and hind quarters. This vein, when large, certainly indicates a strongly developed vascular system, which is favourable to secretion generally, and no doubt that of the milk among the rest." So my memory was not very false to me, after all.

ARTHUR R. JENNER FUST.

Economical production of meat.

A LECTURE on this subject has been delivered by Professor Tanner, of South Kensington, Mr. John Hill, of Felhampton, in the chair. The PRESIDENT explained that Professor Tanner had to leave by the mail train, and there was not a minute to spare. Professor Tanner was well known to all of them by name, and to most of them personally. He had been a real good friend to that Society so long as he had known anything at all about it. He had helped them before by giving them some very able and interesting lectures, and he had also helped that Society indirectly by helping him with some experiments on root crops, the details of which he had laid before the Society the year before last.

Professor TANNER said: The economical production of meat must be regarded as a manufacture. The agency we employ is the living machine—the live stock of our farms. Now you can readily understand, whatever may be the product aimed at, if we have to employ a machine, it is quite possible to have either a good or a bad machine, and such we find to be just the case with animal life—it is possible to have a good machine for accomplishing the work or the converse. An old-fashioned machine, placed by the side of one of more recent date and more improved construction, will do very different work, the one from the other. You can do more rapid work, and you can also do your work more perfectly. If the machinery be imperfect, much of the grain will pass through the machine and be carried on in the straw, not being completely and satisfactorily severed from the straw. Thus, you see, you have a waste of the material which is at your disposal. But however good the threshing machine may be, it is simply impossible to obtain a good sample of wheat from it unless it be first of all passed into the machine, and so we find that there is a certain similarity of result; so that when we have to work by the aid of animal life, the living machine, we want a machine which shall be capable of doing good work, avoiding waste, and so making the best use, and showing the best results, for the food which may be used. The first aim of every farmer is to produce the largest quantity of vegetable food, consistent with the quality being of a proper character, and in the next place he seeks to utilise that food by the aid of animal life. We find that the old breeds of cattle, the unimproved breeds, differed very materially from those of more recent date. The differences to be observed in the local breeds, which were existing in different parts of this country forty or fifty years ago, were largely traceable to the local influences of soil and of climate. Since then we have adopted improved and more valuable breeds, and they have succeeded just in proportion as they have been introduced into districts that suit their peculiarities of character. The old system of allowing cattle to remain until they were 4, 5, or 6 years old, before they were completed for the butcher, gradually gave place to a much more rapid habit of growth, a growth which was more prompt and speedy throughout its entire range, and the result was that the animal was finished and ready for the butcher at a much earlier date. Now that was not accomplished by simply giving the animal more food. It was accomplished by careful observation on the part of breeders, and more careful management on their part, entirely modifying the character of the animals they were dealing with. The tendency of late years has, therefore, been in the direction of so altering the character of the animals we breed that they become quiet and docile, quite disposed to take their food without restlessness, and also able to make good use of the food which is supplied to them.

DIGESTION.—The diminution in the size of the lungs increases the formation of fat. Fat corresponds very closely with the fuel which would be burnt in a fire, and if we have a large fireplace and a small one side by side, the one will burn a much larger quantity of coal or wood than the other. If you put into a room a small fireplace, you must not expect that the warmth from it would be equal to that from a fireplace of double the size—it is only reasonable that we should expect a difference in the quantity of heat which is produced. Now this bears upon the case in this way—that if you breed cattle so that they have small, feeble, or imperfect lungs, you must not expose such cattle to rough, cold weather with the same impunity that you might if they had larger lungs and were fully capable of maintaining the warmth of the body. If you give them small lungs they become unable to maintain that warmth under conditions of considerable difficulty, and having reduced the power of the lungs, if you do expose it to inclement weather, it is said at once of the animal that it is too delicate, and why? Because you have reduced the lungs so greatly that the animal cannot keep up its warmth. Our Shorthorn cattle are notoriously more delicate than your Herefords. The latter have been bred and brought up under conditions which allowed them greater freedom, which permitted them to take more exercise, and so they are more hardy.

Let us look at some of the indications which we find of the differences between those animals that are good producers of meat and those that are bad. One of the most ordinary tests of meat-producing power is that delicacy of touch with which you are all familiar. Now what is the difference between these two classes of animals? In the one case, where the flesh is easily raised, there has been formed beneath the skin fatty tissue, which is prepared for being filled with fat. As you know, the fat existing in the animal body does not exist there in a solid form. It is held within certain fatty cells, and it is only when the temperature falls that this fatty tissue takes a solid form. Hence it is that before you can accumulate fat upon the body, you must have the fat cells in which it can be stored up. In the case of those animals which have loose skins and a good touch, you have these fatty cells already prepared, and the fact of their being so prepared is an indication of the animal to produce fat, which will be followed out more perfectly afterwards. This is a matter of character which it is quite possible to produce by breeding but it is also largely dependent upon the supply of food that may be given. For instance, however well-bred an animal may be, if it has to grapple with a deficiency of the food supply, this fatty tissue is soon taken up and the animal becomes hide-bound by reason of the deficiency of fat-producing food, so that if you give to an animal an abundance of fat-producing food, and it is a restive, active specimen of its breed, there is very little advantage, for it is all breathed off in the lungs, but if you give an animal a tendency to produce fat, and you follow that up by the use of suitable food so that the fat cells shall be formed first and then that they shall be filled—in that way you best prepare an animal for the production of fat.

Now, one other point of difference which we especially observe in the Hereford cattle is the quality of the meat produced, because after all it is not simply a question of fat—that is only a part of the meat; the production of the lean meat is a matter of immense moment. But when we come to speak of the production of the lean meat, the flesh, the growth of the muscle, we have then to deal with an entirely different set of circumstances from those that arise when we are dealing with the accumulation of fat. If you want mus-