

of diseased ones which our shambles are constantly exhibiting? showing the great inattention the farmer pays to the comfort and well being of his cattle. Fat is a reservoir of carbon for the system to draw upon for the purposes of combustion, in the event of the food not containing a sufficient quantity of the proper elements to keep up animal heat. As manure is an important result attending the feeding of animals, it may be well to remark that its quantity depends upon the refuse of food, and the amount of absorption going on in an animal's body, or in other words, upon its own destruction, thus returning to inorganic nature, as food for vegetable life, the elements of its own destruction. But the quality depends upon the quantity of nutritious food given to the animal. The young growing animal requiring increase as well as sustenance, consumes all the nitrogen and fatty matter in its food. The milking cow the same. But in fullgrown feeding animals a large quantity of these ingredients are not consumed; a rich and valuable manure is the result. In choosing animals for feeding purposes, the farmer often exhibits a remarkable knowledge of physiognomy. He likes a kindly disposed, quiet looking animal, with symmetry of carcass; one built for strength, broad across the back and loins, and long quarters, where large masses of muscles are placed, a narrow and deep chest, and "a good handler," or where there is a large quantity of fine soft hair, with plenty of fatty matter underneath to nourish it. Thus furnished, he has only to put into operation the suggestions of science, and the result must necessarily be profitable and useful. When we see the extensive application of capital, industry, and science to the manufactures of this country, and the comfort and wealth they produce to thousands of our fellow creatures, also the dominant influence of its interests, threatening the downfall of the British farmer, surely it is time, and our bounden duty, to unite these same principles, that the abundance of the soil may satisfy both landlord and tenant, and be the means, under the blessing of Divine Providence, of producing plenty of cheap food to the many thousands of our wanting fellow-creatures.

The Chairman proposed the health of Messrs. Smith and Wood.

Mr. Smith replied, and expressed his gratitude to Mr. Wood, for his elaborate exposition of the subject, and still hoped to see science and practice combined much more than he had done.

Mr. Wood proposed the health of the Chairman, which was received with loud cheers.

The Chairman rose and expressed his gratitude for the kindly manner in which they had drunk his health. He would have gone further into the subject before them, had it not been so ably treated by gentlemen of practical science. It was from practical men they must expect useful information; and when they had practical men for their leaders, it was their own fault if they did not benefit by them. He bore testimony to some of the principles laid down by the previous speakers, and said he should feel pleasure in presiding at their meetings. Again thanking them for the honour done him, he resumed his seat amidst applause.

Mr. Bernays again rose and said—In order to obtain a fair proportion of fat and lean, it is of the utmost importance that you should be acquainted with the composition of food. We should be very much mistaken were we to judge of the value of food by its bulk. Greentop turnips, mangold wurzel, and red beet, contain 89 per cent. of water; Swedes, 85 per cent.; potatoes, 72 per cent.; oats and wheat straw, 18 per cent.; hay, peas, and lentils, 16 per cent.; and beans, only 14 per cent. Hence the latter food is infinitely superior as to its feeding properties than the former. But we have only spoken of the food in relation to water; it is necessary that we should understand each other when we make use of certain terms. It is but too indefinite if we include fleshing and fattening in the term *fattening*; the term rearing would then be more appropriate. But it would be still better if we distinguish between *fleshing*, or the formation of muscle, and *fattening*, or the formation of

fat. According to the quantity of non-nitrogenized constituents of food capable of forming fat, in other words, according to the supposed fattening properties of food, they rank thus:—1, Oats, barley meal, and hay; 2, beans and peas; 3, lentils; 4, potatoes; 5, turnips and red beet. According to their fleshening properties, they stand thus:—1, lentils; 2, beans; 3, peas; 4, flesh; 5, barley meal; 6, oats; 7, hay; 8, carrots and potatoes; 9, red beet; 10, turnips; 100lbs. of lentils are supposed to be capable of yielding 33 times as much muscle as 100lbs. of turnips. Great advantage therefore results from the admixture of food. An animal which has been fed chiefly on oil cake, would, on being turned out, increase in size much more slowly than the animal which has been fed on hay, or on turnips and hay. The oil cake produces chiefly fat, and little flesh; hence the movement of the animal will consume much of the ready formed fat, or tallow. It is only when the oil cake is given with fleshening food—such as beans, oats, and hay—that lean is proportionally formed. Warmth, confinement, and fattening food are most favourable for the formation of butter, fat, and tallow. Herbage—which is generally denominated poor, but which, in reality, is rich in nitrogenized constituents, and which cows have to crop themselves—is favourable to the formation of cheese, but not of butter.

Mr. Stokes.—Would you recommend the food to be given in a warm state?

Mr. Bernays.—Decidedly; a little lower than the temperature of their own bodies.

Mr. Stokes proposed the health of Mr. Burrows, and the Stewards.

Mr. B. returned thanks, and said he had been much pleased with the discussion that afternoon. He was sorry that more practical men had not risen to take part in it. He had found by experience, that cattle kept dry and warm, consumed less, and fattened better.

Mr. Henson rose, and asked what mixture of food Mr. Bernays would recommend. He was at a loss to know how to put these different elements together. He hoped to hear at some future discussion how to produce the largest amount of fat, without losing sight of the manure heap. He proposed the health of the Rev. E. Wilson; who rose and returned thanks, and expressed his gratification with the discussion. He always found instruction at their meetings.

Mr. Stokes suggested that tables of the quantity and quality of food recommended, should be drawn out, and some of the members requested to keep an ox or two, and give the result of their experiment for the benefit of others.

Mr. Henson made another observation or two relative to the quantities of food and the manure heap, and

Mr. Bernays rose and said—I can only say, in answer to Mr. Henson, that I shall be happy to answer his questions as to the necessary qualities of food for producing flesh and fat, on some future occasion.

POTATO DISEASE.

To the Editor of the Durham Advertiser.

SIR,—The investigation of the potato disease having been taken up on a large scale, I have been requested to undertake the chemical part of that investigation. I have in consequence drawn up the following queries for the purpose of obtaining information. They have already been widely diffused in the form of a circular, I hope you will have no objections to give them a still wider circulation through the columns of your journal, and you will oblige, Sir, yours truly,

JAS. F. W. JOHNSTON.

Durham, Oct. 27.

QUERIES REGARDING THE POTATO DISEASE.

1. To what extent has the potato disease appeared in your district, or county, during the present year? Is the general crop large? and how much of it do you think is affected?

2. Is it more extensive during the present than during the past year?