An Account of the Systems of Husbandry Adopted in the More Improved Districts of Scotland: With ...

by

Sir John Sinclair

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AN ACCOUNT
OF THE
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ADOPTED IN THE
MORE IMPROVED DISTRICTS
OF
SCOTLAND.

VOL. II.
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VOL II.
AN ACCOUNT
OF THE
SYSTEMS OF HUSBANDRY
ADOPTED IN THE
MORE IMPROVED DISTRICTS
OF
SCOTLAND;
WITH
SOME OBSERVATIONS ON THE IMPROVEMENTS OF
WHICH THEY ARE SUSCEPTIBLE.

DRAWN UP FOR THE CONSIDERATION OF THE BOARD OF AGRICULTURE.
WITH A VIEW OF EXPLAINING HOW FAR THOSE SYSTEMS ARE
APPLICABLE TO THE LESS CULTIVATED PARTS IN
ENGLAND AND SCOTLAND.

BY THE RIGHT HONOURABLE
SIR JOHN SINCLAIR, BART.
FOUNDER OF THE BOARD OF AGRICULTURE.

The Third Edition.
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AN ACCOUNT
OF THE
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MORE ESPECIALLY AS PRACTISED
IN ITS BEST CULTIVATED DISTRICTS.

CHAPTER II.

Sect. XI.—Of Soiling.

By soiling, is meant the feeding of stock with cut green food, instead of pasturing them.

The origin of the word soiling is unknown. Mr Young supposes it to be a mere farming barbarism*. The introduction of soiling into England is also unknown. Hartlib mentions it, as a practice in Kent about the middle of the seventeenth century. It was very general in Hertfordshire about seventy years ago. It was probably derived, like many other useful practices, from the

* Some imagine that soiling means making soil, that is, according to Johnson, "slakh or dump."
OF SOILING.

Flemings*. It certainly has been long known abroad, and several interesting communications regarding it, will be found from its foreign correspondents, in the earliest publications of the Board of Agriculture†.

The soiling of horses was introduced into Scotland about fifty years ago. It was practised, however, but by a few, and it was not till about the year 1778, as Mr Brown of Markle informs me, that the system of regular soiling took place in East Lothian‡. Before that time, horses generally received a small quantity of clover during the night, but were herded in the forenoon, and the evening, on the pasture lands, by the boys then employed as plough drivers.

* Cromwell gave 1,100, a great sum in those days, to establish the husbandry of Flanders in Hertfordshire.
† See Baron D’Alton’s Letter, annexed to the Middleses Report, and Dr Thaer’s paper printed in the second volume of the Communications to the Board.
‡ Lord Kames has given a curious description of the old mode of feeding horses in the summer season, in Scotland. He describes them as being fed in balks between ridges of corn, and often reduced to thistles, the time of the men being consumed in collecting, and that of the horses in eating them. This was a kind of soiling. Sometimes, what was called bained grass, was reserved for them: but how often did it happen, that the man appointed to attend them fell asleep? and the horses then trespassed on the corn;—dogs were employed to chase them from it; the horses were driven about, and their fatigue was little less than when they were at work. If they were tethered on the bained grass, the half of the produce was lost, being trodden under foot; the horses also often broke loose, and destroyed the standing corn. Even in inclosures much of the produce was trodden under foot; the horses were pestered with flies in hot weather; they could not feed with ease; they had no time for resting; and much time was lost in laying hold of them for the yoke. Besides, few inclosures were then in sufficient good order to keep in horses when they saw corn; and, if they once broke out, it was in vain to think of imprisoning them afterwards.—Kamo’s Gentleman Farmer, p. 172.
After two-horse ploughs were introduced, soiling was generally resorted to, and has been more or less followed ever since the introduction of clover into general husbandry. A few farmers, however, still think it beneficial to run their horses in an inclosed field through the night.

Lord Kames, in his Gentleman Farmer, published in 1776, has strongly inculcated the advantages of soiling, and boldly declares, "I despair not to see all the corn farmers in Scotland depending on red clover for the summer food of their cattle." His hopes are fortunately now in a great measure realized.

This important subject shall be explained under the following general heads: 1. On the articles used; 2. On the different sorts of stock thus fed; 3. On the advantages of the practice; and 4. On its disadvantages.

1. The article principally used for soiling are, red clover, (with a mixture of rye-grass) and tares. Sometimes lucern, barley, oats and beans, are resorted to; but sainfoin, though cultivated in many parts of England, is unknown in Scotland.

Red clover, with a mixture of rye-grass, is the article by far the most generally cultivated in Scotland for soiling; nor is that to be wondered at, considering the facility with which it is raised, and the luxuriance of its produce. Lord Kames calculates, that a horse of a middling size, will eat ten Dutch stones of clover and rye-grass daily; some, however, will go the length of sixteen or seventeen stones. An

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* Gentleman Farmer, part 1, chap. 9, sect. 1.

† One of my correspondents states, that he thinks soiling with rye might turn out well, as the surest and earliest growth known in this country, more especially if cut with the sap, before it shoots. But this idea has not been justified by experiments.
ox or cow will eat about eight stones. Even at these rates, a good crop of red clover will feed a number of animals on an extensive field.

White clover is but a small plant, and not easily collected in heaps for food; but it is astonishing the quantity it has produced, when frequently cut, and manured with coal ashes.

Lord Kames strongly recommends sowing a mixture of yellow clover with rye-grass and rib-grass, but cocksfoot would probably answer better. These plants are earlier by a fortnight than red clover, may be cut about the middle of May, and if the season is favourable, they may be again cut as late as even the middle of November.

Lucern has been tried in Scotland, on a small scale, and has completely answered. An account has been already given of the success attending the culture of tares. It may be proper to add in this place, that it has been found highly useful to mix some oats among the tares, to keep them from the ground in wet seasons.

One of my respectable correspondents, (George Culley, Esq.) informs me, that he has known barley and seeds, (that is, clover and rye grass) frequently sown together and cut before the barley shoots, when it produces a great crop, and afterwards a good second cutting, affording an excel-

* Gentleman Farmer, p. 178. Mr John Shirreff remarks, that no conclusion can be drawn, as to quantities of herbage necessary to support the different animals, unless their weights be specified. An ox of eighty stones will eat as much as two of forty stones each; and a London dray horse would probably consume as much clover as ten Shetland ponies.

† A new species of white clover has been lately discovered in Essex, which it is supposed will be as productive of herbage as the common red.
lent food when soiled, either for horses or cattle. Winter barley may be cut once, and will afterwards produce a crop of grain.

Some cow-keepers near Edinburgh sow their cows with cut barley. Finding that clover was apt to fail on the rich lands near Edinburgh, owing to the heavy crops of barley which these lands produced, they resolved, instead of keeping the barley to be ripened, to cut it for their cattle young, a practice that has been found to answer. The first crop is equal to clover, and the cows are as fond of it; the second crop is not so good as the second crop of clover, but is far from being deficient, and would be more abundant if they would only cut the first crop earlier. At the same time, the greater the proportion of clover the better, as grain crops cut green are harsher than clover, tares, and other leguminous crops, and have not so feeding a quality.

Instead of tares, an intelligent correspondent soils four or five acres of Tartarian oats, commencing about a fortnight after Midsummer. He finds this plan to answer uncommonly well, but he begins soiling with clover and ryegrass. The oats should be sown at different periods, to come in succession.

In Ayrshire, whenever the crop of beans is not likely to be productive of pods, Mr. Blane of Blanefield informs me, that they are mown down as green food for horses, who are fond of that food, after being a little accustomed to it. This however, at least, is but a rare practice. It has been tried with stall-fed oxen, and they thrive, it is said, better on that food than on any other.

2. The different kinds of stock soiled: 1. Horses; 2. Cattle; and, 3. Pigs; and the manner in which they ought to be respectively treated shall next be treated of.
1. Horses.—There cannot be a doubt of the advantage of soiling working horses, a practice which Mr Rennie of Phantassie considers to be almost indispensable, upon all corn farms, as it enables the farmer to make his summer-threshed straw into dung, and to procure a greater quantity of work from his servants and horses. It is thus indeed, that a large quantity of valuable and rich manure is produced, by which alone he is enabled to carry on his rotation of cropping to the same advantage. The following is a short sketch of Mr Rennie’s practice of feeding horses through the year. He generally gives them cut grass about the 9th of June, or when the grass is fit for cutting. He employs one man to cut and bundle the grass, which he will do for twenty to twenty-four horses, with a little assistance occasionally; and having an interest in making as little waste as possible, he takes care to give no more than what is absolutely necessary. The horses are kept on the first crop until it begins to get hard and dry, when, if the second crop of clover is not ready for cutting, they get tares, of which he always takes care to have a plentiful supply, with which, and the second crop of clover, they are carried on until the end of October, a week or too sooner or later, as the season may answer. During all this time, they get corn, more or less, according as they are wrought. When the second crop of clover and tares is consumed, he then begins to feed with his best hay and corn. Good feeding, at that season, he finds of the greatest importance; as much of the horses’ future health and strength, for the next year, depend on the good management of them when taken from green to dry food. After a month’s good feeding with corn and hay, by which time the hardest of the labour is generally over, he puts them on peas and bean straw, with a feed of boiled beans mashed up with a little ground barley, and which they get every evening; this
keeps their belly open, and in a great measure prevents the bad consequences that often arise from damp peas or bean straw. In this way he feeds them, until the first or second, or perhaps third week in April, according to the quality of the bean straw, and then puts his horses again on hay, on which they continue until they get cut grass. Besides the advantage already mentioned, he remarks, that if his twenty plough horses were to be grazed, it would require a field of at least thirty to forty acres of extent, in order that the grass might be sufficiently good to allow the horses time to fill themselves, and to have time to rest. Think of the waste that must be occasioned by these horses trampling over it, besides what must also be wasted in the pursuit of catching them for the yoke. Mr Rennie has no doubt that one half the quantity of ground, when soiled, will feed the same number of horses. He adds, that a horse that is from nine to ten hours a-day in the yoke, has no time to gather his meat; he therefore ought to have it laid down ready for him in the stall, to begin to eat when he comes in from his work, so that he may instantly fill his belly, and retire to rest.

Another correspondent informs me, that he keeps for the cultivation of his farm twelve horses, and for their maintenance, he appropriates twelve acres of broad clover, with a mixture of rye-grass; this, when a full crop, he calculates will serve them five months, and will admit of four acres of the first crop being made into hay; the whole of the second crop they will be able to use green, even although twelve double cart-loads of good stable-dung per acre should be applied immediately after the first cutting, which will always secure a good second crop, and in a moist season will produce a very heavy one. The dung so applied, however, ought to be very short, and well made, otherwise, it will be
liable to mix with the clover, in cutting and raking*. My correspondent also reckons it, one of the best preparations for a wheat crop with one furrow after the clover; much nitrate, however, is required in spreading the dung, and a heavy stone-roller, drawn by two horses, will be applied with great advantage, as soon as the dung becomes dry after spreading; for, without having recourse to this expedient, much of the dung would be raised in the second cutting, and a considerable quantity of the grass would be lost, from the inequalities formed by it on the surface, which would prevent the application of the rake; and it also has the advantage of incorporating much sooner with the soil without any waste. He generally commences cutting broad clover for the stable, in the last week of May or first days of June, and continues until about the end of October; after that time the horses are put on hard food.

An objection has been urged to the practice of sowing horses, namely, that it is difficult to provide them with young grass†; but that is completely obviated by the practice

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*It is said, that the clover produced by new dung, must be rank and unpleasant, and that it would be more advantageously applied to the turnip crop. But where there is no land fit for turnip, that objection is obviated.

†Mr Semerville states, that among the disadvantages attending sowing, one is, that before the second crop is fit for cutting, the first gets too tough, stock do not eat it well. The objection, however, is easily removed by the cultivation of as many tares as will supply the interval between the first and second cutting; a practice now very generally followed. Indeed, Mr Hume of East Barns informs me, that he is accustomed to cut down five or six acres of his young crop of clover, on which he pastures 14 horses from the 15th of April to the 1st of June, when the other grass is ready for cutting, and it never fails to give a good crop when the first crop begins to turn too hard for the horses. This plan saves many horses lives, and a great deal of more work will be got from horses thus fed, with two feeds of corn, than from the same horses that get three feeds and the best hay. There
adopted in Roxburghshire and other districts. The clover that is intended to be cut early, is always saved in the spring months; but such as is meant to be cut in the last half of July, and the second and third weeks of August, is always eaten down by the sheep in the spring; by which means it is in a good state when the other becomes hard and unpalatable. This method is also followed by Mr Brown of Markie, who thereby seldom fails of obtaining green food of the best quality for his working stock, not only at the critical period here alluded to, but also to the very conclusion of the grass season.

Mr Nisbett of Mersington, in the spring, puts in ewes and lambs on the new grass, in the proportion of two pair per acre, and sometimes more. He occasionally also eats the herbage of a part of his hay land *, in the spring, with his fattening sheep, when he wishes to keep them back for a good market; and that part he cuts for the horses before the second crop can be ready. This insures the horses a succession of young grass, on which they thrive much better than when it gets dry and stalky.

It is certainly desirable, by following this practice, to keep the clover young and nourishing, even though a great

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* It is remarked, that there is certainly a risk in spring, eating a part of the herbage of the land intended for hay; as in proportion as it is eaten, as in proportion is it exposed to the influence of the sun and cutting winds, and more liable to the injury of drought. It so seldom happens, however, but there is a powerful supply of moisture at or about Whitsunday, Old Style, that the injury dreaded can rarely happen. At all events, it is desirable not to cut the young grasses too bare.
In regard to soiling, a respectable correspondent makes this distinction, that where there is grazing land of good quality annexed to the farm, it is, in point of convenience, of less consequence; where that does not take place, it seems both profitable and necessary to soil with red clover and tares. If the rich grazing land, however, can be cut for soiling, would it not be desirable to adopt the soiling system, if one acre will go as far as two?

Mr Somerville of Athelstonford Mains, is decidedly in favour of soiling, thinking it scarcely possible, that the labour of a farm, according to the present system, could be well carried on, if horses were fed otherwise; besides, in that way, one acre of grass will go as far as two eaten on the field, whilst the straw threshed in spring and summer is thereby rapidly converted into rich dung.

Mr Somerville gives the following estimate of the expense of soiling horses, and of the manner in which it ought to be conducted. He estimates, that a Scotch acre is, in usual seasons, consumed by a pair of horses.

Two horses nine weeks, first cutting at 10s.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>per week</td>
<td>L.9 0 0</td>
</tr>
<tr>
<td>Two ditto, four ditto, second cutting, at 10s.</td>
<td>4 0 0</td>
</tr>
</tbody>
</table>

Total value of the produce, L.13 0 0
Deduct for cutting and carrying home, 2 0 0

Clear profit per acre, after paying expenses, L.11 0 0

Besides the value of the dung accumulated during the process, which may be fairly estimated at L.3 per acre.

Such a crop, if made to hay, will rather exceed 200 stones.
OF SOILING.

per acre Scotch, of 22 lb. avoirdupois to the stone. If the same were depastured and allowed to get well up, an acre would keep one horse for thirteen weeks; hence Mr Somerville considers, that one acre of clover and rye-grass, according to the soiling system, will feed the same number of animals that two will do, when the ground is depastured.

He generally begins cutting for soiling in the first week of June, though at first he goes over much more ground than afterwards, yet the second crop is much better, and what is early cut, comes in succession when the first crop gets old and tough. He never has grass that will cut a third time with advantage. His horses get water twice a day, which he thinks indispensably necessary for working stock*; if water is in the court, where they can take it at pleasure, so much the better.

Milch cows give more milk when soiled than when pastured, provided due attention is bestowed in furnishing them with a regular supply of grass at stated periods, say six times each day, and keeping them clean and free from nastiness. The very trouble that is saved by milking the animals in a byre or cow-house at hand, instead of going to a distant field, is of considerable importance.

Lord Kames stated, that many a summer, for seven or eight weeks running, his horses had been daily employed in bringing lime from a quarry fifteen English miles distant, fed on red clover only; and at the end of the season they were as plump and hearty as at the beginning; but all intelligent farmers are now of opinion, that it is necessary to give horses a feed of oats per day, when they are carrying

* It is found by experience, that even posting horses do well soiled, but then they must get no water. When fed on moist and succulent herbage, the less water, in general, the better.
lime, coals, or other heavy articles, to or from any considerable distance.

Mr Wilson of Simprin, in Berwickshire, approves of soiling in the middle of the day, in hot weather; but he states, that it is not generally practised in Berwickshire, where the work-horses are accustomed to move quicker than in the Lothians. He does not think that it would answer in every situation; and is of opinion, that cut grass is too soft a food for horses used in driving lime. By giving a feed of oats, however, that objection would be removed.

It is also contended, that horses are much better to be out a few hours on pasturage every day, instead of being kept constantly in a stable, in consequence of which, they are apt to turn stiff, and never thrive so well. But this objection is obviated by the practice of a number of respectable farmers, who, when they soil their horses, give them their green food in bins in the yard, instead of feeding them in a stable; and Mr John Shirreff remarks, in regard to the idea that horses, when soiled, are liable to become greased, it is not well founded. There are few greased horses in East-Lothian, where cut clover is constantly used for soiling. Indeed, the idea of horses becoming greased when regularly fed, and wrought with moderation every day, is absurd. Exercise is the surest preventive. It is in winter that draught horses are most apt to become greased, from wet roads, and want of exercise.

Mr Somerville of Athelstonford Mains is convinced, that young draught horses may be reared much cheaper by soiling, than in open pastures;—a point of considerable moment to industrious farmers.

2. Cattle*—Though many are of opinion, that it is pro-

* Mr Curwen strongly recommends soiling milk cows. He says, that
fitable to soil horses, yet this practice is not so generally approved of in regard to cattle. Mr Brown of Markle, however, has, with his usual ability, given a very satisfactory account of an experiment he tried, which seems decisive of the question *. In 1805, he soiled twenty-four Aberdeen-shire cattle; and after giving a full detail of the expense and profit, computes the gain to be fully 50 per cent. when grass is consumed in that manner, even when no additional sum is stated as the value of the large quantity of fine dung thereby manufactured. From this account, it appears, that these twenty-four cattle were completely fed, from the first of June to the first of October, upon eleven acres of clover and tares; and he now informs me, that he is quite satisfied; it would have required eighteen or twenty acres of the same grass to have fed them had they been pastured upon the field. This is a decisive fact in favour of the system, especially as Mr Brown had an equal number of cattle in an adjoining field, which did not sell one halfpenny higher than the soiled ones, though they consumed or destroyed a great deal of more grass. With the exception of one season, when his clover field was at a great distance from the farm-yard, Mr Brown has regularly soiled cattle since the above period.

The soiling of cattle, indeed, is of more importance upon clay-land farms, than where the turnip soil prevails, as in the former it is difficult to use the straw to advantage in any other way; whereas upon a turnip farm, it is hardly possible to reserve straw for the purpose of soiling, and it

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*a cow of the short-horned breed will require eight stone (14lb. each) of cut clover, in the twenty-four hours; but with smaller breeds, there can be no doubt, that a less quantity will suffice. Report to the Workington Society, anno 1810.

cannot be done without straw, or some other substitute. On
the other hand, it is maintained, that sometimes half the
turnips may be eaten on the field, without any straw being
used: that a considerable saving of straw may be effected,
by bottoming the yard with moss, earth, ashes, and other
such articles; and that if straw be economically applied in
littering turnip-fed stock, there will be abundance to litter
a good many soiled in summer, where good and luxuriant
crops of grain are raised.

A detailed account has been transmitted to me, regard-
ing the proper mode of soiling cattle, by Mr James Cuth-
bertson of Seton Mains in East-Lothian. He recommends,
that cattle, intended to be kept in this way during the sum-
mer, ought to have some succulent food given them, at least
four weeks before they are entirely confined to eat green
clover, and for the first fortnight, a flake with oat straw, or
a little hay, should be kept in the court, because at that sea-
son of the year, the grass being strong, its laxative effects
are so powerful as to prevent feeding. Plenty of water
ought to be constantly kept in the court; an open shed also
for the cattle to retire to, in hot weather, would be a great
comfort to them, and very materially aid their feeding; and
if it is found that they do not frequent it, he would recom-
mand keeping them at the stake during the heat of the day:
recourse likewise ought to be had to the byre or cow-house,
during any continuance of wet weather. There food ought
to be given them four or five different times a-day, so that
it may be always fresh, and new cut, which will prevent the
waste that would otherwise be occasioned by giving them
large supplies at a time, and will also induce them to eat
more plentifully. Regular litter should be given them, and
the court kept as smooth as possible, in order to preserve
them from being overheated when they lie, which they
ought to be encouraged to do as much as possible.
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It is also of much consequence, that regular attention should be given to keep them clean, so as to prevent a foulness of the skin, which may happen if the weather is warm, and litter not plentifully and regularly supplied. When the soiling of cattle is intended to any extent, it ought to be adverted to, in sowing the grass for them, that less rye-grass than is commonly used for hay, should be sown with the clover; likewise, that when the clover begins to get hard, some tares, sown early in the spring, ought to be substituted in its place. In East-Lothian, it rarely happens that the weather will permit the cattle to lie out after the month of September; but as this in general is too early for commencing feeding with turnips, unless the weather is dry and warm, it would be better to feed them at the stake, upon the second crop of clover, which at this time will be in its best state for feeding. Some recommend a few oats on the straw to be given, for the first month after the cattle are changed from the clover to turnips; but in my opinion that expense is not necessary.

Mr Hope of Fenton found that young cattle, tied to the stake, improved much to his satisfaction. From their age he could not expect them to fatten for the butcher. He would prefer, at the same time, allowing them liberty to feed in an open yard, with a proper shed, into which they might retire when they thought proper, to the stake. He thinks, however, that cattle will thrive better constantly tied up in a well-aired house, than confined in an open yard, without having an opportunity to take refuge from the heat of a summer's sun, and the vermin that harass cattle at that season of the year. Water was brought into two yards, where he tried his experiments, for the use of the cattle; those in the house were let out once or twice a-day, according to the nature of their food, to drink, upon doing which they were immediately tied up again. He
found it of the utmost consequence to have them always well supplied with water, especially when the grass begins to turn hard, as he observed once or twice, when the servant had neglected to supply them in proper time, (although for a very short period only), that scarcely a beast thought of putting his mouth to the grass, but all stood looking with the greatest earnestness till relieved by a proper supply of that necessary element. Wherever soil ing, therefore, is to be practised, he holds it of the first importance, that a plentiful supply of water should constantly be at hand, completely independent of a servant to supply the yard, either by a pump or other manual operation *.

Some farmers in Berwickshire, who long persisted in the system of soil ing their young cattle, have now abandoned it, from the idea of its insufficiency to raise stock, to the same weight and size as they would have reached, had they been grazed in the common manner. They admit, however, that beasts, by being soil ed, may be well prepared for being laid on turnips in October; and they ought to

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* Mr. Low observes, that though an abundant supply of water is, in general, proper for cattle, yet that less is necessary, when fed on such moist and succulent food as cut grass. He has learned from good authority, that young horses and cattle have been known to thrive very well in a pasture field, without a drop of moisture more than they obtained from the dew on the grass in damp mornings. This, however, is not to be imitated; and where the water is not conveyed to the court by troughs or otherwise, the cattle must be driven to it at least once a-day, and allowed ample time to drink. If the water be near at hand, it may perhaps be advisable to water them twice a-day. It is remarked, that calves should never be allowed any water during the first six months they are turned out to pasture; for when they are allowed to drink much water at an early age, they will become big-bellied, and otherwise misshapen. Grown cattle, however, cannot do without a sufficiency of water, more especially when living on dry and coarse food.
consider, that it is not the weight or size of any individual animal, but whether more value can be raised on an acre soiled, compared to one of a similar nature pastured, that must determine the question.

An intelligent correspondent, (Mr Stewart of Hillside), informs me, that he has been in the use of giving cut clover to milk cows in the months of July and August, when the weather is hot. At that season they come in from their pastures between eight and nine in the morning, and are not put out again till four in the afternoon; in that interval they get a full feed of clover. The advantages of this to the pasture, the cattle, and their produce, are evident. He reckons, that an acre of ordinary clover, will serve fifteen cows for this purpose, for two months. Others have tried giving cows clover in the yard, but found that they did not give so much milk as when they were at pasture. That, however, is not inconsistent with the advantage of soiling them in the middle of the day.

Mr Park is of opinion, that a supply of water is very requisite when cattle are put on clover; and if a running stream cannot be obtained where they are kept, a pump-well, with attention, may supply its place. On the whole, he is of opinion, that there is more advantage to be derived from soiling horses than cows. That, however, is a point that has not yet been so fully ascertained as, I trust, will soon be the case.

Mr John Shirreff has suggested the following practices in regard to soiling, which seem to me peculiarly valuable: 1. That in hot weather the herbage should always be given them in sheds; and, 2. That a supply of the best old hay should be given them in wet weather, else the stock must fall off much in their condition, for there is only a certain quantity of moisture which an animal can take into its
stomach with safety, and if that is exceeded, the consequences must be fatal.

8. Pigs.—Mr Church of Hillchill also soils pigs on clover, and finds it an advantageous practice. Where cottagers have gardens, and keep pigs, it might be expedient to have a small spot of clover in their gardens to cut for them. In regard to soiling pigs, a discovery has been made of considerable moment. It is, that pigs may be soiled on cut green beans, with great profit, and that they are ravenously fond of them. The Windsor sort is preferred, and the beans should be planted at three different times, for the sake of a regular succession. The feeding may commence in the beginning of July, and may terminate about the end of September. When pork is worth 7½ per pound, the profit, besides a quantity of most valuable manure, is calculated to be about £10 per English acre.

We shall now proceed to state the advantages of soiling, and the profit to be derived from it.

1. Soiling is peculiarly calculated for clay-land farms, more especially if they are situated at a distance from any town where there is a demand for straw. By means of soiling, that straw can be converted into rich dung, which otherwise could hardly be of much value. Upon turnip-land farms, where cattle are fed, the straw is consumed during the winter, and little, if any, can be reserved for soiling. In regard to either description of farms, it is a maxim to be rigorously observed, “That wherever a crop produces three tons of clover, or meadow-grass, per statute acre, at two cuttings, and where the distance does not exceed half a mile, soiling ought to be adopted.”

2. Another circumstance strongly in favour of soiling, is mentioned by Mr Hume of East Barns. He states it as a
positive fact, (though it may seem extraordinary), that all the lands in his neighbourhood, will produce a better crop of oats, the year after the grass was cut for hay, or for soiling, even twice in one season, than if the grass had been pastured by sheep; and that this takes place, not only on land full of manure, but even where inland districts are managed in the four-course shift of turnips, white crops, grass, and oats, and receive no manure but a thin dunging in the turnip drills. The same circumstance is stated by Mr Brown of Markle, who has made trials of the cutting and pasturing processes, upon soils of almost every description, and uniformly found, that oats taken after cutting grass, were superior to those taken upon a pasture field. The produce of the land, however, must be consumed upon it, and not sold off, unless a fair proportion of putrescent manure is purchased back.

3. The saving of land is a most important consideration. Mr Walker of Wooden is of opinion, that one acre of cut grass soiled, is equal to three used as pasture. But in turnip land ARMS, where sheep are partly fed in the fields, much straw, as has been already noticed, may be reserved for summer soiling. Mr Somerville states, that one acre of cut clover is equal to two pastured, even of the same field, unsoiled with the same grass, the clover not being trampled upon, and growing so much faster than if it were often corroded by the teeth of an animal: and another correspondent is of opinion, that 16 acres of clover and tares, will feed as many horses and cattle, as 36 acres of the same kind of grass would do, if used in pasturage.

4. There is also a great saving of food; for animals, when pastured, destroy a great deal of keep in various ways, not only corroding the herbage by their teeth, but by trampling upon it, poaching it, particularly in wet weather, lying down upon it, dunging, and stalling. All these are
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prevented by cutting the herbage, and carrying it from the field.

5. It has been justly observed, that by soiling, a great quantity of rich and valuable dung is produced, when none could otherwise have been procured*, which may be used upon the cultivated fields, with far greater advantage than could be obtained from the portion of dung left by the animals upon the same field, in the event of its having been depastured; for in this case, much of it would have been scattered on the grass land; much of it wasted by evaporation, dissipated by the sun and air; and much of it carried away by insects. This advantage alone is sufficient to compensate for any trouble or expense attending the practice, more especially on farms lying at a distance from towns, and where manure cannot by any other means be obtained: besides, as the dung and urine of cattle are much stronger in summer than in winter, it is possible, by this means, to procure a species of manure of a very superior quality. Before soiling was introduced, a large quantity of straw always remained after the cattle were turned out to grass, which never could be made half so valuable as under this system†. Under the old system, horse dung, in a pasture field, was almost totally lost, for it was soon eaten by flies, or dried and withered away. Indeed, by its heat, it burnt the grass it fell upon, instead of improving it.

6. Another advantage is, that cattle and horses are not

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* It is said, on the subject of the muck produced by soiling, that it is not perfectly correct to state all the profit derived from that article to the acres soiled, as the land producing the straw must likewise be taken into consideration. This, however, cannot be carried to the full extent, as, without soiling, the straw might not be convertible into dung; at least, into dung, one half so valuable as when it is manufactured by that process.

† Communication from Mr. Brown of Cononayth, by Arbroath.
liable to the same accidents as under the pasturing system. They are not so apt to be 

**have or blown,**—a misfortune by which many farmers have suffered considerably *°. When milk cows are soiled, it is remarked that they escape the 

**grips,** which is a great enemy to them when out, more especially in wet seasons. In the fields also, cows, when pasturing, are often frightened, when in a thriving state, and prematurely slip their calves, to the great loss of the proprietor. Besides, it is well known, that pasturing horses and sheep together, is extremely injurious to the sheep stock; going on the same land, which, by the process of soiling, may be obviated †.

7. This practice is also of great use in preventing damage, not only to fences, but to underwood, corn, &c. by breasty cattle; and it prevents all the danger of cattle being staked, or otherwise hurt by breaking fences ‡.

8. It is likewise contended, that the practice is advantageous to cattle in a feeding state, as they require, that a sufficient quantity of food to satisfy their wants, should be given them in a short space of time, and they fatten quicker by lying much at rest §.

9. Working horses or cattle are saved all the fatigue of

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* A beast that chews the cud, takes in at once a large quantity of green food, especially of red clover, which is extremely palatable when young. So large a quantity is apt to ferment with the heat of the stomach, so as sometimes to make the creature burst. This is considered as a formidable objection to the feeding horned cattle on red clover; but it is easily obviated by feeding them in the house: servants will not readily give more than sufficient, when cutting and carrying is a work of labour.—Sume's Gentleman Farmer, p. 176.

† Kerr's Berwickshire, p. 272.

‡ See Sir C. M. Burnett's paper in the Communications to the Board of Agriculture, vol. vi. p. 2.

§ Adam's New System of Agriculture, p. 11. and 12.
collecting their food after their work is over; they can fill themselves consequently much sooner, have more time to rest, are protected from the heat of the sun, and the attacks of insects, can be kept in higher condition, and are able to do much more work. In regard to horses, in particular, after having worked nine or ten hours each day, they must stand in need of rest during the cessation of their labour, and this can be better obtained in a cool stable, or open shed, with plenty of litter, than in an open field, where they are exposed to the weather.

Lastly, Working animals are rendered much more tractable, take a liking to those who furnish them with food, and, instead of being sought for in the fields, and being caught with great difficulty, they are always ready for their work. Besides, in the stable, they are not tormented with flies as in the fields, nor are they induced to stand in brooks, or ponds of water, nor under the shade of spreading trees or hedges, by which much valuable pasture is lost.

It may likewise be observed, in the words of Mr Brown of Markle, that the real test of the utility of soiling, is not, whether cattle can in that way be so completely fattened as by pasturage? but whether or not an acre of clover grass, can be consumed with more profit to the farmer, by soiling, than if cattle were allowed the liberty of pasturage upon it? This is the true view which ought to be taken of such a question.

The profit derived from this practice may next be explained.

Profit from Soiling.—There is certainly no mode by which artificial grasses will pay so well, as by soiling. In the neighbourhood of towns, from the necessity that cow-feeders and carters are under for such food, the value of clover is immense. Indeed, according to a communication from.
Mr Low, L.25 or L.30 per Scotch acre, are no uncommon prices, for the produce of land cut for soiling, which, if it had been let for pasture, instead of being cut, would not have brought more than L.9 or L.10 per acre. Mr Bruce of Grangemuir, in Fife, makes the value of cut grass per Scotch acre, deducting the expense of cutting and leading, L.9, and the profit from dung L.3, 10s.; consequently the total value of one Scotch acre, be calculates to be L.12, 10s. Mr Somerville states the produce at L.13, the expences L.2, leaving the value per acre, where the produce is consumed by soiling horses, L.11 per acre, besides the dung. Mr Kerr, in his Report of Berwickshire, p. 262. states, that an English acre is worth from six to eight guineas, (besides the dung), according to soil and seasons, which does not, differ materially from Mr Bruce's statement, whose calculation refers to the Scotch acre. It is said, that an acre of clover and rye-grass, cut and used green, is of equal value, with the produce of the same acre made into hay; and that there is much less risk, whilst at the same time a great quantity of excellent muck is procured. But Mr John Shirruff remarks, that this point must depend upon various circumstances; as the price which the various articles will fetch, or the purposes to which they are applied, which will vary in different situations and districts.

It must not be imagined, however, that this practice, however excellent, is not liable to some objections. These shall be shortly enumerated.

1. It is first objected, by those who disapprove of soiling horned cattle, that in close coverts, the benefit of good air and cooling breezes is exchanged for putrid effluvia, and a noxious heat from different sources; and that the annoyance from insects and vermin, in such a situation, must be greater than in the fields. Here I must however remark,
that where proper sheds are erected, the latter part of the objection is altogether groundless. I may also add, that the daily experience of cattle thriving, though confined, sets aside the whole of this objection. Besides, horses or cattle might be kept in hamnels, (as they are called in Berwickshire), or small folds, with covered sheds, to resort to in hot or in bad weather, where they would not suffer from confinement. Indeed, covered sheds alone, when properly constructed, are much cooler in hot weather, than the open atmosphere, and are not infested with insects or vermin.

By the same plan of hamnels, another objection is obviated, namely, that if animals of different strength are confined together, the weaker cannot obtain an equal share of food with the stronger; for by the hammel system, the weak and the strong may be separated.

2. The second objection is, that the chances of accident and disease are greater, than when the cattle are allowed the natural way of seeking their own nourishment: but it is evident, that they are liable to many more accidents without doors, than within, and, besides, are exposed to the inclemency of the seasons.

3. It is also objected, that in wet soils or seasons, fields are much injured by carts and horses going upon them, to take away the cut grass. They cannot, however, do so much injury as a number of horses pasturing upon the field; and by adopting the plan recommended by Mr. Walker of Wooden, that of using broad wheels, (see Ch. 1. Sect. 6. on Roads), the objection is completely obviated.

4. Another objection to soiling is, that in thin dry land, especially in a dry season, it does not produce grass, of weight and quantity sufficient, as to render it worth while to cut it for soiling. The answer to that is obvious, that in such a case the land must be pastured, and that it is im-
possible to make any arrangement that will suit every soil and every season.

5. Another objection is, that it is difficult to know what to do with a large wintering stock, from the middle of April till, some years, the 10th of June; cattle during that period, if living on dry straw, would be so much reduced, as that it would be dangerous to give them any thing like a full supply of new grass, for several weeks; and before the constitutions of the animals have undergone the requisite change, the best part of the feeding season is expired. But there are few farms on which some ruta baga or yellow turnips may not be grown, to a sufficient extent, for supplying an ordinary stock of cattle for six months; but if these do fail, the alternative remains, of pasturing for a week or two a part of the grass land, till the forwardest fields are fit for cutting.

6. Another argument in favour of pasturage, compared to soiling, is, "that though pastures may, for a time, be much "injured by a severe drought, and summer frosts, yet they "recover, whenever the weather becomes favourable; but "a crop for cutting, if injured by drought, at an advanced "stage of its growth, never recovers." And it is said that there is much good turnip soil in Roxburghshire, and in other districts, which, in the ordinary course of seasons, would not produce 50 stones of hay or cut grass equivalent per acre; yet would be excellent pasture, unless in severe, droughts, probably equal to land that would give 150 stones of hay per acre. In such cases, it is contended, that pasturing with cattle or sheep is preferable to soiling.

It may be admitted, that soiling is not a practice that is universally to be adopted, but it can hardly be doubted, that even on turnip soils, every endeavour should be made to soil the work horses; and that though it may be advisable to have a reserve of pasturage, even on clay-land farms,