Rearing of Stock.

PROFESSOR JOHNSTON'S LECTURE AT AYR.

Subject—Feeding of Stock.—Professor Johnston commenced his lecture by referring to the composition of the vegetable food of man; in elucidation of which he directed attention to several tables, showing the composition of the different kinds of grain. He next came to consider the composition of the animals that lived upon this food. If they took a portion of any animal—for instance a piece of mutton—and burned it in the fire, they would find that there would be a small part that would not burn away. Thus they would perceive there was a striking similarity established between the animal, the plant, and the soil—that which burned away being called the organic part, and that which did not burn away, the inorganic part. The organic part of the animal, consisted of two different substances—the fat and the muscle. If, after separating the muscle from the fat and the bone, they were to take and wash it in water, as they had seen done in his first lecture with the flour, they would find that the water would gradually become less coloured, and the lean muscle would become white. This mass, with the exception of a little fat—which they could not separate by washing—consisted of a substance to which chemists gave the name of fibrin. Chemically speaking, it was just the same thing as the gluten which they obtained from the flour. Then they had the fat, which formed a covering to certain parts of the body—sometimes interlarding itself among the muscles, separating them one from the other. This fatty matter was nearly identical with that found in all the plants which they raised, in which it was present to a greater or lesser extent. There was also bone in the animal; which, if they burned, a large proportion would consume away, but a still larger proportion would remain. In bone they had a substance called cartilage. In cartilage they had nitrogen present. The fibrin and the cartilage were very like each other in their composition. So much with regard to the organic part of the animal; and if a similarity existed between the general composition of the plant and the animal, they would learn by-and-by, that there was as great an analogy between the inorganic part of the plant and that of the animal. Of what did the inorganic part of an animal consist? The proportion of the inorganic matter varied with the part of the animal as it varied with the part of the plant. If they looked to the composition of muscle, they would find it to be as follows, in every 100 lbs.—

Water, - - - -	77 lbs.
Fibrin, with a little fat, -	22
Phosphate of Lime, - -	—½
Other Saline Matter, - -	—½

And, again, if they looked to the composition of Ox bones, they would find it to be as under:—

Cartilage, - - - -	33.3
Phosphate of Lime, - -	57.4
—— Magnesia, -	2.0
Carbonate of Lime, - -	5.9
Soda, with a little Common Salt,	3.4

As in the composition of the inorganic part of the plant, they had seen that it consisted of two general substances, the saline substances and the phosphates, so was it in the animal—the phosphate of lime forming nearly sixty per centage of the whole But, besides the solid part of the animal, it had in its body certain fluid parts. The blood was the most important of these fluids. It was almost identical, in its general composition, with the muscular parts of the body; 100 lbs of blood being nearly the same as 100 lbs of muscle. They saw, therefore, that the whole animal consisted essentially, in its organic part, of fat and fibrin, and in its organic part, of saline substances and phosphates. The plant consisted of starch, gluten and fat. The animal consisted of gluten and fat, but no starch. He came now to a most important point There was a difference—and a very important one—between the animal and the plant. The animal contained fat and gluten. The plant contained fat, starch, and gluten There was no starch in the animal. It must, however, since it existed in such quantity in the food of animals, serve some purpose in the animal creation. In order to understand this, it would be necessary to explain the functions of the animal economy. The first fact he would notice was, that they all breathed. They inhaled into the lungs a differently constituted air from what they gave out. Only a small quantity of carbonic acid was inhaled by the lungs, but a very large portion was exhaled. A very small quantity of this gas was in the atmosphere, as he had already shown them—only one gallon of it to 2500 gallons of the common air. He likewise demonstrated to them that this carbonic acid was formed of carbon and oxygen. They had seen farther that 36 pounds of carbon, and 45 pounds of water,