

straw into chaff, and pulp up about one bushel of mangel per day for each beast, and mix it up with about the same quantity of chaff, having one day's food prepared and mixed beforehand; it heats a little, it softens the chaff, and the beasts are very fond of it, and they generally keep in good health and fatten fast. It behoves us to be careful of our straw. If we have more one season than we require, by all means let us thatch it; I have often found sheep and beasts prefer old straw to new. When I pulped the mangels and mixed them with chaff the beasts ate it better than when given whole.—Mr. Homer quite agreed in giving only a small quantity of chaff, mixed with meal or other food, believing that animals did better with the bulk of the straw; and this was reasonable when they considered the formation of the animals' mouths, which were adapted for masticating their food. He had used a great deal of straw this year, and kept a great quantity of stock, and they had got on very well. He gave his sheep straw in the troughs the early part of the season, and afterwards gave them chaff mixed with other food. Mr. H. Richard had found that animals fed upon cake and straw did remarkably well. The only thing with regard to straw was its harshness, to reduce which he understood that a machine had been invented, and was in use for crushing the straw, and this plan, he believed, would be far better than using chaff, for if straw was cut into such small pieces, it was somewhat difficult for the animal to get hold of them. He had not given straw to sheep, but he knew of one gentleman who gave his sheep straw and hay cut into chaff, with a pint of malt-dust mixed with it, and the animals were in first-rate condition.—Mr. C. Fowler stated that some years ago he had a large field of beans partially blighted, and finding it no good as corn, he got an engine, and had the whole bruised as much as possible. The engine stripped off the leaf and pods, which the animals ate, but would not eat the stalk. He then cut some up as chaff, and mixed it with malt-dust and turnip, and the cattle improved upon it. He was of opinion that the straw was too dry for the animals, and that in bean-hauls there was very little proof. He was of the same opinion as Mr. Ford with respect to the advantage of cutting oats and wheat gay. The reason was that the moisture was retained in it. A short time ago he went to Lord Portman's, where he saw a machine at work bruising gorse. When it came out it was reduced to a pulp, and was in a wet state, and the cattle ate it readily. He believed that gorse would be found a valuable substitute for hay.—Mr. T. Fry said he thought they had trusted too much to the hay crop, and if the corn crops were cut earlier it would be better. Wheat straw, he was of opinion, was not so palatable to animals as oats or barley, because it was too flinty. When he cut his oats this year early his man remonstrated with him, but he told him he was going to adopt Mr. Ford's plan—cut the oats green, and let them stand in aisle some time, and he congratulated himself that by so acting he had a first-rate crop, his oats weighing 9 score 16 nett. He had been feeding his ewes on barley straw at night, and hay in the morning, and was surprised to see how they throve upon it. He gave them as much straw as they could eat. His horses had been eating chaff, and chaff alone, but he had picked up a good idea that evening, and would not continue that plan. The first part of the year he began with oats—six bags of oats mixed with chaff, which the animals did well upon. They then had wheat-straw, but would not eat it, and this was, he believed, because it was too cutting to the mouth. He then returned to oat straw mixed with meal, and from his experience he was perfectly satisfied that farmers would do more with straw as an article of food for their cattle than they ever had; and though he would like to have a nice rick or two of hay just now, he should not in future sacrifice his stock because he had not enough in the spring, but should use straw.—The chairman (Mr.

Galpin) said he had never used straw as food for sheep until he looked over his neighbor's (Mr. Ford's) hedge, and saw that his sheep were eating and improving upon it. He gave his dairy cows and stock cake and straw, and was perfectly satisfied with them. Professor Voelcker some time ago wrote an article in the *Royal Agricultural Journal* on the use of straw for feeding purposes, and the practical experience of all who had spoken that evening fully confirmed his views, viz., that the straw cut green was the most nutritious. He also gave an analysis, which showed that oat-straw was the most nutritious of all straws. The result of the Professor's researches proved that pea-haulm was the most nutritious, oats next, then pea-pods, bean-straw next, wheat the next, and barley straw the lowest.

FARMS AND FARMING IN GREAT BRITAIN.

At a recent meeting of the American Institute Farmers' Club, Dr. J. V. C. Smith stated the results of his observations while in Europe, as follows:—

"As we pass rapidly through the best parts of Ireland the amount of land devoted exclusively to grass is a peculiar feature. The present season the hay crop appeared to me to be remarkably heavy. We rarely see on our best fields such a heavy growth of grass. It may not be so considered by those who manage them, but the thick appearance of the grass, its succulent and tender fibre, gave me an impression that it must be both sweet and very nutritious. The humidity of the climate and a lower temperature than with us must contribute essentially to such properties. Barns are an unknown convenience in Ireland, Scotland, Wales, or England. We rarely see any building for storing hay or protecting stock much larger than a one-story stable of very limited capacity.

"Hay is invariably stacked, each pyramid being thatched, as a general rule, with straw. I was repeatedly assured that when three and four years old such hay is considered infinitely improved and always more valuable, having lost none of its essential elements by long atmospheric exposure. It is carefully cut down perpendicularly and fed out without waste. All fences in the kingdom, with few exceptions, are Hawthorn hedges. Fields are usually small compared with our own, and what is particularly observable, hedges once set are rarely removed, and consequently the form and dimensions of fields remain the same for a long while. It is probable that the length of leases through the more lives conduces to that stability of the hedge render the fence more difficult to pass, while the earth at first thrown out gives elevation to the thick, almost impassable wall.

"Throughout Scotland and England the tillable land is more closely seeded than with us. Instead of hills, potatoes, beets, turnips, and a variety of vegetables are sown in rows very near together. Weeding is admirably conducted. The plants alone are permitted to feed on the soil. As soon as one crop is out of the way another of some sort that may be useful, even late as it may be in the season, for cattle food, is introduced. We cultivate more land ostensibly than is well cared for. They, on the other hand, have less ground under cultivation, but better nurtured, and therefore more profitable. Fertilizers of every possible description are very carefully preserved. We waste, or allow to be wasted, what an English farmer would carefully collect as a precious source of prosperity.

"You see extensive fields of beets in England. They are raised for feeding cattle, and so are turnips—thousands of bushels to our ten. The fact is established that the sugars they contain are superior to many of the grains we deem all important in the production of rich milk, or fat, rich beef. It would be presumptuous in me to suggest they are right and our farmers wrong here in the Middle States, where corn raising is a laborious pursuit, even with shallow ploughing. In cursing over Great Britain we are all struck with the immense culture of trees. They are cash articles, and ever will be for kindling and fires, if no higher purpose were contemplated. We are cutting and hacking them down as though they encumbered the ground. Every range of fence with us, as with them, should be studded with trees. It should be a spring and autumn duty to extend their transplantation. Our farmers ought to have it impressed upon them that such labor would yield a harvest in the future far exceeding their expectations by laborious efforts with uncertain crops, whose value must always vary in volume and value upon the contingencies of the weather. Trees grow tall regardless of seasons. They are a sure crop. Another observable feature in land culture that contrasts strongly with our own, is the general employment of horses instead of oxen. Nor do they use all kinds and breeds for farm work, as we do, without reference to the build, weight, or physical capabilities of the animal. An English

farm horse is a sort of monster for anatomical build and strength. With very large feet, immensely enlarged in appearance, with shaggy hair growing in profusion from their knees to the margin of their hoof, their strength is really prodigious. Of course they rarely move beyond a walk, and are consequently in vigorous health and their powers of endurance unequalled.

IMPROVING THE UNDER-SOIL.

Our land should be mellow under where it comes in contact with the lower roots as well as in the seed bed. The roots want space to luxuriate. We aim at a mellow surface; we should aim at a mellow under soil. This fallow will give us a garden in any soil, thoroughly worked at the proper time; and we see what fallows and gardens and such soils are. The best root crop—a piece of carrots—we ever knew was one where the mellow soil was turned down deep (the plow running to the beam), richness and looseness of soil below for the roots to do their work in. The soil turned down was rich; had received a coat of horse manure, and was well saturated with its substance. It is below where the work goes on—if you let it; otherwise the roots must be confined to the surface, which, in a drought, will be too dry, and will soon have its substance absorbed. A deep, rich under-soil will also keep moisture the longer, hence the soil for a dry time. The air will reach it, which is another benefit; it will plow the better; will measurably drain itself.

By turning down in the fall a rich, mellow clay soil, bringing up the raw harsh ground, by spring there will be a pretty mellow surface. Manure applied, and this harrowed in with the grain, there is a chance for an excellent crop. Corn on such land will do; so will roots; so will clover; and the grasses will flourish exceedingly; they will strike their roots downwards, and the mellow soil (below) will stand in lieu of cultivation, and will retain moisture. For grass it is believed deep cultivation is not necessary—one of the greatest errors in farming. Who ever saw a poor crop of grass on a deep, rich, finely cultivated soil? This never fails where there is plenty of seed used. It is the soil for wheat—this deep, rich, under-cultivated soil—preventing water from standing and scouring the land during the winter, and from heaving in the spring.

We are afraid to turn down our mellow soils, especially to turn it down deep and bring up loose mellow; we prefer to keep it where we can see it, and put our seed in. But it is wrong; turn it down. Then cultivate and press the top soil. Now is a good time to do this, and apply our manure as it is made, spreading it as it is applied. We want some manured soil brought up and worked upon by the elements and manure. The spring will find such a fine mellow bed (with a corresponding soil below) that it will do one good to work it; the evidence of its success is on the face of it. We would not advise the plow to run twelve inches when the land is accumulated to but six; plow eight inches. This will enable the top cultivation to mix some of the old soil with the new, and the manure influencing both.

Thus far we have not used the subsoil plow which, in addition, is a great aid. The lower soil well loosened, it will be benefited for years; and the deepening the culture thereafter may be done with less work, and more profit, as the soil is less raw having been somewhat worked upon by the air and rain water. But never work the subsoil when wet.—*Prairie Farmer.*

SOILING CATTLE.

Mr. George E. Waring, the excellent manager of Ogden Farm, at Newport, R. I., U. S., lays down the following programme for a herd of twelve cows:—

1. Early in the previous autumn, sow three acres of winter rye, to be cut the next spring from May 15 to June 15.
 2. Early in April, sow two acres in oats, to be cut from June 12 to July 1.
 3. Late in April, sow two acres in oats or barley, to be cut from July 1 to July 15.
 4. Early in May, sow two acres of oats or barley, to be cut from July 15 to August 10.
 5. Middle of May sow two acres of oats or barley to be cut from August 19 to Sept. 1.
 6. Middle of June replant plot No. 1 with corn, which is to be cut from September 1 to September 20.
 7. Early in July re-sow plot No. 2 with barley, to be cut from September 29 until roots and cabbages come in, which is usually Oct. 1 to 15.
 8. In September three acres of plots 4 and 5 are to be sown in winter rye for the next spring's use.
- Mr. Waring's experience demonstrates two general principles:—
- 1st. The earliest abundant food will be secured by the use of winter rye.
 - 2nd. The best and most abundant food for the later summer and early autumn time will be secured by the use of Indian corn.
- Joshiah Quincey's method of soiling is as follows:—
1. May 20 to July 1st, feed cut fodder from early clover, rye or orchard grass.

July 1 to 31, cut from oat field which was sown in April.
August 1 to 31, feed sown corn, planted from May 1 every ten days.
September 1 to 30, re-cut the oats on field No. 1; also feed one acre late corn, sown in June, every ten days.
October to November, feed tops of vegetables.

After December to next May, feed hay and roots, mixed and finely cut or cooked. Lucerne is most valuable for soiling. It requires no re-seeding every year. The first year it yields two crops—June and September; in succeeding years it will yield four crops each season—June, July, August and September—about a ton per acre from each mowing. Most of its nourishment comes from the atmosphere; hence it is an enriching crop as a green manure.

The following will be found a good practical schedule for a herd of cows. For green food during summer sow:—

- 1 acre early rye the previous fall.
 - 1 acre early oats.
 - 1 acre sowed corn, May 1; re-sown Aug. 15.
 - 1 acre cabbages.
 - 4 acres lucerne.
 - 2 acres sugar beets and mangels.
- For winter food, cut hay from ten acres of clover or timothy, and roots from three to five acres additional. As the ground becomes more and more rich the feeding capacity of each acre will be increased, and in time doubled so that twenty acres can easily maintain twelve to fifteen head the year round. All the manure made must be returned as a top-dressing.

THOUGHTS ON FOREIGN FARMING.

I know of no more suggestive material for American farming experiments than that afforded by the well digested results of agriculture in England, France, Belgium and Germany. And although the published records of these fail to give the same accurate idea of the *modus operandi* that would be afforded by practical experience, careful reasoning with reference to the peculiarities of tillage in this country would, in some instances, render the data thus obtained of rare and peculiar value. Perhaps an example of this may be found in the difference, advocated by some English writers, to be observed in laying or lapping furrows, according to the kind of crop to be raised or the character of the growth under cultivation. Where grain is to be sown, especially if the land is seeded down to grass, the furrows are laid flat, the edge of one shutting up the edge of contiguous ones; the complete inversion of the soil not only having a smooth or nearly smooth surface, but also effectually lapping all roughness, etc., that grew upon the top. On the other hand, where vegetables are to be grown and a more pulverulent condition of the mold is desired, the furrows are lapped and lie at an angle from vertically; in about forty-five degrees. The former plan, in our comparatively hot, dry climate, will most certainly decompose the vegetable matter in the soil, and should, therefore, be adopted on lands possessed of much organic matter or on those with a heavy shabby or pe. But light soil containing less than, say, five per cent. of humus would profit by a slower decay, and the lapped furrows would be found to be best. One method that abroad gives excellent results is that of lapping in the autumn, one furrow flat on top, of an equal width of land, the stubble, whether of grass or grain, being buried between the two in a state very favorable to decomposition, and also to the early surface drainage of the field in spring. When the "lands" and the furrows are plowed in their turn, a thorough disintegration of the mold is produced. It is laid down as a kind of axiom that the best plowing is done when the depth of the furrow will be one-half of its width; the row turning the mold over in the utilization of which many a field and garden might be made to yield with far greater abundance, is found in the practice of using buried clay for sheep bedding, which, from its absorbent power, saves the liquid manure, constituting thirteen-fourteenths of the whole, which is commonly wasted. The clay is burned to brick dust, of which a wheel-barrow load answers one for twenty sheep. In England twenty-seven bushels burned costs six pence. The manure provided by its use has the peculiarity of being suitable for either light or heavy soils, inasmuch as it increases tenacity and moisture, retaining properties of the former and mechanically lightens and loosens the latter; in either case, contributing, of course, the ammoniacal and other elements of fertility contained in the sheep manure.

While speaking of fertilizers, I may dilate a little upon the chemical experiments that during the past four years have been made with a view of obtaining potash from refractory substances like feldspar. The simple pulverization of feldspar, it is said, brings it to a condition in which its potash will slowly leach out under the action of water in the soil. But the extreme hardness of feldspar too costly for practical application. Recourse has, therefore, been had to the chemical action of lime, which replaces potash in its combinations, and, there-

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STUDY

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