in the fact that there has been an inadequate manuring or that there is a deficiency of some constituent. In this case top-dressing is valuable, of course; I am well aware of the fact that a top-dressing of guano, etc., on wheat is extremely beneficial usually, but I am supposing that "H. M." wishes to confine himself in this connection to the use of lime. As to the use of salt with a barley crop, I should not be inclined to use it at all. Barley should be sown after a heavily manured crop of anything except the other white grains, and farm-dung ought never to be applied directly to it. Barley succeeds best in a warm and dry climate, though gentle rains after sowing are beneficial, and perhaps in a very dry spring a slight sprinkling of salt would be of use in absorbing the moisture of the air. I should apply it when the barley was up. The application of salt to clover, if not injurious, would not be of much value, and if gypsum were applied in its place, the benefits would be more certain as regards the clover, and would be of a little value to the barley, provided, of course, that the soil needs it the first year.

Another query is as to whether it would pay to seed down every field each year. It is extremely difficult to answer this, as I do not know how he is placed as regards a market, and hardly understand what he means. If he means that he intends to take only one cutting of hay from a piece of land, he will pursue an extraordinary course of farming—will have to keep but little stock, or else will have to buy hay and manure; in fact, his question can only be answered with further particulars. Where hay is cheap it would pay to give up its cultivation altogether if a crop can be grown to give a more profitable return, say potatoes, and this could only be done where labor was cheap. However, I do not think it advisable under ordinary circumstances to have expense of seed, labor, etc., annually for a hay crop; it is better to go to a little expense in the matter of top-dressing your meadows when they begin to show a falling off in the return. A four years' rotation will bring them under the plow quite often enough.

In conclusion I would state that, being restricted by the dictum of the Editor of the ADVOCATE to a column and a half, I have not written as fully as I should have liked.

HIRAM B. STEPHENS,
Slocum Lodge, St. Lambert, near Montreal.

No. 2—Reply to Newcastle Letter.

SIR,—In replying to "H. M.'s" letter regarding lime, ashes, salt, etc., I will endeavor to take up each question and opinion in the order in which they are given, or nearly so. Though lime has not been very extensively used in Canada as a fertilizer, yet in older countries it has been in common use for many generations, attended with beneficial and general marked results. It is only a few years since, comparatively speaking, that farmers in this country, and even yet in the older sections only, have come to the conclusion that something more than barnyard manure is necessary to maintain the natural fertility and productiveness of the soil. Lime is an essential element in the food of plants, being invariably found in their ashes, varying from 2½ per cent. in the grain of barley and Indian corn, 3 per cent. in wheat, rye and oats, to nearly 6 per cent. in peas and beans. A larger amount is found in the straw of those plants—the ash of wheat straw containing 6 per cent., while that of pea straw yields as much as 38 per cent. In root crops, the amount of lime is still greater; the ash of turnips containing 12 per cent., and that of the tops, 35 per cent. It is a singular fact, that although in nearly all soils lime exists in sufficient quantity to meet this demand, yet very marked results attend the application of caustic or slacked lime. This is owing to the burned lime acting upon the organic matter in the soil, hastening its decomposition, and making it available for plant food, and also because of its mechanical action. It has the property of rendering clay land more light, open and porous, which is a great advantage. On light, sandy soils it has the opposite effect, leaving them more compact. To get the best results, lime should be applied to the surface, because of its tendency to sink into the ground, harrowed well to mix it with the soil, and that immediately before the sowing of the grain. Unslacked lime would sooner bring about the changes which have been mentioned, but because of its being impossible to distribute it evenly, it is better to slack it with water, thereby having it more caustic than if air slacked.

Undoubtedly, ten bushels per acre would be better than none; and even that small quantity might cause a fair increase in the first crop, but its effect would not be noticed in the succeeding crops, except on soils which are naturally deficient of lime and abound with all the other necessary elements of plant food. On such soils as these, a light dressing of lime would probably give a marked increase for a number of years, and that because it supplies directly the missing constituent of plant food. It is, therefore, advisable to follow the practice of British agriculturists, who apply from 60 to 150 bushels once in five or six years, according to their shift, or system of farming.

As H. M.'s farm consists of clay and clay loam, he may rely upon receiving a good return from heavy liming, without much danger of being disappointed. Prof. Johnson, in an article contributed to the first number of Hearth and Home, says:—"Lime has long been known as a substitute for drainage. Even level lying clays have been made friable and dry by heavy liming. In the Ober-Lansitr (Germany), and in the north of England and Scotland, this effect has been abundantly seen. Lord Kames noticed, seventy years ago, that some soils are rendered so loose by overdoses of lime as to retain no water."

Continued applications of lime must be made with care. There is a saying among English farmers as follows:—

"He who limes without manure,
Will leave his farm and family poor."

The reason of this is, that lime acting upon the organic parts of the soil, fitting them for plant food, causes it to produce larger crops for a time, and just in the same proportion as the crops are increased, so will the organic matter decrease; that is, the soil is being exhausted. The careful farmer can prevent this by manuring with barnyard manure and ploughing down green crops, thereby returning to the ground those elements drawn from it by the increased crops, which the lime from its stimulating nature has caused it to yield.

Regarding the mixing of salt, ashes and lime, no harm can result from doing so, if they are applied at once; but if allowed to remain mixed, chemical changes are apt to take place which may partly prevent the good results looked for.

The use of ashes will, in some cases, give a better return than lime, viz.: on soils lacking in potash and containing lime in abundance. Again, many maintain that salt is a cheaper and better fertilizer than either ashes or lime.

It would be better for H. M. and others to experiment with these separately and also mixed, and ascertain which is the most beneficial for them to use on their respective farms. In all cases they should be scattered on the ground before sowing the grain.

There is no danger whatever of the yonng clover plant being injured by salt, but has just the opposite effect. Very often we find clover, after making a good start in the spring, withers and dies during a summer drought. This can be prevented by sowing salt, as already stated, at the rate of 150 lbs. per acre, and after the plants are well up, sowing land plaster at the same rate. The plaster causes a rapid growth during the moist spring, and the salted earth retains the moisture, thereby insuring nearly certain success in getting a good set of clover, providing the land is in good condition.

It is very difficult to reply satisfactorily to the last query, seasons, conditions of soil, and prices of seed, being so variable. It certainly would not pay to sow seed when worth $8 per bushel, on low, rich land, during a moist spring, as the clover would likely grow so rapid as to choke the grain, greatly lessening the yield. All the benefit resulting from it would be the fall pasture, as the land would not need it for manure, being already rich in vegetable matter. Neither would it pay to seed down uplands which would be ploughed immediately after harvest. With high lands, that are to remain unploughed untill late in the fall, the case is different. It is an advantage to have those seeded, not only for the fall run of pasture they afford, but also that the clover roots manure the soil in some measure.

J. C., jr., Woodville P. O., Ont.

Mr. Purdy, N. Y., calls attention to the fact that soil and location had much to do with the desirability of all strawberries. On his land he found delicious fruit where tree leaves fall in autumn, but on the same patch not enriched the berries were unfit to eat.

Condition of Dairy Stock.

In determining the proper condition of dairy stock, it will be necessary to give special attention to three particulars:—

1. The yield of milk.
2. The general health of the animal.
3. The economic or paying element.

If a system should be devised that would promote an excessive flow of milk, but in its general effect weaken the animal or break down her constitution, such a system would have to be condemned, for the milk would not be healthy, and the system would, by inducing diseases among cattle, run itself out. Is this not already true of the excessive use of slops and watery roots? Too much green or laxative food, in cold weather particularly, would be dangerous to the health of the cow.

The conscienceless milkman might secure a large yield of milk of poor quality, indicating a low state of health, and he might claim that he could get no more for a good article, thus by his covetousness endangering both the health of his animals and that of his customers and their families. To such this article would have no weight, but to the honest dairyman it has force. Let him but persevere in making good goods from healthy animals, even if it be at a present pecuniary sacrifice, and in the end he will be the winner, for in the long run he will aggregate more milk, and his customers will, in due time, consent to an advance in price on the ground of quality.

Within the latitude and longitude, so to speak, of the three points laid down, the dairyman should have his choice as to circumstances. If cornmeal is cheap, and he prefers it to hay, then let him use it, if it harmonizes with the other conditions. On the other hand, the one who has more hay can make that his base. The dairyman near a mill can use his ground feed, while some may be so situated as to find it necessary to use whole grain. When oats are plenty and cheap, they can be chosen at the option of the feeder. The point insisted on is that the dairyman, whether he be giving tests or not, shall be entitled to feed the best he knows how within the limits mentioned, and give his methods to the public for comparison and general information. The practical outcome of this investigation will be to determine with reasonable accuracy the best kinds of dairy food, and the quantities to be used.

What is the best condition of the average dairy cow? She should be fleshy, but not quite up to the highest butchers' standard. The reasons are:

1. In that condition, as a rule, she will give the maximum yield of milk.
2. The milk will be of superior quality.
3. The animal will be strong and more likely to withstand disease, and be a good breeder.
4. After once reaching that condition she is more easily kept.
5. She will always be so nearly ready for the butcher, that little or no loss will be caused by disposing of her.
6. She will be more quiet.
7. It is more satisfactory to handle cattle in that condition.

Every animal requires a certain amount of feed to sustain life. On this amount the feeder can make no profit. Add to this amount and we have growth, milk or meat in return. The quicker we add and receive the profit of the added feed, the less time we are obliged to deal out the non-paying feed. There is enough wasted each year in this country by slow feed to afford a magnificent profit, if properly used. This is true in regard to pork as well as milk. It is like running an engine with lukewarm steam; it is like the merchant who sells only enough goods to give him a bare existence, when with an increased sale he could get ahead.—[American Dairyman.

SULPHUR FOR SHEEP.—An exchange says: Mix a little sulphur with salt, and feed occasionally to sheep. It will effectualiy cure sheep of all ticks. The same remedy applied to cattle troubled with lice will soon rid them of the vermin. The use of sulphur with salt well repays the trouble of keeping a supply for cattle and sheep. If a mixture of one part of sulphur with seven of salt be freely supplied there will be no trouble with vermin. You can give horses the mixture with good effect.