparent like a dark-brown jelly. When laid upon the fleece it spreads uniformly through it, and the tar does not separate and clot the wool. This stuff has been tried on a considerable number of cheviot and southdown sheep, and has fully answered the expectations formed of it. At any rate it can be safely recommended as better for the sheep and for the wool, than the ordinary composition for smearing. Hog's-lard is in every point of view preferable to butter. When it is used, it is not necessary to purify the tar separately. The larger the quantity of stuff which is prepared at once, the better. A deep pot should be used.—

From American tar, a sediment, immiscible with oil, will be obtained; it resembles pitch in appearance. For the finest wool, which is always supplied with a large proportion of oily matter, salving is unnecessary. But as the animals which carry it are, alike with other sheep, infested by vermin, they may be relieved from a great deal of torment by the moderate use of some composition which will not hurt the wool in the eyes of the manufacturer. The arsenic water mentioned in another part of this volume, may be used; or a composition of four parts hog's lard, and one of oil of turpentine. The usual time for smearing is about the end of October, or beginning of November, when the wool is about half-grown.*

Washing.

In order to put wool into a more marketable condition, it is usually washed on the back of the sheep before it is shorn. The animals are made to swim once or twice across a river or pond. This practice does not appear to be apt to injure sheep of any kind; although danger might be apprehended from plunging nurse-ewes into cold water. Washing is very little attended to in Scotland, and the only sheep that undergo this operation are of the Cheviot breed. As the fleeces of fine-woolled sheep are not easily penetrated by water, so they take a long time to dry. Washing the wool on their backs may therefore be improper in some cases. The only objections to washing fleeces off the animal, is that it is apt to derange them, so as to render the operation of stapling,

* I am about to try a new stuff for smearing, which promises to answer every good purpose, and is very cheap. I shall communicate the result to the public.

or sorting, difficult. The following simple method of cleansing fleeces removes this objection, and cannot be accused of being expensive. Figure I, plate 5th, shows the profile of a stage standing in the water, at the edge of a stream or pond. The extreme length is eight feet. The breadth of the stage is four feet. A B is a platform, moveable at the joint A. It has a moveable support D, to which a cord C is attached and tied to the handle E, for the purpose of pulling up the support when the platform is to be let down. When down, the platform, which is full of small holes, is made to rest an inch and a half below the upper part of the frame. In this situation it is covered by the water. A fleece being spread out upon it, is well soaked, and a person treads it till as much of the filth as the water will carry off, is removed. The treader then steps back upon the stage, and taking hold of the handles, raises the platform and fleece out of the water. He now takes a flat piece of board, fig. 2d, and presses the water out of the fleece, after which it is carried carefully and spread upon grass to dry.* When perfectly dry, it is rolled up in the usual manner. In situations where the bed of the water is not very steep, and smooth, small wheels will be found the most convenient support for the stage.

Shearing.

This usually begins with the month of June. There is no part of their business in which common shepherds appear so slovenly as in this. They usual-

* If the fleeces be previously soaked in a weak solution of alkali, or of soap, or in stale urine, the cleansing will be more perfect. For more expeditious drying, a press may be used; but there may be some risk of the pressure felting the wool.

ly mangle the fleece, and leave the sheep's backs covered with tufts of wool, to the great loss of their masters. The closer wool is clipped the better. It would appear that some sheep which carry the finest fleeces, do not naturally shed their wool annually; but ordinary sheep do, and ought to be shorn just before the wool begins to separate. Neatness in shearing can only be acquired by practice. The only rules which can be written are, use shears of a moderate size, and take up very little wool between them. Perhaps it would be an improvement that the shears should have blunt points, which may prevent many accidents, and render the operation easy and expeditious, by giving confidence to the shearer, that he is in no danger of wounding the sheep. After being shorn, sheep are much exposed to the tormenting attacks of flies and other vermin. They should be carefully examined, and all keds, ticks, &c. picked off. The following unguent should then be well rubbed on every part of the animal. The roots of the horns may be anointed with the composition mentioned under the article heat.

Take of train oil . . . . 4 gallons, English.
of tar, ... 1-2 gallon, do.
oil of turpentine, 1 pint, . . . do.*

Dr. Parry recommends the shearing of fine wooled lambs about the beginning of August, having found that the hog fleeces grow finer, when the lamb fleeces have been removed. This practice promises considerable profit; an argument in favour of its adoption, of a very powerful kind. There does not appear to be any danger to be apprehended from the operation at that season of the year; and the wool will have time to grow to a sufficient length, for defending the animal from cold, rain, and snow, before

* Instead of the tar and turpentine, what is called the spirit of tar may be used, while the oil of turpentine continues to be so high priced.

winter sets in. The Doctor has attended more than any person in Britain to the subject of wool-growing, and has shown very superior judgment in conducting his experiments. His recommendation goes no farther than to fine wooled lambs; but those of other breeds cannot be hurt, if these do not suffer any injury from the operation.

At the time of clipping, and indeed at all other times, when the flock is collected, every individual should be carefully examined; and any wounds or sores should be cleaned and dressed. The feet should be looked at, and every animal which has swelled or ulcerated limbs, should be separated from the flock. These, and all others which seem to be sickly, should be kept at home until cured. Sheep ought to be collected and examined more frequently than at the usual stated times.

Yolk of Wool.

Until the experiments of that excellent chemist, Vauquelin, were published, the nature of yolk was unknown. He has found it to be an animal soap; and has observed that wool which had remained a long time in its own yolk, swelled up, split, and lost its strength; effects which take place also in too strong soapy water. "If," says M. Vauquelin, "the water of yolk causes wool to swell, and to split in this manner, may it not be possible that this accident often takes place on the backs of the animals, especially during damp, warm weather, or when they are shut up in folds, the litter of which is not often enough removed? It may not be impossible also that the acridity of yolk may occasion an irritation in their skin, and prove the cause of some of those maladies to which this organ is subject in these animals, and which must occur chiefly during damp warm wea-

ther: fortunately at this season they are occasionally exposed to rains which wash them and carry off at least a part of this matter. In this respect I am inclined to adopt the opinion of those who think that the washing of sheep, during dry warm weather, may be useful to their health, and to the quality of the wool."

Although every respect is due to so good a chemist as M. Vauquelin, he could not have formed his opinion of the effect of yolk on the skin of sheep but from analogy. As common soap is often used with success in cleansing the skin, and curing cutaneous disorders, analogy would lead us to expect that yolk, being of the same nature, would be beneficial instead of being injurious. And it is observed, that fine wooled sheep are less subject to diseases of the skin, than those which carry coarse fleeces; the former being well supplied with yolk and oil, and the latter having drier wool and little yolk. M. V. thinks yolk a naturally perspired matter; but it is more probably a combination of the salt in sweat, with the oil of wool.

Putting Rams to Ewes.

The period, during which the rams are to go with the ewes, must be regulated by climate, and the quantity of spring food provided. It is of great importance that lambs should be dropt as early as possible, that they may not only be well nursed, but have time to get stout, and able to provide for themselves before the winter sets in. It is also of advantage to the ewes, that they may get into good condition before the rutting season.

To secure a full crop of lambs, a proper proportion of tups should be employed, viz. 4 to 100 ewes. They should be left together only so long, that no

lambs may be dropt after the middle of May; unless in the case of rearing lambs for the butcher, when matters may be regulated according to circumstances.

A good deal of attention on the part of the shepherd is necessary during rutting time. It frequently happens that a tup will drive a ewe which is in season, out from the flock, and stand by her for a long time, for days even, without doing his duty. They should be separated as far as possible from each other. Sometimes a tup will follow a ewe not inclined to receive him, for a whole day, while others in season will in vain solicit his attention; nay, he will often be so ungallant as to beat them off. In this case separation is also necessary.

Some people rub the breasts of the rams with some pigment, and remove every ewe which has any mark of it as having been served. This, however, is a practice which may occasion much disappointment, as tups often leap without accomplishing their purpose. Both tups and ewes should be in the best possible condition.

Dr. Parry mentions a mode of putting the ewes to the ram, which he believes to have been invented by Bakewell. At the intended season of copulation, the sexual appetite of the ewes is provoked by a ram, *cui venter et genitalia panno circumteguntur, quo minus oves ineat.* The ewes which are ready being thus discovered, are brought in succession to the proper ram, which is kept in a yard, or small enclosure, and is allowed to serve each only once. In this manner, a shearling ram, well fed, may be sufficient for 100 or more ewes in one season. This method is certainly to be recommended where any one ram is greatly superior to others in make, and other desirable qualities, relatively to a large number of ewes.

Great Ewes

Should be moved about as little as possible; and kept from wet ground, dirty cots, and from every think apt to injure their health, or disturb them. They are, when heavy, very liable to get awald;* and when the shepherd discovers them in this situation, he should approach them with caution, and lift them gently. When a ewe has miscarried, it will be proper, if the weather be severe, or very cold, to bring her into a cot, and to keep her there till recovered; but during mild dry weather, she will be as well in the open air. When about to yean, the ewes should be on the smoothest and driest ground, both for their own convenience, and that of their lambs when dropt. Nurse ewes should have good pasture, which should not be changed, while they give suck.

Lambs,

When observed to drop on a place where they cannot easily rise, should be lifted and placed on their feet, but otherwise they may be left to themselves. They may be docked when a day or two old, which saves much trouble when the disease called pinding attacks them. Docking makes them look very lively, as, while they are at their frisking time of life, their stumps have commonly a set or cock. The tail, which seems to be a useless and inconvenient appendage, need not be left longer than three inches. But this operation in the males, if pinding does not happen, should be deferred until the time for castration. Ewes which have been docked,

* The term used in England is *cast*, which is better and more expressive than the uncouth word used above.

are not liable to lose their lambs by their being entangled by the tail at birth, an accident which happens much more frequently than shepherds are aware of.

Lambs that are in health are always lively. Such as do not appear to be inclined to sport with their fellows should be looked at, and also their dams. Ewes which appear unkind to their lambs should also be examined. In these cases something will in general be found to be wrong. Distorted, or imperfect lambs, should be sold, or killed for home consumption.

Weaning Lambs.

Lambs should be allowed to suck during three months and a half, after which they may be taken up, and kept for a fortnight or three weeks at a distance from their dams; far enough from them to prevent their bleating being heard. The lambs will soon begin to feed heartily on grass, especially if they be allowed to go with the wethers.

Many are in the habit of milking their ewes after the lambs are taken up. It may be proper to take the milk from them once or twice at the interval of two days; but it is a bad practice to milk them for a length of time, as this hinders their getting into good condition before the rutting season.

Vermin on Lambs.

In the event that lambs become troubled by vermin before smearing time, the following directions of Dr. Parry will be found useful. The *hippoboscaovina*, or

tick, is extremely injurious to sheep, by making the animal bite and rub itself, so as not only to hurt the fleece, but to break the skin; in consequence of which the fly is apt to fix on the wool near the wounded part, and there deposit its eggs. This troublesome animal may be, in a great measure, destroyed by pouring a solution of powdered white arsenic in boiling water, in the proportion of an ounce to a gallon, cold on the back of the sheep, and letting it diffuse itself down the skin on each side: in this method, however, several of the ticks escape by crawling to the extremities of the filaments. It will be still better to wash the lambs in the autumn, whether shorn or not, in a tub of a similar mixture. For this purpose, three pounds of the same arsenic, powdered, may be dissolved in six gallons of boiling water, and the solution mixed with 40 gallons of cold water. The whole being then well stirred with a stick, the lambs may be plunged into it, great care being taken that they do not dip their heads, or taste the water. The liquor must be squeezed out of their fleeces back into the vessel, in order that it may not be wasted. It is scarcely *necessary* for me to point out the poisonous quality of this liquid, and how important it is to keep the vessel locked up, and after the operations are performed, to clean it well; or, rather, never to use it for any other purpose; and to throw the liquid which remains where not the smallest quantity of it can be drank by any creature whose life we value.

Salt.

There are so many facts on record exhibiting the utility of salt when mixed with the food of sheep, that the impossibility of procuring that article for the flocks of Great Britain is much to be lamented.

Lord Somerville has proposed chalk as a substitute; but his Lordship was not aware that its qualities would prove rather injurious than beneficial. Chalk operates as an astringent, and is accordingly found to be very useful in some diseases. Salt may possibly correct acidity; but it does not act as an absorbent, like chalk or magnesia. If common salt was to be decomposed in the stomach, by the acid there combining with its alkali, the muriatic acid would be freed, and would, in all probability, do more mischief than an excess of bile. It is evident that chalk will not act in the same manner as salt; and from every consideration of its known effects on the stomach, it is probable that it will not answer the same purpose.

DESTRUCTION OF FOXES AND BIRDS OF PREY.

Notwithstanding the very great losses which are annually experienced from the ravages of foxes, eagles, and other birds, little ingenuity has been exerted to devise means of destroying them. It would be better for sheep-farmers to have fox-catchers than fox-hunters; and with very little trouble every one of their shepherds may be made much more useful in destroying these animals than the ordinary fox-hunters, and that without interfering with their attendance on the flocks. Nothing more is required than to put the means into their power, and to hold out some reward proportioned to their success.

Various pit-falls might be contrived for taking foxes; but poison is the most effectual instrument of destruction when properly employed; both for foxes and birds of prey. Of the different poisons used for killing vermin, arsenic and corrosive subli-

mate are the most powerful. Whoever chuses to adopt the following method of using them will not probably have any cause for seeking a better one.

Take the carcass of a sheep, and having removed the skin, fasten it to the ground in some open place with the back uppermost. Make cross incisions into the fleshy parts, so that the squares made by the cuts do not exceed an inch and a half. Separate each piece nearly from the bone, but not altogether. Then make one or two punctures with a pen-knife, an inch and a half deep into each piece, and fill them nearly full of a mixture of equal parts of corrosive sublimate and arsenic, previously made into a paste with honey. Put all the squares into their natural position, and leave the place.

When a fox, or an eagle, or a parcel of ravens, or crows, attack the carcase, they will not find much difficulty in tearing off the flesh; and in the hurry of competition for the largest share they will gobble up the poisoned pieces entire, and soon die. When a carcass is poisoned without cutting it as here directed, the poison is apt to be lost while the animals are employed in tearing off the flesh. By fastening the carcass to the ground, the pieces of flesh will come easily off.

Should the shepherd be anxious to catch the animals, let him fasten a good strong fish-hook of a moderate size in each piece of flesh, which must, in this case, be entirely separated from the bone, and need not be poisoned. By fastening the hooks to the ribs of the carcase by means of strong wire, both foxes and eagles may be caught. The common pike hooks will answer very well, but a much smaller size will do for birds. Shepherds must take care to keep their dogs out of the way; but if any strange cur should be prowling about in search of a lamb, or a leg of mutton, and stumble upon the baits, he will meet the fate he deserves. It will be proper to select for the baits places where sheep do not feed,

such as bare moss, or gravel, or some banks at the sides of streams.

MEDICINES MENTIONED IN THE FOREGOING TREATISE.

Ammonia or *Volatile* salt, is a strong stimulant, and has been found useful in cases when any poisonous substance has entered the stomach.

Chalk. This is an absorbent earth, and is very useful in correcting acidity, and this removes the irritation of the bowels, which occasion looseness. It is also astringent. It requires to be purified by washing.

Goulard water, and cerate. When either the extract of lead, or sugar of lead, are mixed with water, a little vinegar should be added. The solution is a valuable application in superficial inflammation, and bruises, and diseases of the skin. The sugar of lead is better for the shepherd to keep by him than the extract. A drachm of this may be dissolved in an English pint of water, with a table-spoonful of vinegar. The cerate is easily procured.

Jalap, is a safe and effectual purgative, but few occasions for using it will present themselves.

Ipecacuanha. This acts as a stimulant to the stomach. In repeated *small* doses it is very serviceable in dysentery.

Lime-water is applied sometimes to ill conditioned sores, and operates as an astringent.

Laudanum. In diarrhœa and dysentery, it allays pain, and diminishes the increased action of the bowels, and is very serviceable either alone or joined with other substances.

Mercury. The various preparations of mercury are very powerful, and eminently useful in curing cutaneous disorders, as well as several disorders of the constitution. The common ointment is not so cheap nor so powerful as that made of the preparation called corrosive sublimate, as an external application. But when it is desired to introduce mercury into the system, friction with common ointment is the safest and surest method.

Nitre, or *Saltpetre*, when taken in large doses proves fatal. In small doses it diminishes the heat of the body, and operates both by stool and urine.

Rhubarb, besides its purgative qualities, possesses considerable astringent powers, which render it very useful in diarrhœa.

Salt, Common. Sea salt operates as a purgative, and it is very useful in clysters.

Salt, Glauber's, is a cheap, mild, and effectual purgative, and perhaps the most useful that can be employed.

Sulphur, operates as a purgative, and promotes insensible perspiration. It is very efficacious in disorders of the skin. It is very penetrating as appears from its making its way through every pore of persons who take it.

Terra Japonica, Japan earth, or *Catechu.* This is one of the *best* astringents in the whole Materia Medica, and is exceedingly useful in looseness of the bowels.

EXPLANATION OF THE PLATES

PLATE I.

This plate represents the *four* stomachs, and the intestinal canal of a sheep, taken out of the body and placed nearly in their relative situations. *a*, is the gullet, or œsophagus, leading into *b*, the paunch, or first stomach. *c c* is the second stomach, or honeycomb. *d* is the third stomach, or manyplies; and *e* is the fourth stomach, or red. *f f f* is that part of the alimentary canal called the small intestines, or guts, terminating in *g*, which is the large gut. *h* is the termination of the large gut, or what is called the rectum.

PLATE II.

Fig. 1st, represents the four stomachs laid open, so as to exhibit their internal structure. *a* is the gullet terminating by a large common opening in *b*, the paunch; and *c* the honeycomb. *d* is the manyplies; *e* is the red, and *f* is the intestine leading from it. The variety of the structure of the different stomachs is accurately represented in this figure.

Fig. 2d, shows the right side of the heart laid open, and its general shape. The arrows* are placed so as to represent the course of the blood through the large vessels. *a a* are the two large venous trunks which conduct the blood into *b*, the right auricle of the heart. *c* is the valve which is placed between the right auricle and right ventricle, preventing the blood from flowing back into the auricle

* By mistake the arrows have been omitted, but from the rest of the description they may easily be inserted.

when the ventricle contracts. *d* is the pulmonary artery which issues from the ventricle, and conveys the blood to the lungs. *e* is the aorta, or great artery into which the left ventricle empties itself, and by which the blood is circulated over the whole body. *f* is the edge of the left auricle, and *g* that of the left ventricle.

The six remaining figures of this plate show the changes which take place in the teeth of sheep during the first eight years; and by which their ages may be known.

Fig. 3d, represents the 8 teeth of the forepart of the under-jaw in a sheep, one year old.

Fig. 4th, the teeth of a sheep 2 years old.

Fig. 5th, - - - - - - - 3 years old.

Fig. 6th, - - - - - - - 4 years old.

Fig. 7th, - - - - - - - 5 years old.

Fig. 8th, shows the front teeth worn and broken, as is generally the case in the 7th or 8th year.

PLATE III

Shows the situation of the veins in the cheek and leg, most proper for bleeding.

Fig. 1st. In this figure the vein *a* is seen coming from below the under-jaw at *b*, and spreading its branches on the soft part of the cheek. A small nerve, *c*, runs in an opposite direction, and crosses over the vein; and, in the operation of bleeding, this nerve *should not be divided.* Below the nerve, a thick fleshy muscle is exposed, called the zigomaticus major, which has the principal share in moving the jaw during mastication. there is another muscle, *d*, much thinner than the former, beneath which the branches of the vein of the cheek pass; it goes to the corner of the mouth, and assists in the motion of the lips. The vein should be opened in the operation for bleeding, at the part where it is longest

and nearest the surface, and where there is least risk of injuring any adjacent part. The place marked *a*, will be found in general to answer best.

Fig. 2d. The vein *a* will be found running along the fore leg, taking an oblique or serpentine direction from the anterior part of the chest towards the bend of the knee. It may be opened at any place where it can be distinctly felt under the skin, and where it can be kept from slipping under the point of the knife. At *a*, it is generally readily found, and the trunk is of a sufficient size.

The other figure is described in a note, p. 35.

PLATE IV.

Fig. 1st, represents a vertical section of the head, intended chiefly to show the relative situation of the brain within the skull, and the facility with which an instrument, introduced through the nose, may perforate the skull and discharge water collected within the brain, in the disease called *sturdy*.

1, is the horn seen in outline, 2, 2, 2, 2, the skull or brain-case. 3, the nostril. 4, the edge of one of the cutting teeth, and lips. 5, the tongue divided. 6, the arch of the mouth, or palate. 7, 7, 7, the bones, called the *spongy* bones, which form the nose, and are the seat of the *organ* of *smell*. They are covered by a fine membrane, in which the nerves are distributed. The nerves form a very large surface in all those animals which possess the sense of smell in an eminent degree. In sheep this surface is very extensive, and their sense of smell is proportionably acute.

a, *a*, *a*, *a*, is the outer, cortical, or cineritious part of the brain; and *b*, *b*, *b*, *b*, the medullary portion, about the central part of which is seen partly laid open one of the ventricles of the brain, *c*, in which the water in one species of sturdy is collected. the dotted line *d e*, shows how easily an instrument

may be introduced for discharging water from the brain; and how thin the skull is between some part of the nose and brain, as at *e*.

Fig. 2d, represents an instrument called a trocar, for discharging the water in sturdy. It consists of a silver tube, or canula, 13 inches long, into which is fitted accurately, a sharp pointed wire or stilet. There is another blunt pointed wire, which is put into the canula when it is to be introduced in order to prevent it from injuring the *spongy* bones. The instrument may be introduced into the nostril in a direction nearly parallel to the skull; and when it comes to the bone the blunt pointed wire is to be withdrawn and the sharp one put in, when it is to be thrust forwards along within the canula, giving it a rotatory motion till through the skull, and then steadily but gently pushed forward, till the point is felt touching the opposite side of the skull. The stilet is now to be withdrawn, and if it has pierced the sac containing the water, the latter will flow through the canula. But it may happen that the orifice of the canula may have passed through the sac, and that the water will not flow on first withdrawing the wire. In this event, the canula must be slowly drawn outwards, and if it has passed the sac, the water will flow as soon as the orifice comes into it.

This operation frequently proves fatal. But although the animal subjected to it should at the time appear sick and even dead, it should not be disregarded; for there have been instances of a sheep recovering, after having lain as if dead for some hours. Bleeding after the operation may be of much service; and care should be taken not to disturb the animal in any way, while recovering.

PLATE V

Is explained pp. 75, 76, 85.

Sketch of the Stomach and Intestines.

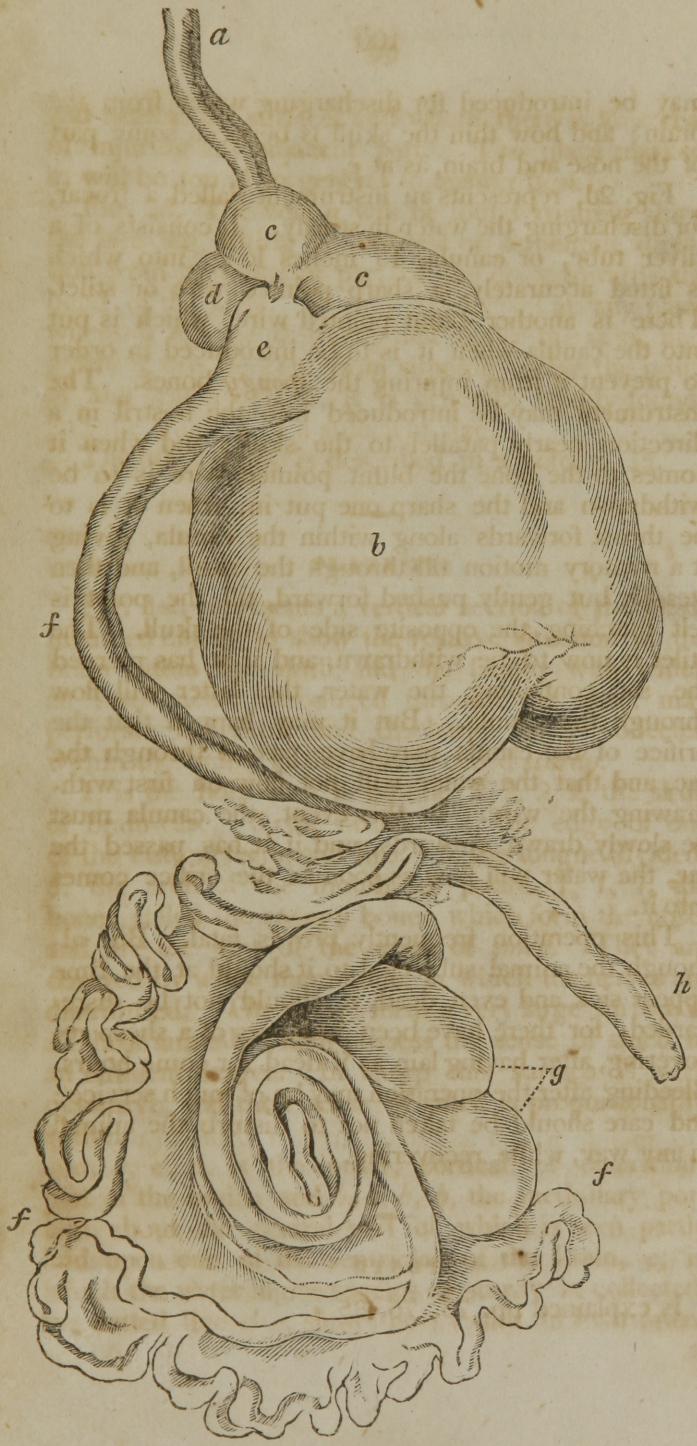


Fig. 1. The 4 Stomachs laid open.

The right side of the heart laid open *Fig.* 2.

Fig. 3

4

5

6

7

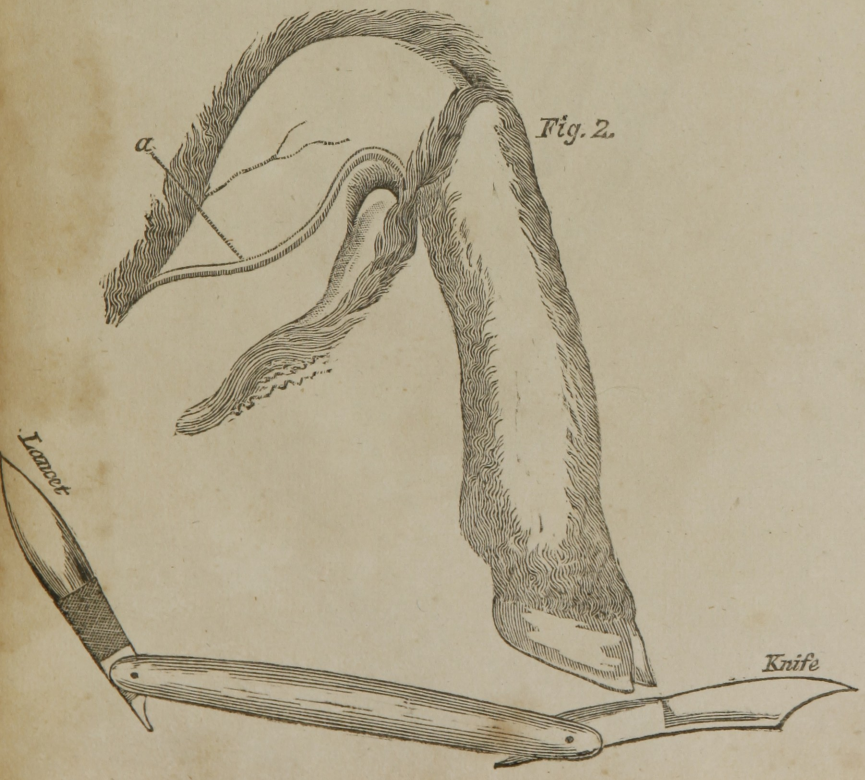
8

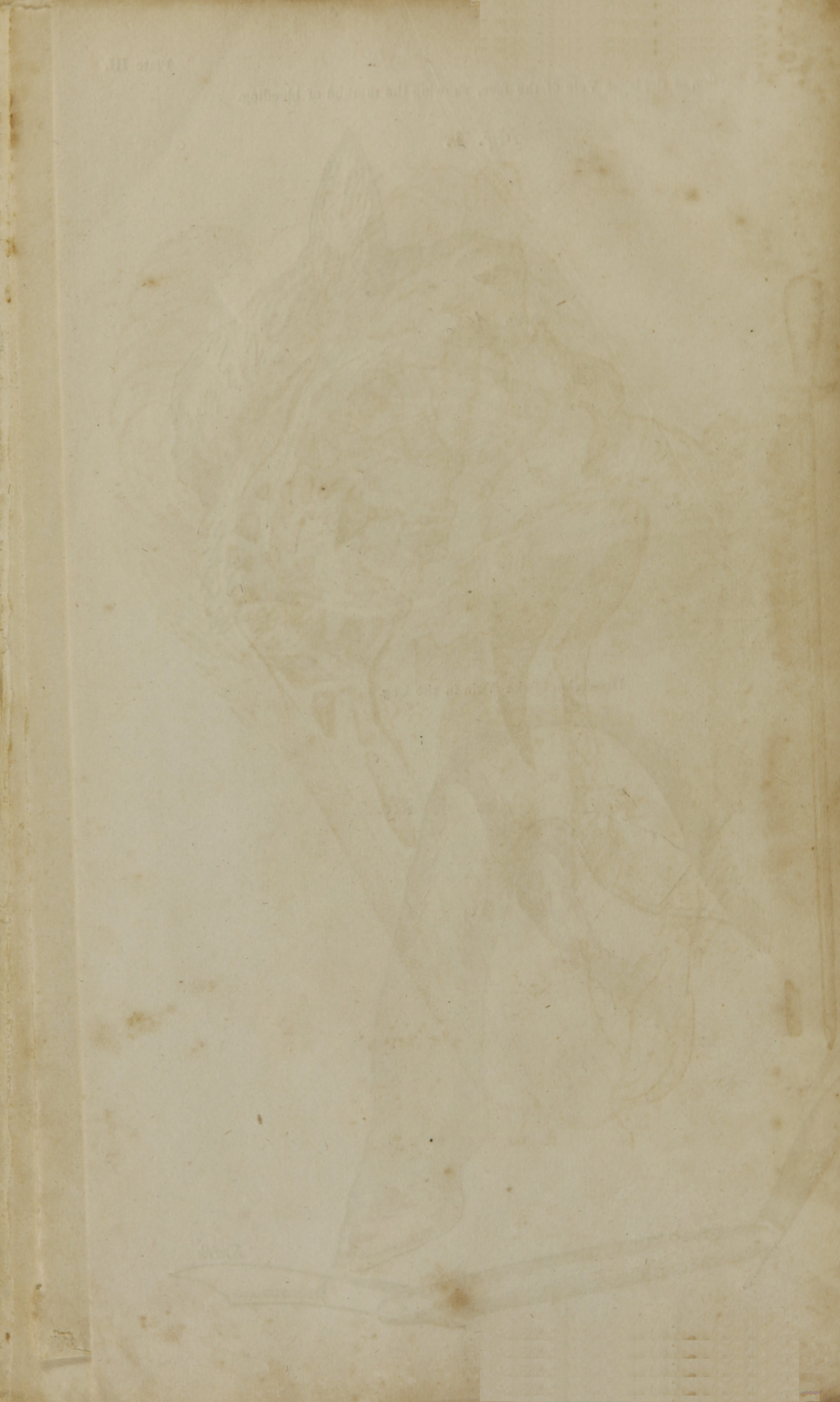
Dissection of the large Vein of the face, showing the method of bleeding.

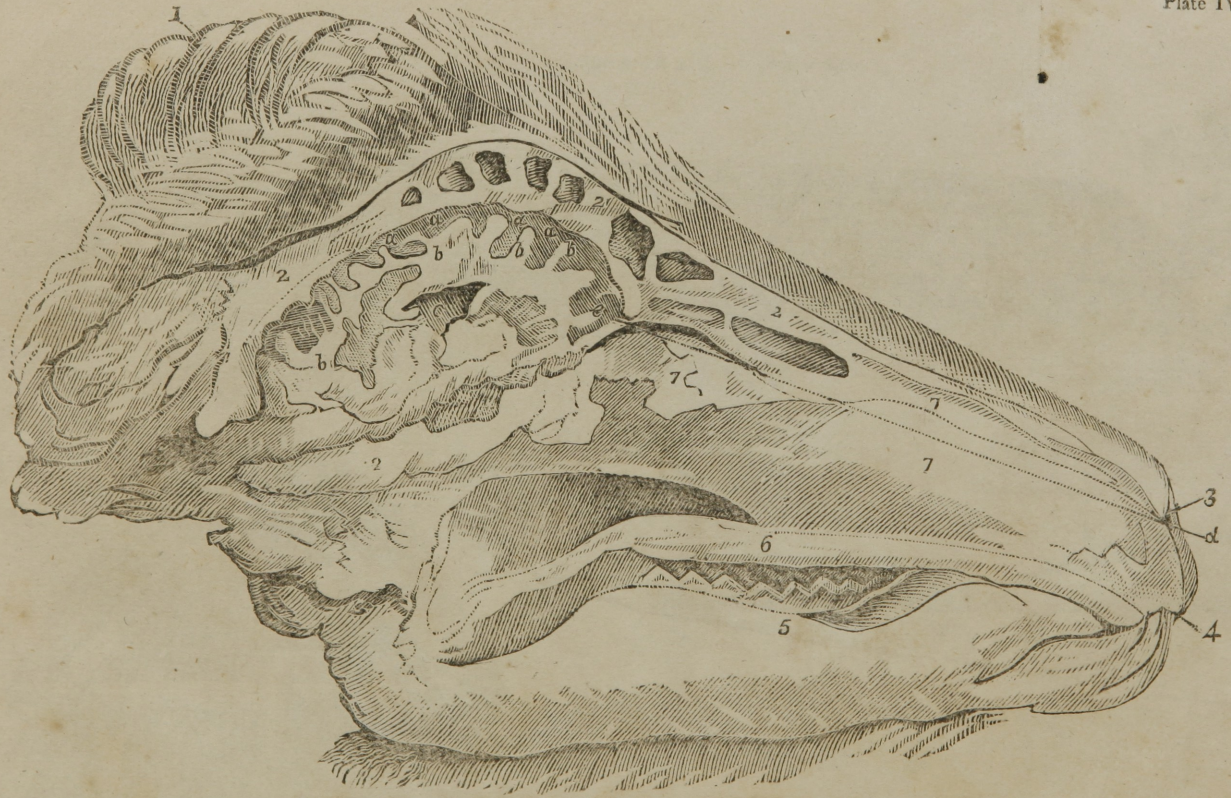
Fig. 1.

Dissection of the Vein in the Leg.

Fig. 2.



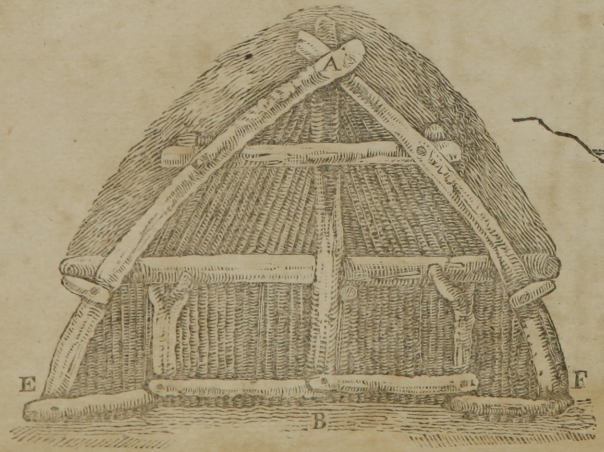




13 Inches long.

Sketch of the Sheep Cot lately erected at Coul.

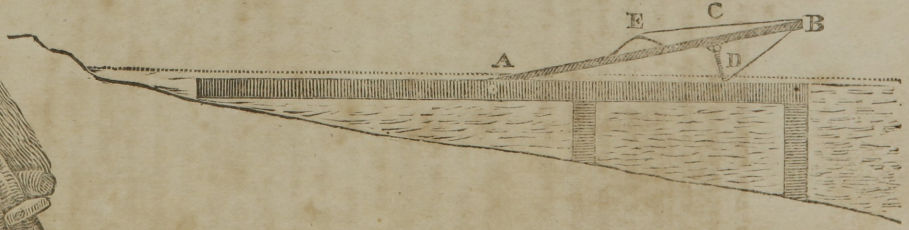
Fig. 2.



Inside of one end of the Cot.

Fig. 1.

Washing Stage.



APPENDIX.

A Project for extending the breed of fine-wooled Spanish Sheep, now in possession of his Majesty, into all parts of Great Britain, where the growth of fine clothing wools is found to be profitable.

AFTER experiments had been tried for several years, by the King's commands, with Spanish Sheep of the true Merino breed, imported from various parts of Spain, all of which concurred in proving that the valuable wool of those animals did not degenerate in any degree in this climate, and that the cross of a Merino ram uniformly increased the quantity, and meliorated the quality of the wool of every kind of short wooled sheep on which it was tried, and more particularly so in the case of the Southdown, Hereford, and Devonshire breeds, —His Majesty was pleased to command that some Merino sheep should be procured from a flock; the character of which, for a fine pile of wool, was well established.

Application was accordingly made to Lord Auckland, who had lately returned from an embassy to Spain; and, in consequence of his Lordship's letters, the Marchioness del Campo di Alange was induced to present to his Majesty five rams and thirty-five ewes from her own flock, known by the name of Negretti, the reputation of which, for purity of blood and fineness of wool, is as high as any in Spain.

For this present his Majesty was pleased to give the Marchioness, in return, eight fine English coach horses.

These sheep, which were imported in the year 1792, have formed the basis of a flock now kept in the park of his Royal Highness the Duke of York, at Oatlands, the breed of which has been preserved with the utmost care and attention.

The wool of this flock, as well as that of the sheep procured before from Spain, was acknowledged by the manufacturers who saw it, to

be, to all appearance, of the very first quality; yet none of them chose to offer a price for it at all equal to what they themselves gave for good Spanish wool, lest, as they said, it should not prove in manufacture so valuable as its appearance promised. It became necessary, therefore, that it should be manufactured at the King's expense, in order that absolute proof might be given of its actual fitness for the fabric of superfine broad cloth; and this was done year after year in various manners, the cloth always proving excellent: yet the persons to whom the wool was offered for sale still continued to undervalue it, being prepossessed with an opinion, that though it might not at first degenerate, it certainly sooner or later would alter its quality much for the worse.

In 1796 it was resolved to sell the wool at the price that should be offered for it, in order that the manufacturers themselves might make trial of its quality, although a price equal to the real value should not be obtained: accordingly the clip of that year was sold for 2s. per pound, and the clip of the year 1797 for 2s. 6d.

The value of the wool being now in some degree known, the clip of 1798 was washed in the Spanish manner, and it sold as follows:

The number of fleeces of ewes and wethers was 89;

Which produced in wool, washed on the sheeps' backs,	295 lbs.	
Loss in scouring,	92	
Amount of scoured wool,	203	
Which produced, Raffinos,	167 lbs.	at 5s. per lb.
Finos,	23	at 3s. 6d.
Terceros,	13	at 2s. 6d.

47*l.* 8s. 0d.

The clip of 1799 was managed in the same manner and produced as follows:

The number of fleeces of ewes and wethers was 101;

Which produced in wool washed on the sheeps' back	346 lbs.	
Loss in scouring,	92	
Amount of scoured wool,	254	
Which produced, Raffinos,	207 lbs.	at 5s. 6d. per lb.
Finos,	28	at 3s. 6d. per lb.
Terceros	19	at 2s.

63*l.* 14s. 6d.

The rams' wool of the two years sorted, together produced as follows:

Quantity of wool washed on the sheeps' back,		-	314 lbs.
Loss in scouring,		-	99
Amount of scoured wool,		-	215
Which produced, Raffinos	181 lbs.	at 4s. 6d.	per lb.
Finos	22	at 3s. 6d.	
Terceros	12	at 2s. 0d.	

45*l.* 15s. 6d.

It is necessary to account for these extraordinary prices by stating that in the year 1799, when both sales were effected, Spanish wool, was dearer than it ever before was known to be; but it is also proper to add, that 5s. 6d. was then the price of the best Spanish piles; and that none were sold higher, except, as it is said, a very small quantity for 5s. 9d.

The king has been pleased to give away to different persons, who undertook to try experiments by crossing other breeds of sheep with the Spanish, more than one hundred rams and some ewes. In order, however, to make the benefit of this valuable improvement in the staple commodity of Great Britain accessible to all persons who may chuse to take the advantage of it, his Majesty is this year pleased to permit some rams and ewes to be sold, and also command that reasonable prices shall be put upon them, according to the comparative value of each individual; in obedience to which it has been suggested that five guineas may be considered as the medium price of a ram, and two guineas that of a ewe; a sum which it is believed the purchaser will, in all cases, be able to receive back with large profit, by the improvement his flock will derive from the valuable addition it will obtain.

Though the mutton of the Spanish sheep was always excellent, their carcases were extremely different in shape from that mould which the fashion of the present day teaches us to prefer; great improvement has, however, been already made in this article, by a careful and attentive selection of such rams and ewes as appeared most likely to produce a comely progeny; and no doubt can be entertained that, in due time, with judicious management, carcases covered with superfine Spanish wool may be brought into any shape, whatever it may be, to which the interest of the butcher, or the caprice of the breeder may chuse to affix a particular value.

Sir Joseph Banks, who has the honour of being intrusted with the management of this business, will answer all letters on the subject of it, addressed to him in Soho-square. The rams will be delivered at Windsor; the ewes at Weybridge in Surrey, near Oatlands.

As those who have the care of his Majesty's Spanish flock may naturally be supposed partial to the project of introducing fine wool in these kingdoms, it has been thought proper to annex the following notice, in order to show the opinion held of a similar undertaking in a neighbouring country, where individuals, however they may have mistaken their political interest, are rather remarkable for pursuing and thoroughly weighing their own personal advantage in all their private undertakings, and for sagacity in seizing all opportunities of improving, by public establishments, the resources of their nation.

FRENCH ADVERTISEMENT.

"On the 24th May last, an advertisement appeared in the Moniteur, giving notice of a sale of two hundred and twenty ewes and rams of the finest wooled Spanish breed, part of the flock kept on the national farm of Rambouillet: also two thousand pounds of superfine wool, being the present year's clip of this national flock; and one thousand three hundred pounds of wool, the produce of the mixed breeds of sheep kept at the menagerie at Versailles." This advertisement, which is official, is accompanied by a notice from Lucien Bonaparte, Minister of the Interior, as follows:

"The Spanish breed of sheep that produce the finest wool, introduced into France thirty years ago, has not manifested the smallest symptom of degeneration: samples of the wool of this valuable flock, which was brought from Spain in the year 1786, are still preserved, and bear testimony that it has not in the least declined from its original excellence, although the district where these sheep have been kept is not of the best quality for sheep farming; the draughts from this flock, that have been annually sold by auction, have always exceeded in value the expectation of the purchasers, in every country to which they have been carried, that is not too damp for sheep.

"The weight of their fleeces is from six* to twelve pounds each, and those of the rams are sometimes heavier.

"Sheep of the ordinary coarse woolled breeds, when crossed by a Spanish ram, produce fleeces double in weight, and far more valuable, than those of their dams; and if this cross is carefully continued, by supplying rams of the pure Spanish blood, the wool of the third or fourth generation is scarce distinguishable from the original Spanish wool.

"These mixed breeds are more easily maintained, and can be fattened at as small an expense as the ordinary breeds of the country.

"No speculation whatever offers advantages so certain, and so considerable, to those who embark in it, as that of the improvement of wool, by the introduction of rams and ewes of the true Spanish race, among the flocks of France, whether the sheep are purchased at Rambouillet, or elsewhere; in this business, however, it is of the greatest importance to secure the Spanish breed unmixed, and the utmost precaution on that head should be used, as the avarice of proprietors may tempt them to substitute the crossed breeds instead of the pure one, to the great disappointment of the purchaser.

"The amelioration of wool at Rambouillet, has made so great a progress, that in a circle from twenty-four to thirty-six miles in diameter, the manufacturers purchase thirty-five thousand pounds of wool, improved by two, three, or four crosses. Those who wish to accelerate the amelioration of their flocks by introducing into them ewes of this improved sort, may find abundance to be purchased in that neighbourhood at reasonable rates."

A REPORT

Of the state of his Majesty's flock of fine wooled Spanish sheep, during the years 1800 *and* 1801; *with some account of the progress that has been made towards the introduction of that valuable breed into those parts of the United Kingdom where fine clothing wools are grown with advantage.*

On the 9th of June, 1800, when His Majesty's Spanish flock was

* *This must mean fleeces unwashed, or in the yolk, as it is technically termed.*

shorn, it consisted of 100 ewes and wethers, which produced as follows :

Wool washed on the sheeps' back,	. .	398 lbs.
Loss in scouring	. . . . .	104
Amount of scoured wool,	. . . . .	294
Which produced when sorted,	Prime, 234 lbs.	at 5s. per lb.
	Choice, 34	at 3s.
	Fribbs, 26	at 1s. 6d.

65l. 11s. 0d.

Eight rams and nine ewes were this year disposed of, which were all that could be spared from the flock. Two of the rams went into Dorsetshire, where the breed is much approved by some skilful judges of sheep, and seems likely to produce considerable advantage by crossing with the common sheep of the country.

Mr. Bridge of Windford Eagle, communicated this year the result of an experiment he had made on three kinds of sheep, viz. Dorset, half Spanish and half Dorset, and half Spanish and half Mendip.

He kept these sheep from the year 1798, when they were lambed, till February 1800, when they were butchered as fat sheep ; and having valued them in June 1798, he found the carcases of each sort, with two years' wool which had been shorn from them, to yield at that time the following increase in value :

Real Dorset, ...	4l. 5s. 6d.
Half Spanish half Dorset, .	4l. 3s. 8d.
Half Spanish half Mendip, .	3l. 19s. 2d.

In these experiments Mr. Bridge's wool stapler values the Dorset wool at 1s. 2 1-2d. a pound, and the half Spanish wool at 1s. 4 1-2d. only ; but as the Spanish cross in both cases increased the quantity of wool, and as half Spanish wool has never, when its value was properly known, been sold for less than 1s. 9d. and generally more than 2s. per pound, there can be no doubt that the improvement in value arising from the cross is in both cases considerable.

Mr. J. Ridgeway, of Upperton, in the parish of Yazer, in Herefordshire, communicated an experiment, in which two sheep, the one a Ryeland, and the other half Spanish and half Ryeland, of equal weights, were fed by him together : the half Spanish sheep produced in a year 2 lbs. 12 oz. more wool, and 5 lbs. more mutton than the Ryelander. This gentleman, whom his Majesty graciously permit-

ted to have rams from the Spanish flock some years ago, has also shown by his accounts that the wool of his flock of about 16 score of sheep, has been so much increased both in quantity and in value by the Spanish cross, as to have produced nearly twice as much money for each clip after the Spanish blood was established in it, as it usually did before.

In June 1801, the Spanish flock consisted of 108 ewes, and wethers,

Which produced in wool washed on the sheeps' back, 397 lbs.
Loss in scouring, - - - - - - 112
Amount in scoured wool, - - - - - 285
Which produced when sorted,

Prime,	237 lbs.	at 5s. 6d.	per lb.
Choice,	31	at 3s. 6d.	
Fribbs,	17	at 1s. 9d.	

72l. 1s. 9d.

The wool of the rams and fatting wethers, which had been kept separate, was prepared for sale at the same time, and produced in

Wool on the sheeps' back, - 220 lbs.
Loss in scouring, - - 82
Amount of scoured wool, - 138
Which produced when sorted,

Prime,	96 lbs.	at 5s.	per lb.
Choice,	30	at 3s. 6d.	
Fribbs,	12	at 1s. 9d.	

30l. 6s. 0d.

This year eight rams and twenty-two ewes were sold. If the foot rot had not unfortunately damaged the rams very materially, more of them would have been disposed of. It is, however, observable, that although the rams that are kept at Windsor, in rich land, are occasionly attacked by this harrassing disease, the ewes and wethers which feed on dry and hilly pastures of Oatlands, have never been subject to lameness of any kind.

Eleven wethers that had been sent to the marshes in order to try the effect of rich pasture in fattening sheep of this breed, were slaughtered this year by Mr. King, of Newgate market, previous to the Smithfield meeting, which usually takes place the week before

Christmas. Two of the carcases were given to persons who had been useful in ascertaining the value of the Spanish breed; the remaining nine were sold to Mr. Giblet, butcher, in Bond-street, whose judgment in selecting, and liberality in purchasing, the best carcases is well known both to those of whom he buys, and to those who buy of him. The sale bill is as follows:

1 sheep,	6 stone,	6 lbs.	at 6*s.* per stone,		2*l.*	0*s.*	6*d.*
1	7	0	6		2	2	0
1	6	1	6		1	16	0
1	7	2	6		2	3	6
1	5	6	6		1	14	6
1	5	2	6		1	11	6
1	5	7	6		1	15	3
1	5	4	6		1	13	0
1	6	2	6		1	17	6
11 heads and plucks, at			1		0	11	0
10 stone, 4 lbs. fat at 3*s* 10*d.*					2	0	3
				Total,	19*l.*	5*s.*	9*d.*

Respecting the goodness of the mutton, inquiry must be made of Mr. Giblet, at whose shop the carcases were shown for several days, and of his customers who purchased the joints. Experience has, however, demonstrated already, both at Windsor and at Weybridge, that Spanish mutton is of the best quality for a gentleman's table.

The pelt wool of these eleven sheep was taken off, in order that its value might be ascertained.

It weighed in the yolk,	36 lbs.
Loss in scouring,	8
Amount of scoured wool,	28

It was sold as skin wool for 4*s.* 6*d.* a pound, and of course, produced 5*l.* 19*s.* or 10*s.* a sheep, all expences deducted. The amount of this profit was quite unexpected and holds forth a source of advantage in this breed, that has not probably hitherto been calculated upon.

Of all who have laboured to render his Majesty's patriotic views in importing Spanish sheep permanently useful to his subjects, Dr. Parry of Bath, deserves the highest commendation. Amidst the la-

bours of a profession always toilsome, when successful, and particularly so at Bath, where persons, whose diseases cannot be ascertained by the faculty elsewhere, continually resort, the Doctor found leisure to employ himself in the improvement of the British fleece, by crossing various breeds with Spanish rams, presented by his majesty to the Marquis of Bath, and to the Bath Agricultural Society.

The prizes the Doctor has continually obtained from the judicious and respectable body from whom he borrowed rams, for cloths made of his own wool, in the midst of a manufacturing country, and amongst abundance of able competitors, proves to a demonstration, that he has brought the fleeces of the mixed breed very nearly to the value of the original Spanish; nor is this to be wondered at, when we recollect that the effect of a mixture of breeds operates in the following proportions:

The first cross of a new breed gives to the lamb half of the ram's blood, or	50 per cent.
The second gives - - - - - - - -	75
The third - - - - - - - - -	87 1-2
The fourth - - - - - - - - -	93 3-4

At which period it is said, that if the ewes have been judiciously selected, the difference of wool between the original stock and the mixed breed is scarcely to be discerned by the most able practitioners.

More need not be said of the Doctor's merit; his book, which every man who wishes to improve wool ought to read, will give a more just idea of the acuteness of his discrimination, the diligence with which he pursued his purpose, and the success that finally attended his judicious management, than can be stated in the brief form of a report like this.

Much, however, as Dr. Barry deserves the gratitude of all who honour the fleece, Lord Somerville's merit stands at least as eminently conspicuous. Emulating the example of his sovereign, his Lordship, whose just discrimination of the value of different breeds of stock, is admitted by the most experienced agriculturalists, made a voyage to Portugal for the sole purpose of selecting by his own judgment, from the best flocks in Spain, such sheep as joined in the greatest degree the merit of a good carcase to the superiority in wool which the Merino flocks are allowed to possess.

His Lordship succeeded, and brought home, more than two years ago, a flock of the first quality, which will probably repay with

advantage the costs of the undertaking, as some of his Lordship's rams are said to have been already sold for 100 guineas each.

As ten crops of wool have now been shorn from his Majesty's Spanish flock, and not a single sheep has been introduced into it during the whole of the two years that have produced them: and as the tenth crop afforded nearly five-sixths of prime wool, and only one fourteenth of fribbs, it is to be hoped that the deep-rooted prejudice which has for ages deceived the people of England into an opinion that Spanish wool degenerates in this climate, will now be finally lodged in that catalogue of vulgar errors which the increase of human knowledge daily enlarges. It is to be hoped also that a bold assertion hazarded here, that the mutton of Spanish fine wooled sheep is course, tough, and little better than carrion, will be contradicted by the evidence of Mr. Giblet, and his customers, to the satisfaction of those who have unwarily given credit to it.

His Majesty having been pleased to permit the sale of such sheep as can be spared from the Spanish flock to be continued, the rams will be delivered at Windsor, and the ewes at Oatlands, in the latter end of August. As, however, it has been suggested to his Majesty, that the carcases of the sheep are evidently improved, and that the wool has rather gained than lost in value, six guineas will in future be the price of a ram, and two that of a ewe. And as his Majesty has been graciously pleased to continue to entrust the management of the flock to Sir Joseph Banks, all letters on the subject of it, addressed to him in Soho Square, will be answered, and the utmost endeavours used to consult the convenience of those who wish to become purchasers.

JULY, 1802.

A REPORT

Of the state of his Majesty's flock of fine wooled Spanish Sheep, for the year ending Michaelmas, 1803—*by Sir* JOSEPH BANKS, *F. R. S.*

The wether lambs of the last year having been sold in their wool, and the rams' wool retained in order that two year's growth might be prepared for sale together, his Majesty's Spanish flock consisted when shorn, in June, 1802, of ninety-six ewes only; the fleeces of these, after having been washed on the sheep's backs as usual, weighed as follows:

In wool as shorn from the sheep, - - -				352 lbs.	
Loss in scouring, - - - - - - - -				96	
Amount of scoured wool, - - - -				256	
This wool, when sorted, produced as follows :					
Prime wool, or R.	221 lbs. at	5s. 9d.		63*l.*	10*s.* 9*d.*
Choice Locks, or E.	32	3s. 6d.		5	12 0
Fribbs, or T.	3	1s. 9d.		0	5 3
				69*l.*	8*s.* 0*d.*

After deducting the expense of sorting and scouring, at the high rate which an individual, who is not a manufacturer, must pay for these processes, this wool is worth about 5*l.* a tod, or 43*l.* 5*s.* a pack, as clipped from the sheep's back.

The prime wool was purchased by John Maitland, Esq. Member of Parliament for Chippenham, whose mercantile house, established for more than a century, has always dealt largely in the importation of Spanish wool, and who, from the first introduction of Merino sheep into this country by the King, in the year 1787, has uniformly given the most liberal and zealous aid to the promotion of his Majesty's patriotic views, though doubtful in the beginning of the ultimate success of the project.

It was made into cloth by Mr. Edridge, a manufacturer of Chippenham, whose skill and respectability in his line are exceeded by no man. He inspected its quality with the most minute exactness, and with an eye more inclined to expect symptoms of degeneration than of improvement, during the whole of the numerous processes to which wool is subjected in the making of broad cloth, and he found that in every one of them, it answered to his complete satisfaction. The cloth made from this wool proved so excellent in its kind, that the King was graciously pleased, at the desire of Mr. Maitland and Mr. Edridge, to permit these gentlemen to explain, in his Majesty's presence, its qualities and peculiarities. Samples of this cloth may now be seen in Mr. Maitland's warehouse, in Basinghall-street ; and it will be found, in conversing with Mr. Maitland and his partners, that in their opinion, the raffinos of his Majesty's wool, considered as a pile, are inferior to but few of the best of those imported from Spain, though it is probable that no pile in Spain throws out so small a proportion of finos and terceros. From this opinion it may fairly be deduced, that his Majesty's wool has improved since the sheep

were imported from Spain; indeed there is every reason to believe that it is still improving, and will in a very few years equal, if not excel, the very best piles that have hitherto been imported into this kingdom.

Mr. Tollet, a gentleman of Gloucestershire, who has purchased Merino sheep both from the King and from Lord Somerville, has been very successful in improving the carcase without damaging the wool; he posseses a ram, bred from a ram and an ewe both purchased from the royal flock in 1801, which, when clipped in June last, yielded 11 lbs. 12 oz. of unwashed wool. The carcase of this sheep was then estimated by good judges at 10 lbs. a quarter; and it was admitted to be a handsome sheep. For this animal Mr. Tollet has refused an offer of 200 guineas, or of 100 for the next year's use of him; he also refused 30 guineas each for the sire and the dam, though old and infirm, being unwilling to part with animals which had belonged to the royal flock; he however sold their ram lamb of the last year for 30 guineas, and thus made some progress in ascertaining the value of this important breed.

These facts, which prove an amelioration in the King's Merino sheep, are fully confirmed by the improved shape and weight of his Majesty's shearling rams of the present year, and give a justifiable hope, that by a due selection of rams and ewes, and a correct judgment in matching them, Merino sheep will in time be produced with carcases perfectly fashionable, and wool as perfectly fine.

No purchaser having been found last year for the lambs' wool at a price adequate to its value, it was made into light lady's cloth, which proves excellent, and promises to be a valuable article. A speculation, however, has offered for manufacturing the lambs' wool into superfine woollen hose, which seems likely to yield a still better price for the raw article than the cloth.

The demand for his Majesty's Merino sheep increases at present beyond all calculation. The best informed clothiers in Gloucestershire, enlightened no doubt by the useful labours of the Bath Society, and the valuable experiment of Dr. Parry, as well as by the Doctor's, and by Lord Somerville's publications, are amongst the most anxious applicants to purchase. The Bath Agricultural Society, whose attention has been most particularly directed to the improvement of British wool, humbly requested the King to give them a Spanish ram; which request his Majesty most graciously complied with last autumn and they returned thanks in the warmest terms of respectful gratitude and satisfaction.

As speculation in the value of Spanish sheep is evidently on the increase, and a reasonable probability now appears that his Majesty's patriotic exertions in introducing the breed, will at last be duly appreciated and properly understood, it would be palpably unjust should the views of those who wish to derive a fair advantage from the sale of the progeny of Spanish sheep purchased by them from the royal flock, be in future impeded by a continuation of the sale of the king's sheep at prices below their real value. This circumstance having been stated to the king, his Majesty was graciously pleased to permit the rams and ewes that are to be parted with from the royal Merino flock this year, to be sold by auction in the same manner as is done at Woburn, by his Grace the Duke of Bedford, and at Holkham, by Mr. Coke, on the presumption of this being the most likely manner of placing the best individuals of their improved breeds in the hands of persons most likely to preserve, and further to improve them.

JOSEPH BANKS.

17th August, 1803.

POSTSCRIPT.

As the publication of this report has been delayed by unavoidable circumstances to so late a period, it is proper to add, that the wools of 1803 have yielded, both raw and scoured, much as usual. The prime, or raffinos, of the ewe flock, were sold for 6s. 9d. a pound, and that of the rams for 6s. 6d. These enormous prices, however, depended on a scarcity of imported Spanish wool, and are highly distressing to the manufacturer; they ought not, therefore, to be allowed to enter into the speculation of the grower.

10th July, 1804.

I have not been able to procure any report which may have been made of the progress of his Majesty's flock, subsequent to the above period. I have reason to believe that they have been discontinued. The sales of drafted rams and ewes from this flock have been continued. The following is an account of the sale which took place in August, 1807.

RAMS.

Lot 1	A four-toothed ram,	14*l*	3*s*.	6*d*.	
2	do.	17	6	6	now in my possession.
3	do.	18	18	0	
4	do.	14	3	6	
5	do.	26	5	0	
6	do.	23	2	0	now in the possession of
7	do.	15	15	0	Mr. M'Leod, of Geanies,
8	do.	38	17	0	Ross-shire.
9	do.	26	5	0	
10	do.	29	8	0	
11	do.	18	18	0	
12	do.	26	5	0	
13	do.	26	5	0	
14	do.	23	2	0	
15	a six toothed ram,	43	1	0	
16	do.	34	13	0	now in my possession.

EWES.

Lot 17	a full mouthed ewe	11	11	0	
18	do.	15	4	6	
19	do.	12	1	6	
20	do.	17	17	0	
21	do.	21	10	6	
22	do.	22	1	0	now in my possession.
23	do.	26	5	0	do.
24	do.	27	6	0	
25	do.	28	7	0	
26	do.	24	3	0	
27	do.	19	10	0	
28	do.	27	6	0	
29	do.	31	10	0	now in the possession of
30	do.	27	6	0	Mr. M'Leod of Geanies.
31	do.	29	8	0	
32	do.	27	6	0	now in my possession.
33	A full mouthed ewe.	32	11	6	
34	A six-toothed ewe.	11	11	0	
35	do.	10	10	0	
36	do.	10	10	0	
37	do.	16	5	6	now in the possession of Mr. M'Leod of Geanies.

Lot. 38.	An old ewe, or with some defect, marked "an ewe" in the catalogue,	11*l.*	1*s.*	6*d.*
39	A six-toothed ewe,	13	2	6
40	do.	10	10	0
41	do.	17	17	0
42	do.	21	0	0

Of the above, eight came to Ross-shire.

One of the ewes which was in Mr. M'Leod's possession, died last spring (1809.)

LETTER

From Dr. Parry, who is mentioned in Sir Joseph Bank's Reports, to the Bath and West o England Society.

From Papers of the Bath Society, vol. X.

GENTLEMEN Circus, 10th Dec. 1804.

Having, during the last thirteen years, carefully attended to the cultivation of a breed of sheep, for the wool of which, in various forms, the Society has done me the honour to award me several premiums, I think myself called upon to communicate to them the general result of my experience. This I shall do in form of propositions, each of which I shall attempt to demonstrate by specimens now exhibited to the Society.

I must premise, that except a few Morfe ewes, which I employed at the commencement of my experiments, but which I soon thought I had good reasons for discarding, my ewes were wholly of the ryeland breed, selected for me in Herefordshire, and altogether uncontaminated by the admission of any of the larger and more fashionable kinds. The rams which I have employed for the original crosses have been Merinos, from the flocks of the King and Lord Somerville. Of these rams I have at different times used about ten.

1. The first proposition which I shall endeavour to establish, is,

that the wool of the fourth cross of this breed is fully equal in fineness to that of the male parent stock in England.

(Here follow references to specimens.)

I may add, that, except by accident, the wool of no clip short of the fourth, equals in fineness that of Spain.

2. 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 bred parents, and of course to those of the original progenitors of the pure Merino blood in England.

(Reference to specimens.)

In 1802, I ignorantly hoped to improve my wool by one dip more of the Spaniard. Accordingly one hundred of my best ewes were served by three pure Merinos. The consequence was, that the entire produce was considerably coarser than that of the former generation.

What comparison the produce of these mixed rams with unmixed English ewes, will bear with those descended from pure English ewes crossed with the pure Merino, I cannot from my own experience demonstrate. All, however, which I know tends to prove them in no respect inferior; and I have the evidence of a breeder of Southdown sheep in Surrey, whose letter to me I am ready to produce, if required, and who has this year employed these rams to upwards of six hundred ewes, to show that their lambs, both in wool and carcase, are superior to those from pure Merinos. I need not point out to the Society the important consequences which result from this fact.

3. 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.

The doctor produced a specimen of the N. E. or Nigretti pile, for which a manufacturer in a neighbouring county, deservedly of the highest reputation, lately gave, in the unscoured state, 6s. 9d. per lb. This specimen is peculiarly interesting, because it is from that Spanish flock which furnished the Merino sheep now in the possession of the King, and from which are descended most of our mixed races.

The finest specimen was "the Lastini pile;" for which, unscoured, the gentleman who favoured me with this specimen, gave, nearly a year ago, 6s. 9d. per lb.; of course, when scoured, it was then worth 7s. 9 1-2d. per lb. and I believe it could not now be obtained without a considerable advance of price. *This is the finest specimen*

of Spanish wool which I have been able to procure during the last twelve years; but I do not think it equal to that of my rams' fleeces, Nos. 6. and 7.

In comparing many of my fleeces with the imported Spanish wool of these most vaunted piles, there is one difference which will surely strike the most unskilful observer—that while the latter is dry, and harsh, and untractable, mine is to the touch, soft, flexible, and silky.

4. 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.

Whatever merit there may be in these articles (the specimens) I will hereafter assign sufficient reasons, why they are by no means equal to what may be expected from my stock at a future period.

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

In what is called a pile of Spanish wool, the R. or raffino is as 20; the F. or fino, 4; and the T. or tercera, 1: that is, the F and T are equal to one-fourth of the R. or one-fifth of the whole; the F. one-fifth of the R. and the T. one-twentieth. In the blue cloth, No. 14, the R. was 44 lb. the F. 7 1-2 lb. and the T. 2 1-4 lb. According to the above proportion of the Spanish, the F. and T. of this wool should have been 11 lb.; whereas they were only 9 3-4 lb. This difference of 1 1-4 lb. is in the F. wool, which is so much less than in the pure Spanish. I beg the Committee to examine and express their opinion, whether this F. wool of my flock is not superior in quality to what is usually imported from Spain. I am told that my T. wool is entitled to the same comparative preference.

6 This wool is more profitable to the manufacturer than the best Spanish.

It requires 60 lb. of good Spanish wool, in the imported state, to make 30 yards of broad cloth, dyed in the wool of the proper substance. These 60 lbs. waste in scouring to 52 lbs. Hence it follows, that 52 lbs. of scoured Spanish wool are necessary to make 30 yards of good wool-dyed broad cloth. The R. wool of the British cloth, No. 14, having been 44 lbs. should therefore have made about 25 1-3 yards; whereas, in fact, it made 26 3-4 yards; and, it is asserted by the manufacturer, that if it had not deceived him as to its capacity of milling, to which is owing its uncommon strength, it would have reached in length one yard and a half more of cloth of the usual

substance. This account corresponds with that of Mr. Waletoon's prize cloth from my wool, in the year 1802. The raffino wool-dyed and picked blue was 47 lb. which might probably have been 48 lb when only scoured. Now, 48 lbs. of scoured Spanish wool should make about 27 3-4 yards of broad cloth; whereas the same quantity of my wool, in this instance, produced 30 1-2 yards of cloth; which the draper, even at that time, sold for 23s. a yard.

"From these, and many other similar facts which I could adduce, I think myself authorised to infer, that this wool wastes less in the manufacture, and is, therefore, weight for weight more valuable than imported Spanish wool. For this difference very satisfactory reasons might be given; but I shall not take up the Society's time with enumerating them. It is sufficient for me to state, and I think, to have proved the fact.

I have spoken above as to the superior softness and flexibility of this wool. It is probable, that several gentlemen are here present, who, in manufacturing it, have found even the coarser samples to make much finer cloth than their appearance in the wool promised. Further evidence as to this point will be adduced under the next proposition.

As to its capacity of felting, I need go no further for proof than to the blue cloth No. 14, in which, as hath been before observed under this head, it turned out greater than was justified by the common appearance of Spanish wool.

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

In order to demonstrate this, I beg leave to exhibit three pieces of lamb's wool broad cloth.

The superior firmness of the cloth No. 20, to that of No. 19, is a convincing proof of the truth of the second proposition. At the same time I beg leave to ask, whether any gentleman here present has ever seen any cloth from imported Spanish lambs' wool, equal to this in fineness and softness. Thus is established the truth not only of this 7th proposition, but also of the 6th. I do not, however, exhibit this cloth as the best which may be produced from the lambs of this cross.* The wool was not uniformly good. Hereafter I shall assign

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* *Lambs got by a Merino ryeland lamb.*

the reason of this inequality, which it cannot be doubted that I shall be able to correct, should it be thought necessary.

8. Should long wool of this degree of fineness be wanted for shawls, or any manufactures which cannot be perfected with our common course long wools, the rams' fleece of the cross breed, which is exhibited, will prove that this can be effected by allowing the fleece to remain on the animal unshorn for two years.†

I beg leave here to trouble the Society with a few remarks. I have said that the cloths from sheep's and lambs' wool now exhibited, good as they certainly are, are still not the best which are to be obtained from my flock. It will be reasonable to ask, why I do not exhibit the best? I answer, because I have not hitherto had a sufficient choice of fleeces. It has already been stated, that till the fourth cross, the produce of ryeland ewes cannot be made to equal the Merino in fineness. On this principle, any one, who will give himself the time to calculate, will find that, beginning with 1000 ewes of the English blood, he will be eight years unless his lambs take the ram before he has one hundred and twenty-five sheep of that fourth cross. What then must have been the case with me, who or some years could not procure Spaniards to serve annually more than from five to twelve ewes? In fact, exclusively of the best fleeces, always reserved for exhibition and comparison, I have not hitherto been able to appropriate to the manufacture of fine cloth more, in any one year, than about thirty-five fleeces; and of these several have been only of the second rate. Of this class I consider the fleeces employed for the cloths, and more especially the cassimere, now exhibited. Having now much better rams, a further advance of time, and more experience, I may reasonably hope to remedy this deficiency. It will not, however, be till the year 1808, which is seventeen years from the

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† *Messrs. Tessier and Huzard gave an account to the French National Institute, of the sale of the wool and sheep of the flock of Rambouillet, in the year* 9, (1801) *as well as of the progress of the amelioration of wool in France during that period. The most interesting experiment mentioned by them was that of leaving the wool on some sheep for two years: by these means it acquired double length, gave a double weight, without any inconvenience to the animals, and was rendered exceedingly proper for the manufacture of woollen stuffs, so that it was employed in making kerseymeres, which were presented, and which are equal to the best English stuffs of that kind.*—Ph. Mag.

commencement of my experiments, that I shall expect to have a flock of four or five hundred sheep, all equal in fineness of fleece to Nos. 6 and 7. Before I conclude, I wish to call the attention of the Society to one more important point; which is my

11th and last proposition; that 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 carcase, comparatively with the Merinos originally imported.

For this purpose, I exhibit three two-toothed rams, eight ewes, two and four-toothed, and four chilver lambs. These sheep have not been fed for exhibition. All have eaten only grass. They have been constantly together in great numbers; and notwithstanding any want of merit as to high condition, an inconvenience very easily remedied by those who attach importance to it, they will be found superior in carcase to most pure Merinos which I have seen. I think they show that by a proper selection, this breed may soon become equal in carcase to the best southdowns. From the size of the two-toothed rams, no one will hesitate to conclude that wethers of this breed, at two shear, may easily be made to reach 16 or 18 lb. per quarter.

I beg the Society's pardon for having so long intruded myself on their attention. I shall probably give them little trouble of this kind in future; but as the subject at this time especially, is of great importance to the commercial interests of the country, I request that they would permit the committee to examine the several propositions which I have stated, and report on them, separately, at the general meeting to-morrow.

C. H. PARRY.

Extract of a Letter from Dr. Parry, to Sir George M'Kenzie, Bart.

The accounts which you give me of the hardiness of the royal Merinos is extremely gratifying to me, as it confirms my own experience, and answers the only solid objection which could lie against the introduction of that breed into our shamefully neglected wastes. I trust that the breeders of sheep in Great-Britain will now speedily see their own true interest and that of their country.

If you breed from the ryeland ewe, you will be astonished ultimately to see the superiority of the progeny, both as to carcase and fleece to the pure Merino race. I enclose a small specimen of the wool of one of my rams, the grandson of a Spaniard by the male,

and not nearer than the great grandson by the female; and I have much pleasure in adding, that the very finest piece of cassimere ever seen by our manufacturers, was this year (1807) made from my shearling rams of the same cross, unshorn when lambs.

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Dr. Parry's two works, the one published in the year 1800, and the other in 1807, contain the fullest information respecting his important experiments, and are strongly recommended to the perusal of all those who wish to be particularly informed of the progress of the improvement of British wool.

Copy of a Letter from Sir James Montgomery, Bart. M. P. to Sir George M'Kenzie, Bart.

Penicuik, 27th January, 1808.

Sir—I was prevented answering your first letter till now, owing to my not having been till lately in that part of the country where my Spanish sheep are, and where my papers relating to them are kept. The breed I have are a part, or rather the descendants of the Merinos that belonged to the Edinburgh wool society. Upon the dissolution of the society, about twelve or fifteen years ago, my father got that part of their flock. From a letter of the late Lord Daer, inserted in the Farmer's Magazine, for August, 1805, I observe that Sir John Sinclair procured that breed for the society from M. Daubmenton, in France, and the descendants in my possession answer exactly to the description given in his Lordship's letter, of that gentleman's breed. Ever since these sheep came into our possession, they have been pastered upon some fields at Stobo, of middling quality, but dry and well sheltered, and about from 600 to 700 feet above the level of the sea. They have been managed in the same manner as the other sheep of the country, and had nothing given them in winter, except when the depth of snow rendered it impossible for them to support themselves on the pasture, when they got a little hay or a few turnips. I think them as healthy a breed as any I know. They are indeed frequently lame, and I know many gentlemen think the Merino breed peculiarly subject to the foot rot. But I am not satisfied they are so. The lameness seemed to be occasioned by the outside horn of the hoof growing too fast, and by doubling under the sole, injured it, and dirt getting into the sore festered it. I speak incorrectly, per-

haps, when I say, the horn of the hoof grows too fast. I believe the growth is not materially great but owing to the sheep being confined in a field, small compared to the extent they delight to range in, did not get sufficient exercise to wear it down. They are a very active kind of sheep, and well adapted in their form for travel. My opinion is formed partly from noticing the state of their feet at different times, and partly from observing that in frost, when the ground is very hard, they are never lame, and if previously lame soon get well. For two years I weaned the Spanish lambs along with the lambs of my hill farm, on a large rough heathy hill, and none of the lambs were lame, although they were sometimes lame in their usual pasture. I likewise kept a few of them on the hill farm for several years, when they never showed any symptoms of lameness. This last experiment gave me a high opinion of the hardiness of the Spanish sheep, especially after they were a year old. The farm upon which it was made, consists of a valley and range of hills covered with heath and grass, the lowest part of which is about 700 feet, and the highest about 1800 feet above the level of the sea, and without any other shelter than the hills afford. In autumn, 1804, I sent seveveral Spaniards to that farm, the precise number I do not recollect. It proved unfortunately, a very unfavourable season for young sheep, my loss in hogs upon that farm, which is stocked with the Cheviot breed was from 15 to 20 per cent. The loss among the Spaniards was still greater, only two survived the winter. The others either died or were withdrawn from the hills for fear of their dying. But these two remained on that farm for three years, and though they got nothing but what they could pick up on the hills during winter, they were at all times as healthy as any of the flock, and one of them in particular was esteemed by the shepherd, the most active, and the best *snow breaker* under his charge. They are always, however, much leaner than the rest of the flock. This remark may likewise be applied to those which pastured in the parks. They are certainly much inferior to the native breed in the quality of fattening. They are, however, in tolerable order in the month of September, and made excellent fine grained and well flavoured mutton. If they had been better cared for during winter, I have no doubt they would have been still better. The lambs are never fat enough for a gentleman's table. They resemble kid, more than lamb.

I sent the wool of 1801, to Mr. Laycock, wool stapler in Southwark, to be scoured, sorted and sold, for the purpose of ascertain-

ing whether the wool had degenerated in quality from their long residence in this country. The account he returned me is as follows :

Fleeces in the yolk, 17 weighed, - - -		51 1-2				
1 Hereford fleece, - - - - - - -		1 3-4				
		53 1-4				
Scoured clean, - - - - - - -		35 3-4				
Loss in scouring, - - - - - -		17 3-4				
Sold Raffinos at 5s. 0d. - -	32 lbs.	8*l*.	0	0		
Finos, 2s. 6d. - -	3 - -	0	0	6	1-2	
Terceros, 0s. 9d. - - -	3-4 - -	0	0	6	1-2	
		8*l*.	8	0	1-2	

These prices I understood to be as high as were given that year, for any Spanish wool, and the very small quantity of finos and terceros, shows that the wool had not in any degree degenerated in consequence of our cold climate.

The wool of 1802 and 1803 was sold to the manager of the cloth manufactory at Inverleither, at 3s. 6d. per English pound in the yolk. I observe in my books that the fleeces of 1803 had been accurately weighed, 35 fleeces weighed 114 lb. 14 oz. which, at 3s. 6d. per lb. gives 11s. 5 3-4d. each fleece, and makes the average weight 3 lb. 4 oz. I must observe, however, that several of the ewes were very old, and produced very little wool. I think 6 lb. a fair average weight of the rams' fleeces, and from 3 to 4 lb. for the ewes. I had the wool of 1804 made into cloth at Inverleither, but the dressing of the cloth was ill executed. It was, however, a soft pleasant cloth to wear, and wore well. In 1805 I got 4s. per lb. for the wool in the yolk, which has been the price I sold for in 1806 and 1807.

The crosses I have tried have been with Hereford and Southdown ewes. The former produces the finest wool; the latter the largest sheep, and greatest quantity of wool. I prefer the former ; and after two crosses it is difficult to distinguish the wool from the entire Spanish. The price at which the wool of the cross breed sold, was 6d. per lb. under the Spanish. The shape and carcase were much improved by these crosses ; the cross breed fatted better than the pure Spanish, though still inferior in that respect to our native breed.

Three years ago I gave Sir John Stuart, of Coltness, a Spanish ram, who put him to some of the common black faced ewes. I saw lately three of the produce at Coltness, which were well shaped, and the shepherd told me they were active and hardy. The wool of this cross was sold for two following years at 2s. 6d. per lb. of 22 oz. in the yolk. I have likewise crossed some Shetland ewes with the Spaniard, but I do not like the produce. They have little wool, which can neither be classed with long or short wool, and the animals like the mother are wild, and difficult to fatten.

I have parted with my Spanish flock lately to Mr. Malcolm Laing, who is to take them to Orkney. My doing so did not proceed from any idea of their being an unprofitable stock, but because I have a large flock of Cheviots on a hill farm, and I think it more advantageous for me to pasture my grass grounds with the drafts from my Cheviot flock, than by keeping any separate stock for them whatever. I have no doubt, that to a country such as Orkney, distant from markets for fat sheep, and where the inhabitants require but little, the introduction of the Spanish breed will be very advantageous, for they are sufficiently hardy for the climate, and their wool so thick and oily, that rain does not affect them. I have examined the skin of these sheep, after they had been exposed a whole day to the rain, and found their skins as dry as if they had been in a house; nothing but the outside of the fleece gets wet.

Whether in a country where there is a great demand for fat cattle, this breed can be reckoned more advantageous than any other, appears a doubtful question, in their present unimproved state. In time the Merinos will be improved both as to shape and quality of fattening, in the same way as all other breeds have been improved, viz. by a proper selection of those to breed from. In their present scarcity that cannot take place. People desirous of having that breed are glad to take any kind of them they can get, and breed from them when too old to rear a well shaped offspring. In their present state, at least in the case of those I have, I think it very doubtful whether the loss upon the carcase is not equal to the gain on the wool.

Believe me, your's sincerely,

JAMES MONTGOMERY.

LETTER

From General Robertson, of Lude,
To Sir George Mackenzie.

Alderney, 29th December, 1807.

DEAR SIR,

I have delayed for some time to answer your very acceptable enquiry concerning the progress of the Merino breed of sheep introducing on my estate, until I might become not only particularly informed of all the circumstances relating to them since I last left home, but also to be able to give you (in so laudable an undertaking as that of endeavouring to remove the prejudices against so valuable a breed) every sort of information I have been able to procure from different parts of England, where their advantages have already been proved beyond every other species of sheep.

This subject being so nearly connected with incalculable advantages to the Highlands of Scotland, I shall first observe on the subject of prejudice against the Merino breed, that although it is many years since they were first introduced into some of the lower parts of Scotland, it happened unfortunately that they were placed on such unwholesome pastures in some instances, and so improperly cared for in others, that it became universally believed that this breed was so peculiarly liable to foot rot and other diseases, as to render it altogether unfit for Scotland. From some unsuccessful trials in Perth-shire, I was, among many others, misled into the same opinions, and thought it was a breed so extremely delicate, degenerating besides in carcase and wool in our climate, as to be undeserving of any attention except from theorists and agricultural speculators, who might choose to write or speak on such subjects. How much I have had just cause for a complete change of sentiment in those respects will now appear.

In the year 1804 I became a practical farmer, and possessed of a large flock of the Linton or black-faced, about 3,000 in number. I was soon struck with the great difference in price which was given by Mr. Baird, the wool-dealer, for what was produced from some of the white-faced stocks in your county (less numerous) and my own stock. While he assured me my pastures were as capable of rearing

the Cheviot or best woolled breeds, as any other grounds where they actually succeeded in the Highlands. I then resolved on a gradual but total change from the black-faced breed, by means of crossing it with Cheviot rams, and breeding also from Cheviot ewes on the same pasture, in order to make a comparative trial of their hardiness. At this time, however, I was called to England on my professional duties; and happening to be in London when his Majesty's first sale of Merinos took place at Kew, I was prevailed upon by a military friend who had been in Spain to attend the sale, and promise him to purchase a ram and ewe for trial, at all events, which I did; and having sent them by sea to Scotland, with some of the Southdown breed, I found next year, (1805,) that although no particular care had been taken of the Merinos, their fleeces averaged 1 1-2 lbs. beyond the weight stated by Sir Joseph Banks at the sale, that they had formerly yielded; and that year I also received 3s. more per lb. for their wool than what the Southdowns produced. These favourable circumstances determined me at once to give them a more extensive trial; and at the next year's sale, one of the best and highest priced shear rams was purchased on my account at Kew. He, likewise with 7 Southdown rams of the Duke of Bedford's breed, arrived at Lude in safety in September, 1805. My distribution that year was, first, to put the Merino rams to the Spanish, Southdown and Cheviot ewes, about 80; and, secondly, the Southdown and best Cheviot rams I could procure, to the Linton ewes, about 800 in number. The Leicester or Bakewell breed, about 30, were by themselves. Although the second part of this plan was far from meeting with approbation from the sticklers for the Linton breed, who pronounced confidently that their cross must prove soft and degenerate, it will be found in the sequel of this letter to have exceeded my most sanguine expectations of success.

Notwithstanding the uncommon severity of the spring of 1806, by which great numbers of the lambs perished at dropping time; and, with other accidents included, their numbers stood then, on the 26th July,

From Merino rams with Spanish, Southdown, and Cheviot ewes, 76 alive; of do. 6th April, 1807, 59 hogs, loss, 17. Lambs from Southdown and Cheviot rams with Linton ewes, at the above period, 590. As hogs 6th April, 510, loss, 80. Ditto from Bakewell ewes, 26, as hogs, 17, loss, 9. Total number as lambs, 692, as hogs, 586, of loss, 106. By which account it appears, that during the autumn, winter and spring, of the proportions in loss, the Spanish cross was about 4 1-2 in the score, the Southdown and Cheviot 2 3-4, and the

Leicester 7 1-4. The Spanish Southdown and Cheviot crosses met with exactly the same treatment, pasturing promiscuously on the same grounds during the whole period, in which a loss of 97 lambs was sustained on the high pastures, while the Leicesters were kept below; since when to the present time, hardly any further loss has happened among them.

The same disease, braxy, in England called redwater, except in very few instances, occasioned the above loss of lambs and hogs, both upon the open pastures and within the enclosures. No other part of my stock, in the same period, lost above one in 100, and although the hogs suffered so much by braxy, I am informed, this loss on the whole, was not in proportion so great as in any of the neighbouring stocks. This disease consequently requires the most serious attention, as occasioning one of the greatest drawbacks on sheep farming in the Highlands of Scotland. I shall, therefore, before proceeding further in the particular trial of the Merinos, state what occurs to me on the causes and cure of a disease, which appears to be general, and affects them in common with every other species of young sheep, which are now left constantly in the field, in place of being housed at night, as formerly. In my plan of cure for braxy is comprehended an extensive system of agricultural improvement, which I shall also take this opportunity of stating. It is generally supposed, and I think with every degree of probability, that this sudden and fatal disorder is occasioned among lambs, hogs, and even gimmers and dinmonts, by some particular grasses rendered extremely astringent by frost. These appear immediately to affect the urinary ducts of the fattest lambs, occasioning stranguary, and consequent mortification. This happening among the young sheep only, while the same herbage occasions no injury to the sheep of a more advanced age, we may conclude that the latter escape by means of their stronger powers of digestion and secretion.

Indeed, the above hypothesis may be said to be fully proved by the constant instances we have of those different ages of sheep pasturing promiscuously every day in the year, and the young ones only are carried off by braxy. Different plans of prevention have been resorted to, particularly shifting the young stock from one pasture to another, when they begin to die; also putting them on turnip or clover for a short while in the day, which remedies have checked the disorder. As we may thus fairly conclude that the disease originates from too astringent food, rendered noxious previous to the sun's exhalation of the frosty particles, the readiest antidote must certainly be found

in an application of vegetables of a loosening and diuretic tendency, and which are not subject to any noxious conversion of their properties by the influence of frost. Impressed with this idea, and in summer 1805 reflecting on the difficulty of supplying so large a flock of hogs with a sufficient quantity of green crop to save them from braxy, especially when the winter pastures are at a distance from situations where such could be procured, it occurred to me, in looking over these winter pastures, that large tracts of them had in former ages been arable land, and as appears (by the regularity and form of the ridges) at some unknown period when husbandry was better understood than it now generally is in the Highlands. I thought these grounds might by a short process be again restored to their former fertility, and in the process save my young stock frem perishing. In execution of this idea, the stout heath was burnt, and what from constant paring had left for ages an unproductive surface, was laid below by the plough, which re-produced a fine black mould to light. This land was last summer cross-ploughed, I believe to the extent of thirty acres, marl laid on, winter tare, rape, rye, and turnip seed sown, which, I am informed, have a tolerable appearance. As much more ground of the same sort as the plough can accomplish from other works has since been turned up to receive the winter frosts, and marl and green crops shall next year succeed, so that a constant succession of saving food will thus be obtained for the hogs, and a permanent subject of great value produced to the country, from a *caput mortuum*. In case it is thought next spring, that the land which is now in green crop to be pastured off by the hogs, is not capable of producing a good white crop of oats or barley, it will then be put under a regular crop of potatoes or turnips with dung, which manure is obtained, besides what can be spared from my arable farm, by driving what belongs to cotters, who get their potatoe, &c. by that means rent free. Whichever year this white crop may be sown with permanent grasses and reaped, it is calculated to pay the whole expenses of labour, seed, marl, and dung, expended during the three or four preceding years. But this process coming more properly under the head of experimental agriculture, I should not have mentioned it here, only as far as I consider it to be connected with the rearing and security of the young Merino flock, which both in the present and future years will be very materially benefited thereby.

The next trial or circumstance of comparative hardness in each race, to that of numbers sold in the score, was that of actual condition in the month of March last; when it was represented to me the Me-

rino cross appeared in lower condition than the others. I thought this notion arose from the closeness of the wool, making the carcase appear more distinctly than in the other breeds. To ascertain this fact, I directed an account of their average weight to be sent to me, which stands as follows: at the same time their sizes and weight are to be considered according to the supposed weight of their respective sires and dams aftermentioned.

Supposing then all the rams of different sorts to be about the same weight, 14 lb. per quarter, from whence the gross number of lambs proceeded, the ewes are supposed to have differed nearly as follows: Southdown 12 lb. Linton 10 lb. and Cheviot 8 lb. per quarter.

On the 28th March last, hogs of the Spanish and Southdown cross weighed 14 stones; hogs, Southdown and Cheviot rams with Linton ewes, first cross, 3 stones 1 1-2 lb. Spanish rams and Cheviot ewes, first cross, 2 stone 12 lb. which shows that the weight of the latter increased most. Their dams being 8 lb. lighter, themselves only 3 1-2 lb. lighter than the Linton cross. From the above period, 28th March, all the hogs were shifted to a better pasture, the braxy appeared no more, and they continued to mend in condition every day, until we came to the next process concerning them, as to the weight and price of their wool, on an average per fleece, &c. which took place in July last, 1807. Unfortunately for the encouragement of wool growers, that article fell very much in price this year. Mr. Baird, however, gave as formerly 5s. per lb. for the pure Merino. He receives 24 lb. to the stone.

In four Merino fleeces there were 26 lb. which were considered as a stone, make 6l. 10s. per stone—12s. 6d. per fleece—5s. per lb.

Merino rams, with Southdown and Cheviot, laid or smeared hogs, yielding 5 1-2 fleeces to the stone, 2l. 7s. 3d. per fleece—1s. 8d. per lb.

The pure Southdown white wool unsmeared, same price as above.

Hogs of the first cross of Southdown and Cheviot rams, with Linton ewes, took 8 1-2 fleeces, smeared per stone 14s. 6d.—1s. 8 1-2d. per fleece—7 1-4d. per lb.

The Linton white wool washed according to common custom, the same. The wool of the common country breed unwashed, took on an average 10 fleeces for a stone, 8s.=9 1-2d.=4d. per lb. Here occurs a great instance of comparative advantage in the Spanish over the Cheviot and Southdown crosses of the same year, in their respective weight of fleeces, and amount of price, with the produce of the Linton ewes, although crossed by rams so superior to their own breed.

This difference is at the present time more clearly shown by what was at the same period received by the tenants of the common country stocks of ramnoch, &c. where I am informed that although unwashed, it required on an average ten fleeces to make out the stone, for which allowing 8s. (being above the average price) makes the fleece 9 1-2d. and the lb. 4d. as in the above table.

My professional duties this year still requiring a longer absence from home, than proper attention to so large a farm demanded, I in the month of July last let off very advantageously the greatest portion of hill-ground belonging to my farm, and I intend in the ensuing year to sell off the whole of the black faced sort, and these crosses afterwards, with every other breed of sheep on the farm, which has not an admixture of the Spanish; and for them I still retain sufficient summer and winter pasture for maintaining a large number. On this subject I was happy to receive a letter in August last, from my South-country shepherd, who has become a convert in favour of, after being before a most decided opponent to the introduction of the Merino breed. He, in common with all other persons who were reckoned to have skill in the neighbourhood, deprecated their extension as a flock. As I consider him, however, an excellent judge of sheep in general, I read with much satisfaction that part of his letter requesting an addition of Merino ewes, adding, "I shall no more be against the Spanish sheep, for I am sure they will do very well on low grounds, and shall be the most profitable stock that ever came into this country," &c. And why not on the high grounds likewise? My experiments have already ascertained that their lambs of the first clip throve, as well last year and this year, as to hardiness and points of condition, on some of the Highland mountain pastures in Scotland, as any other breed of sheep has actually done in common with them.—And therefore I think we may safely conclude, that the pure breed, when bred there, will answer equally well with the first, or any future clip, or admixture; because it is known from experience, that in the summer months, the Leicester lambs even, or any breed requiring the richest pasture, will thrive very well on high grounds, without diminution of carcase. Our proportion of summer pasture so far exceeding the winter in all parts of the interior Highlands, it becomes an object of the greatest magnitude in sheep farming, to ameliorate the winter pastures, in order to maintain equal number with the summering. This shews the necessity of pursuing the plan of improving the intermediate hills, in the manner above described, as to producing green crops for the young stock. With respect to their produce be-

coming more hardy, and to yield a finer staple of wool than the original stock which we have already introduced, I am sure that we shall, by perseverance, be convinced of both facts, for the following reasons : first, it is known that nature assimulates gradually all animals to withstand the degrees of heat and cold, in the different regions they are destined to inhabit. This operation is particularly observable in sheep. For instance, if you carry any sort of sheep to America or the West Indies from Britain, the wool will degenerate in every generation, whatever attention is paid.* But continue to breed from the best or worst wooled sheep of any race imported to the British Islands, and with proper care, their staple is found constantly to improve. Secondly, as sheep obtain their closest and finest piles, during the winter months, the coldest climate, with wholesome and plentiful pastures, will consequently produce the finest wools. The old Scots white-faced breed, and what is still called the Shetland, are instances of this fact, although these animals, kept in small and irregular flocks, have met with great neglect and bad treatment. But their smallness of carcase has been, and is likely to continue much against their further propagation. Thirdly, as to the fineness of the Merino wool being peculiar to the warm climate of Spain, there can be no greater mistake, as it is only in winter, as here, that the Spanish flocks leave their mountain pastures, from the necessity of obtaining food where it can be found on lower grounds ; and it is now proved by his Majesty's stock, the Bath Agricultural Society, Lord Somerville, and various other breeders of the Merino race, that their wool has already arrived at greater perfection in England, and in New South Wales, even to produce a higher price than what is actually imported from Spain. And, fourthly, I have found, by three winters' experience, that the Merino fleeces have weighed about a sixth more than they did when in his Majesty's flock ; that being kept constantly out, they are more hardy than goats in resisting the severities of the weather in wet or cold, although in this climate goats acquire a much closer and longer pile than the same species are furnished with when more to the southward, and that consequently, there is every reason to believe, when the Merino breed become natives, and brought up to every severity of the climate from lambs, they will prove more hardy than the Linton breed, which, like

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* *Though this be generally believed, no regular experiments have been made to ascertain the fact.*

the goat, has a great proportion of hair in their covering, admitting the rain and sleet without much resistance into their skins, thereby in bad seasons becoming subject to rot and other disorders.

I shall now state the actual number and disposal of my Merino flock for this season, since a very considerable addition has been made to it; and also what increase I expect from it next year.

The hogs of the Spanish cross on Southdown, Cheviot, and Leicester ewes, amount in all to 71, which are in very good order, hardly any lost by braxy, and were treated exactly as the same kinds were last year, except that as lambs, they were kept to the month of November, on still higher grounds than their predecessors. But what has occasioned the greatest increase, and prospect of extended success in the pure breed, proceeds from a lot of 85 Merino ewes, and two rams, which I was fortunate enough to get safely home on the first of October last, out of 100 ewes, and the above two rams which I purchased last September, in Gloucestershire; and notwithstanding a long drive from that country to London, from thence an uncomfortable passage to Dundee, and consequent drive to Lude, they have been mending every day since their arrival, and are now reported to be in such good condition, as to be perfectly proof against the severities of the winter and approaching spring. With them the two former Merino rams have been put; the two rams which accompanied them were put to the Spanish, Southdown, and Cheviot 1st and 2d cross gimmers, together with the Southdown and Cheviot ewes, about 80 in all. And 27 of the shear rams of the Spanish, Southdown and Cheviot 1st cross were put to 470 of the ewes and gimmers of the Southdown and Cheviot 1st cross or Linton ewes. Thus in the ensuing month of July 1808, I expect to have weaned from the above description of ewes about 220 of the 1st class of wool; 120 of the 2d, including 1st cross on the Southdown and Cheviot ewes, and 440 of the 3d class, making in all for clip 1809, about 780 sheep of Merino pure, and Merino admixture. My sales may then commence of young rams and ewes, the hardiness of which will make them answer on any wholesome pasture whatever. In the ensuing year the whole of the other crosses and black-faced ewes will be sold according to particular advertisements which are to be made of them; on which occasions farmers and sheep breeders will have full opportunities on the spot, of examining critically the whole system of management which I have detailed in this letter, and of comparing the nature of the soil and pasture with their own.

After all that has been said, I am sorry to think that from the set-

tled prejudices which ever encounter in their commencement all projects which go to such changes as are here proposed, we can have but feeble hopes of obtaining much attention for a length of time. Being however so much convinced that this breed will be the most profitable that ever came into the country, I should fail certainly in a public and private duty, if I did not continue to strive under every difficulty which may occur, and persevere in these experiments. The efforts of individuals far detached, cannot influence rapidly on a wide extended plain, which has not varied much these last twenty years, in the general breeding of Linton sheep throughout Scotland. In attempting this change of sentiment and practice, as to the introduction of another race, we are to look forward for the continued exertions of the National Agricultural Board, of the Highland Societies, and of such patriotic characters as Lord Somerville, Sir John Sinclair, and Dr. Parry, who will no doubt continue both by their example and writings, to open the minds of the community to a comprehension of this great channel of national wealth: so that before long, his Majesty's paternal intentions of diffusing so great a benefit generally among his subjects, may have their full effect.

As this letter has already extended far beyond the bounds I had laid down with respect to the Merinos at Lude, I shall not now proceed to further descriptions of their success in other quarters, which I have lately heard of. But in the mean time, wishing you every facility in accomplishing your patriotic intentions, I shall beg leave to subscribe myself, with much regard,

Dear Sir,

Your most obedient and humble Servant,

W. ROBERTSON.

SOME CIRCUMSTANCES

RELATIVE TO

MERINO SHEEP,

CHIEFLY COLLECTED

FROM THE SPANISH SHEPHERDS WHO ATTENDED THOSE OF

THE FLOCK OF PAULAR,

Lately presented to his Majesty by the Government of Spain; with particulars respecting that great national acquisition, and also respecting the Sheep of the flock of Negrete, imported from Spain by his Majesty in the year 1791. *From communications to the Board of Agriculture.*

Soho Square, 18th February, 1809.

Sir John,

At a time like the present, when Spanish wools, though at a price unheard of in the annals of traffic, still continue to find a market, thus clearly proving, that their value in the estimation of the consumer is far above any price that has been hitherto offered for them by the manufacturer, and when we must all agree that the interruption of our trade with Spain may still continue for some time longer, I trust that a paper written with a view to facilitate the production of this valuable article in the United Kingdom, and to communicate some information relative to the important present of Merino sheep lately received by our most gracious Sovereign from the Government of Spain, will be interesting to you, Sir, I beg the favour of you, in case you shall approve it, to do me the honour of placing it

at the disposal of the very useful institution over which you preside, with so much advantage to the agricultural interests of this country.

I have the honour to be, Sir,

Your obedient and faithful humble servant,

JOSEPH BANKS.

Sir John Sinclair, Bart. President
of the Board of Agriculture.

Some circumstances relative to Merino Sheep, chiefly collected from the Spanish Shepherds who attended those of the flock of Paular, lately presented to his Majesty by the Government of Spain, with particulars respecting that great national acquisition, and also respecting the Sheep of the flock of Negrete, imported from Spain by his Majesty, in the year 1791.

A considerable part of Estremadura, Leon, and the neighbouring provinces of Spain, is appropriated to the maintenance of the Merino flocks, called by the Spaniards Trashumantes, as are also broad green roads, leading from one province to the other, and extensive resting places, where the sheep are baited on the road. So careful is the police of the country to preserve them, during their journies, from all hazard of disturbance or interruption, that no person, not even a foot passenger, is suffered to travel upon these roads while the sheep are in motion, unless he belongs to the flocks.

The country on which the sheep are depastured, both in the southern and the northern parts, is set out into divisions, separated from each other by land-marks only, without any kind of fences; each of these is called a Dehesa, and is of a size capable of maintaining a flock of about a thousand sheep, a greater number, of course, in the south country, where the lambs are reared, and fewer in the north country, where the sheep arrive after the flock has been culled.

Every proprietor must possess as many of these in each province as will maintain his flock. In the temperate season of winter and spring, the flocks remain in Estremadura, and there the ewes bring forth their lambs in December. As soon as the increasing heats of April and May have scorched up the grass, and rendered the pas-

turage scanty, they commence their march towards the mountains of Leon, and after having been shorn on the road, at vast establishments called Esquileos, erected for that purpose, pass the summer in the elevated country, which supplies them with abundance of rich grass, and they do not leave the mountains till the frosts of September begin to damage the herbage.

A flock in the aggregate is called a Cavana ; this is divided into as many subdivisions as there are thousands of sheep belonging to it ; each sheep, besides being sear-marked in the face with a hot iron when young, is branded after every shearing, with a broad pitch brand, generally of the first letter of the name of the proprietor, and each subdivision is distinguished from the rest by the part of the sheep's body on which this mark is placed.

By the laws of the Mesta, each Cavana must be governed by an officer called Mayoral ; for each subdivision of a thousand sheep, five shepherds and four dogs are appointed. Some of these inferior shepherds obtain the office of Rabadan, the duty of which is to give a general superintendance under the control of the Mayoral, also to prescribe and administer medicines to the sick sheep. At the time of travelling, and when the ewes are yeaning, one or two extra shepherds are allowed for each thousand sheep.

The number of Merino sheep in Spain, is estimated by Burgoyne at 6,000,000 ; these of course must be attended by 30,000 shepherds, and 24,000 dogs at ordinary times, and they find occasional employment for 5 or 10,000 additional persons in the seasons of lambing and of travelling.

In their journey, each subdivision is attended by its own shepherds and dogs, and kept separate as far as may be from all others. The duty of the dogs is to chase the wolves, who are always on the watch when the sheep are upon the road, and are more wily than our foxes ; they are taught also, when a sick sheep lags behind unobserved by the shepherds, to stay with and defend it, till some one returns back in search of it. There are besides in each subdivision about six tame wethers, called Mansos ; these wear bells, and are obedient to the voice of the shepherds, who frequently give them small pieces of bread ; some of the shepherds lead, the Mansos are always near them, and this disposes the flock to follow.

Every sheep is well acquainted with the situation of the Dehesa to which its subdivision belongs, and will at the end of the journey go straight to it, without the guidance of the shepherds ; here the flock grazes all the day under the eyes of the attendants ; when the

evening comes on, the sheep are collected together, and they soon lie down to rest; the shepherds and their dogs then lie down on the ground round the flock, and sleep, as they term it, under the stars, or in huts that afford little shelter from inclement weather; and this is their custom all the year, except that each is allowed, in his turn, an absence of about a month, which he spends with his family; and it is remarkable, that the families of these shepherds reside entirely in Leon.

The shepherds who came with his Majesty's flock, were questioned on the subject of giving salt to their sheep; they declared that this is only done in the hottest season of the year, when the sheep are on the mountains; that in September it is left off; and that they dare not give salt to ewes forward with lamb, being of opinion that it causes abortion.

It is scarcely credible, though it appears on the best authority to be true, that under the operation of the laws of the Mesta, which confide the care of the sheep to the management of their shepherds, without admitting any interference on the part of the proprietor, no profit of the flock comes to the hands of the owner, except what is derived from the wool; the carcases of the culled sheep are consumed by the shepherds,* and it does not appear that any account is rendered by them to their employers, of the value of the skins, the tallow &c.; the profit derived by a proprietor from a flock, is estimated on an average at about one shilling a head, and the produce of a capital vested in a flock is said to fluctuate between five and ten per cent.

The sheep are always low kept. It is the business of each Mayoral, to increase his flock to as large a number as the land allotted to it can possibly maintain; when it has arrived at that pitch, all further increase is useless, as there is no sale for these sheep, unless some neighbouring flock has been reduced by mortality below its proper number; the most of the lambs are therefore every year killed as soon as they are yeaned, and each of those preserved is made to suck two or three ewes; the shepherds say, that the wool of an ewe that brings up her lamb without assistance, is reduced in its value.

At shearing time the shepherds, shearers, washers, and a multi-

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* *The shepherds on discovering the drift of the questions put to them on this head, said that in settling the wages of the shearers and washers, at the Esquileos, allowance is made for the mutton with which they are fed.*

tude of unnecessary attendants, are fed upon the flesh of the culled sheep; and it seems that the consumption occasioned by this season of feasting, is sufficient to devour the whole of the sheep that are draughted from the flock. Mutton in Spain is not a favourite food; it is not in that country prepared for the palate as it is in this; we have our lamb-fairs, our hog-fairs, our shearling-fairs, our fairs for culls, and our markets for fat sheep, where the mutton, having passed through these different stages of preparation, each under the care of men, whose soil and whose skill is best suited to the part they have been taught by their interest to assign to themselves, is offered for sale, and if fat and good, it seldom fails to command a price by the pound, from 5 to 10 per cent. dearer than that of beef. In Spain they have no such sheep-fairs calculated to subdivide the education of each animal, by making it pass through many hands, as works of art do in a manufacturing concern, and they have not any fat sheep markets that at all resemble ours; the low state of grazing of Spain ought not therefore to be wondered at, nor the poverty of the Spanish farmers; they till a soil sufficiently productive by nature, but are robbed of the reward due to the occupier, by the want of an advantageous market for their produce, and the benefit of an extensive consumption; till the manufacturing and mercantile parts of a community become opulent enough to pay liberal prices, the agricultural part of it cannot grow rich by selling.

That the sole purpose of the journeys taken annually by these sheep, is to seek food in places where it can be found, and that these migrations would not be undertaken, if either in the northern or the southern provinces, a sufficiency of good pasture could be obtained during the whole year, appears a matter of certainty. That change of pasture has no effect upon their wool, is clear, from all the experiments tried in other countries, and in Spain also, for Burgoyne tells us, that there are stationary flocks, both in Leon and Estremadura, which produce wool quite as fine as that of the Trashumantes.

The sheep lately presented to his Majesty are of the Cavana of Paular, one of the very finest in point of pile, and esteemed also above all others for the beauty of carcase. In both these opinions, Mr. Lasteyrie, a French writer on sheep, who lived many years in Spain, and paid a diligent attention to the Merino sheep, entirely agrees; he also tells us, that the Cavana of Negrete, from whence the sheep imported by his Majesty, in the year 1791, were selected, is not only one of the finest piles, but produces also the largest carcased sheep of all the Merinos. Mr. Burgoyne agrees with him in assert-

ing, that the piles of Paular, Negrete, and Escurial, have been withheld from exportation, and retained for the royal manufactory of Guadalaxora, ever since it was first established.

The Cavana of Paular consists of 36,000 sheep; it originally belonged to the rich Carthusian Monastery of that name, near Segovia; soon after the Prince of Peace rose into power, he purchased the flock from the Monks, with the land belonging to it, both in Estremadura and in Leon, at a price equal to twenty French francs a head, 16s. 8d. English. All the sheep lately arrived are marked with a large M. the mark of Don Manuel.

The number sent from Spain to the King was 2000, equal to two subdivisions of the original Cavana; to make the present the more valuable, these were selected by the shepherds from eight subdivisions, in order to choose young, well shaped, and fine woolled animals. This fact is evident, from the marks which are placed on eight different parts of the bodies of the sheep now at Kew.

The whole number embarked was 2,214; of these, 214 were presented by the Spaniards, to some of his Majesty's Ministers, and 427 died on the journey, either at sea, or on their way from Portsmouth to Kew. His Majesty was graciously pleased to take upon himself the whole of the loss, which reduced the royal flock to 1573; several more have since died. As the time of giving the ram in Spain is July, the ewes were full of lamb when they embarked, several of them cast their lambs when the weather was bad at sea, and are rendered so weak and infirm by abortion, that it is much to be feared more will die, notwithstanding the great care taken of them by his Majesty's shepherds. A few have since died of the rot. This disease must have been contracted by halting on some swampy district, in their journey from the mountains to the sea at Gijon, where they were embarked, as one sheep died rotten at Portsmouth; there is every reason however to hope, that the disease will not spread, as the land on which they are now kept has never been subject to its ravages, being of a very light and sandy texture.

It is well worthy of observation, that although the Swedes, the Saxons, the Danes, the Prussians, the Austrians, and of late, the French, have, either by the foresight of their governments, or the patriotic exertions of individuals, imported Merino sheep, no nation has hitherto ventured to assert, that they possess the complete and unmixed race of any one Cavana; this circumstance does not appear to have been attended to any where but in England; though in fact, each Cavana is a separate and distinct breed of sheep, not suffered

by the Spaniards to mingle with others. The difference in value of the wool of different Spanish flocks is very great; at this time when Spanish wool is unusually dear, the prima piles are worth more than 7s. a pound, and yet the inferior ones scarce reach 5s.* Even the French, attentive as that nation generally is to all things that concern the interest of individuals, appear to have overlooked this circumstance, and to have contented themselves with making up the numbers of their importations, without paying any regard to it; they have not at least stated in any one of their publications, that attention was paid to the securing sheep of a prima pile, and keeping the breed of that pile pure and unmixed, after they had obtained it.

Our merchants in Spanish wool range the prima piles in the following order of value, as appears by a statement in the year 1792.

Paular.
Negrete.
Muro
Patrimonio, and fifteen more not necessary to be enumerated.

Mr. Lasteyrie, the French writer on sheep, ranges them not very differently; he states them as follows; but both English and French agree that all the prima piles are nearly equal in fineness of fibre, and consequently in value to the manufacturer.

Escurial, called by us Patrimonio.
Guadaloupe.
Paular.
Infantado.
Montareo.
Negrete, &c.

The Danes, he tells us, procured their sheep from the best piles; but there is no appearance of their having, since they obtained them, kept the flock separate, nor are they at present so remarkable for fine wool as the Saxons, whose wool is now at least as fine as that of Spain is, upon an average of prima and second rate piles.

The Swedes were the first people who imported the Spanish breed —this good work was undertaken and completed by the patriotic exertions of a merchant of the name of Alstromer, in the year 1723. The next who obtained an importation of Merino sheep were the Saxons, who are indebted for the benefits they enjoy from the im-

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* *Since this was written, Spanish wools have risen to an exorbitant price; Prima Leonesa is this week rated in the Farmers' Journal at* 20*s. a pound, and Seville at* 13*s.* 6*d.*

provement of their wools to the Prince Xavier, Administrator of the Electorate during the minority of the Elector, and brother-in-law to the King of Spain. The prince obtained a flock of these valuable animals in 1766, and in 1778 an addition to it of 100 rams and 200 ewes. The Danes followed his useful example, as also did both Prussia and Austria. Every one of these countries continue at this moment to profit largely by the improvement these sheep have occasioned in their agricultural concerns. So far from truth is the too common assertion that their wool will not continue fine in any country but Spain, that in the year 1806, when the ports of Spain were closed against us, a very large quantity of fine wool, the produce of German Merino sheep, was imported into this country from Hamburgh, and used by our manufacturers as a substitute for Spanish wool. In truth, some of this wool was so fine that it carried in the British market as high a price as the best Spanish piles were sold for in times of peace and amity.

In the year 1787 the king, guided by those patriotic motives which are ever active in his Majesty's mind, gave orders for the importation of Merino sheep for his own use, and for the improvement of British wool; as it was doubtful at that time whether the king of Spain's licence, without which these sheep cannot be embarked at a Spanish port, could be obtained, it was deemed advisable to make the first purchases in the parts of Estremadura, adjoining to Portugal, and to ship the sheep for England at Lisbon. The first importation of these valuable animals arrived in March 1788, and a little flock of them was soon after completed; but as these were of various qualities, having been drafted from different Cavanas, his Majesty was pleased to order an application to be made to the king of Spain by Lord Auckland, then his Majesty's minister at that Court, for permission to import some sheep drafted from one of the prima piles. This was obtained, and a little flock, consisting of thirty-six ewes, four rams, and one manso, arrived safe and well at Dover, in 1791. These sheep had made a part of the Cavana called Negrete, one of the three piles restricted from importation, and which is likewise remarkable for producing the largest carcased sheep that are to be found among the Merino flocks as has been before stated.

On the receipt of this treasure, for such it has since proved itself to be, the king, with his usual prudence and foresight, ordered the whole of the sheep that had been procured by the way of Portugal to be disposed of, which was immediately done, and directed the Ne-

grete breed to be increased as much as possible, and maintained in its utmost purity.

From that time to the present the opinion of the public, sometimes perhaps two unwary, and at others too cautious, in appreciating the value and adopting the use of novel kinds of sheep, has gradually inclined to give that preference to the Merinos which is so justly their due. At first it was impossible to find a purchaser willing to give even a moderate price either for the sheep or for their wool; the shape of the sheep did not please the graziers, and the wool staplers were utterly unable to judge of the merit of the wool, it being an article so many times finer and more valuable than any thing of the kind that had ever before passed through their hands. The butchers, however, were less timorous; they readily offered for the sheep, when fat, a fair mutton price; and there are two instances in which when the fat stock agreed for was exhausted, the butcher who had bought them, anxiously inquired for more, because he said the mutton was so very much approved of by his best customers.

It was not however till the year 1804, thirteen years after their first introduction, that it was deemed practicable to sell them by auction, the only certain means of placing animals in the hands of those who set the highest value upon them, and are consequently the most likely to take proper care of them. The attempt however succeeded, and the prices given demonstrated, that some at least of his Majesty's subjects had at that time learned to put a due value on the benefit his royal patriotism offered to them. One of the rams sold at the first sale for 42 guineas, and two of the ewes for 11 guineas each; the average price at which the rams sold was 19l. 4s. and that of the ewes 8l. 15s. 6d. each.

This most useful mode of distribution has since that time been annually continued, and the sales have taken place in the beginning of August. The last sale was held on the 17th of August, 1808, when the highest price given for a ram was 74l. 11s. for an ewe 38l. 17s. The average prices of rams was 33l. 10s. 1d. of ewes 23l. 12s. 5d.; a most decisive proof not only that the flock had risen very materially in public estimation, but also that the sheep have not in any way degenerated from their original excellence.

The wool was at first found to be quite as difficult of sale as the sheep themselves; manufacturers were therefore employed to make a considerable quantity of it into cloth, which, when finished, was allowed by both woollen drapers and taylors to be quite as good as cloth made of wool imported from Spain. But even this proof would not satisf the scruples of the wool buyers, or induce them to offer a

price at all adequate to the real value of the article ; it was found necessary, therefore, to have the wool scoured, and to sell it in that state as Spanish wool, which, though grown in England, it really was ; thus managed, the sales were easily effected for some years, at a price equal to that demanded for the prima piles of imported Spanish wool at the times when the bargains were made.

Time and patience have at last superseded all difficulties, and his Majesty's wool has now for some years been sold as clipped from the sheep's backs, the sheep having been washed, and the whole management of them carried on exactly in the English manner, at a price not lower than 4s. 6d. a pound, which allowing for the loss of weight in the scouring, costs the buyer at least 5s. 6d. a pound, a tolerable price for Spanish wool when plenty of it could be produced, though not possibly so high a one as ought to have been given or as will be obtained for the Anglo Negrete pile, when the value of the article is fully understood.

The race of another capital Cavana has now been added to the riches of this country, the Paular, and the draft from it is larger than on any other occasion has been suffered to leave Spain ; the animals have been selected with skill and attention, the pile they belong to stands at the very top of our English list, and the sheep have been most fortunately placed at the disposal of our most gracious King, whose shepherds have demonstrated to the public, in an experience of 17 years of their management of these interesting animals, that they cannot only continue the breed in its original purity, but can also preclude all danger of degeneration in the article of wool. What more can be wished for on this head ?

That spirit of patriotism which induced our sovereign to declare himself the protector of the purity of the Negrete race, will also, it is most earnestly to be hoped, induce his Majesty to extend the same protection to the newly arrived Paulars ; by this measure and by this alone, the public will be effectually guarded against all danger of the admission of impure blood, which the avarice of ill-judging individuals, seeking after a premature improvement of the carcase, has too often, it is feared, introduced into our English flocks. Thus protected, the two-fold treasure obtained for the advantage of his subjects by his Majesty's wisdom and foresight, will become a perennial fountain of true Merino blood, to which those agriculturalists who are wise enough to adopt the breed, may from time to time resort, to correct their errors, if they fall into bad practices, to carry on their crosses, if any such are found to be advantageous, to the highest de-

gree of perfection, and to restore the originality of their stock, if, in consequence of any unsuccessful experiment, it should have suffered deterioration.

26th December, 1808.

OF

THE MERINO SHEEP

IN

ROSS-SHIRE.

Some years ago, a ship freighted by the Earl of Selkirk, to carry Merino sheep from Sweden to America, was stranded near Fort George. The sheep were sold, and purchased by several people, none of whom have paid proper attention to the breed, except Mr. Young, bookseller at Inverness, who, foreseeing the profit likely to be derived from a flock of fine woolled animals, entered on a pretty extensive speculation, which is likely to turn out extremely well. I regret being under the necessity of deferring a more full account of this flock, till I publish my survey of Ross and Cromarty. Mr. Young has not found time to fulfil his promise of sending me a communication for this work. In the mean time I must express my hope that Mr. Young will alter some parts of his management, in order to give every advantage to his Merinos and crosses ; and for preserving the wool so as to send it to market in a proper state for being manufactured. I have lately read some observations on smearing, in the Farmer's Magazine, which are certainly deserving of notice. But I can only remark here, that sheep require smearing in proportion to the coarseness of their wool. The wool of Merino sheep is spoiled, and the health of the sheep greatly injured by smearing. In the summer of last year, I saw some Swedish Merino tups from Redcastle exposed for sale at Beauly. They were part of the descendants of those al-

ready mentioned, but their wool did not betray the slightest symptom of care; it was very coarse and hard. Some gentlemen, who did not seem to be acquainted with the method of comparing fleeces, bought these sheep, which I regret, because I fear they will be disappointed on bringing their wool to market. I trust that the disappointment will be attributed to the true cause. Nothing excites prejudice against any proposed improvement so much as failure in experiment.

Mr. M'Leod, of Geanies, and myself are crossing the Cheviot breed with Merino rams. One of his rams is a Swedish Merino, and the other from the King's flock. I have now six rams; one of them I purchased from John Maitland, Esq. M. P.; two from his Majesty; and the other three were reared on my farm. They were never allowed to go even into an open cot for shelter, and they have withstood the most severe weather. Not one of my Merinos has ever been ill in the slightest degree; and though my ewes are very old, they have yeaned as fine lambs as I could wish for. Mr. M'Leod has not been so fortunate, some of his having died, but all his cross-bred lambs are doing well. I have also a few Southdown ewes, and a considerable number of their lambs from Merino tups. The whole are treated in the same manner, and I am happy to have it in my power to say, that persons who are esteemed good judges of live stock acknowledge my flock to be one of the best in the country. When my experiments shall have been a little more extended, I shall communicate my success to the public. At present, my object is more to multiply the number of my cross-bred sheep, than to be very careful in selection. But, though I have not selected any particular animals for breeding from, I have every prospect of being able to show very good carcases, as soon as the sheep have attained a proper age for being slaughtered.

I have sold my wool this year (1809) at the undermentioned prices:

Southdown,	42s. per stone, of 24 lbs.	Eng.
Merino Southdown, 1st cross,	56s.	do.
Cheviot,	30s.	do.
Merino Cheviot,	44s.	do.
Pure Merino,	7s. 6d. per lb.	Eng.

FINIS.