

tutored in the school of discipline. She was deeply afflicted, but she held her peace. A meek fellow-sufferer, she applied herself at once to sustain as a daughter, and to soothe as a sister, except when the flood swelled so high that it would not be restrained, and she fled to solitude, to cast her care on Him who cared for her."

"This affliction sets in relief some features that might otherwise not appear, and we certainly are drawn toward the subject with livelier interest when we discover this meek submission under a heavy blow, and a cordial confidence in Him who had ordered the trial. Thus sorrow renders loveliness more lovely."

"As darkness shows us worlds of light
We never saw by day."

After the death of her father the family is broken up, and Mary goes to Edinburgh among dear friends, and in the cultivated society of that classic city, and in the midst of its many sources of high intellectual improvement, she devoted herself to the acquisition of knowledge. Her opportunities were great, her talents rare, her thirst for knowledge ardent, and her improvements such as might be expected. Yet in the absorbing pursuits of knowledge into which she entered with so much ardor, the thoughts of her departed father often came with subduing power, and the affliction seems to have been permanently sanctified to her soul. Nearly a year after his death she writes:

"Has thus affliction given me an abiding sense of the instability of earthly joys, and made me long more for that purer delight, which is found in seeing the Lord face to face! Has it made me walk more circumspectly, and devote myself more completely to my God? Has it made me feel the value of that blood, which has washed away sin, and taken the sting from death! O, I thought at first that I could never make this world my home, nor forget how fast it must fade from my view; but sometimes I have forgotten this. How lovely heaven would appear, did I always think of it as my resting-place, and employ my thoughts on what would prepare me for going there!"

Again she writes in allusion to her father's death:

"Dear mama has lost what she cannot regain, and no wonder she feels sad; and when she looks at me she feels sadder still.—Yet surely, I, loving her as I do, better than anything in this world, ought to be a comfort and a help to her, and wish to be so. O God, I am ignorant; wilt thou make me holy? and let me walk softly, lest I lose the little spark of grace I trust thou kindled in me. I want to learn prompt obedience. When I was a little child, I never thought I knew as well as mama; but now I at times feel inclined to take my own way. Why should I be so proud? Let me learn humility; this is my best wisdom. How unlike the children of heaven are the thoughts that fill my heart! I want to glow with love to all, so that I shall forget myself, and be happy if I can, in any degree, make them so."

Her fondness for the beauty of nature has been mentioned.—"Last night," she writes, "we went to the high part of the road to see the English coast, which was sparkling in sunshine, while passing clouds cast deep shadows on parts of it. The cliffs stood out in beautiful relief, and the summit of Helvellyn appeared at a distance beyond Skiddaw. It was a scene never to be forgotten, and excites a longing to be a hermit on the side of one of those beautiful hills. But storm and mist shroud them sometimes and they are not often so lovely as they then were. Let them act on me as a similar scene did on James Montgomery, 'yonder summits far away,' &c., and 'beyond the tomb,' let me look for perfect peace."

AGRICULTURE.

THE REARING AND KEEPING OF STOCK.

From Professor Johnston's Lectures on Agricultural Chemistry.

1. *Keeping Stock for Manures.*—In Lincolnshire, the farmers keep stock for the manure which they supply. Raising corn crops is their first object, and they only keep stock to supply manure for these crops. They don't want to fatten their stock, and as the proportion of manure is dependent on the quantity of food eaten, it becomes evident that they should do precisely the reverse of what they should do if they wanted them to eat little food—that is instead of shutting them up in dark sheds, they should expose them in the open air, and give them as much exercise as

possible. In some cases a man is kept to exercise them regularly. Another thing that they should attend to is, to keep large animals, as they eat more than small animals, and hence give more manure.

2. *Fattening Stock.*—Suppose you wish to make your animals large and fat, you ought to give them some kind of food which contains a larger proportion of fatty matter than that on which the animal has been accustomed to live. Hence it is that in this case oil-cake is used, and thus oil-cake becomes valuable precisely in proportion to the quantity of oil it contains. What is a very important circumstance is, that there is more oil in the husk of grain than in the grain itself. Hence the surprising properties of bran in fattening animals, a circumstance that seems almost inexplicable to the practical man. The following is the Composition of Bran:

COMPOSITION OF BRAN.

| | | | | | |
|----------------|---|---|---|---|------|
| Water, | - | - | - | - | 13.1 |
| Gluten, | - | - | - | - | 19.3 |
| Oil, | - | - | - | - | 4.7 |
| Little Starch, | - | - | - | - | 55.6 |
| Saline Matter, | - | - | - | - | 7.3 |

100 lbs.

From this table you will see that Bran contains 5 per cent of oil; whilst wheat itself contains only from 2 to 4 per cent. This, then, is the secret of its fattening properties; and the same thing is applicable to most plants, namely, that the husk contains the greater proportion of oily substance—its purpose being to preserve the grain from the decay and other hurtful consequences that would ensue, if water were allowed to penetrate. Amongst the other kinds of grain, Indian corn has a large quantity of oil. In this country we don't grow this kind of grain; but in the United States, where its cultivation is very general, it is largely used for fattening animals. Oil cakes differ from each other, in the proportions in which oil is present, and you will see presently how the several kinds of oil-cake are applicable to various purposes.

3. *Young Stock.*—In rearing young stock a new kind of treatment comes into operation. The whole parts of the body require to be fed—not only the fat, but also the bone and muscle. Substances containing starch and oil will enable the animal to increase in muscle and fat; but they will not do for the bones. Hence, phosphates must be supplied in large quantities. If you feed your stock on sago, which contains scarcely anything else than starch, you do not give the animal the article necessary for muscle and bone. It is just the same thing when you give a child arrow-root alone—you cannot expect that it will increase in bone and muscle on such diet. A calf, in addition to sustaining food, requires an ample supply of all those substances necessary to its growth; and it is just in proportion to the quantities of these substances which a particular kind of food contains, that it is useful or otherwise. If you give it oil-cake, then oil-cake must contain all those substances. Now, among the various kinds of oil-cake there is a great difference in the proportion in which phosphates are present. Some have more phosphates—others less; and you saw a few minutes ago that one kind of oil-cake had more fatty matter than another. Thus you see the oil-cakes are of different value, according to the purpose to which they are devoted. One kind is of especial use in fattening cattle, another in feeding young stock.

There are one or two things, which puzzle the practical man that become apparent when viewed in the light of what has been brought out just now. You know that there are some old pasture lands which have gone on from time immemorial, without any manure being added to them. The farmers tell you that they have never known these lands to have been richer or more valuable than they are now, hence the practical man concludes that the addition of manure is unnecessary if the produce be eaten off by stock—that the droppings of the animals that are fed on the land are quite sufficient to maintain its fertility. But the reason of this continued richness of old pasture lands is chiefly this—that the animals when placed on them are full grown—they have already obtained their full supply of bone and muscle. They thus take from the land only the fat, returning to the soil the phosphates, saline substances, &c. The waste in their bodies requires, it is true, portions of these substances; but then this waste is returned in their manure to the soil, so that they give an equivalent for what they take from it. Thus fat is the only substance taken from the soil; and as this fat is drawn by the grass from the atmosphere, it is very clear why pastures get no poorer.