livered some lectures since last fall in Westmoreland as to butter making. The Government of Nova Scotia are considering the desirability of republishing a work which W. H. Lynch wrote for the Quebec Government on dairies and butter making, and which was issued in the form of a blue book. Directly the work was published, copies of it were eagerly sought for by the farmers of Quebec, and the edition is now exhausted.

W. H. Lynch yesterday had an interview with Hon. A. G. Blair and other members of our Government who, it is understood, are also considering the advisability of republishing his work, so as to enable the farmers of this Province to obtain some practical information on this important subject.

The untensils used by W. H. Lynch are very simple and the *The National Live Stock Journal* of Chicago, in its April number, thus describes them:—

"The set consists of a covered milk-pail set in a frame attached to a stool, with a strainer attached, through which the milk must pass to enter the pail—an admirable device to secure clean milking; next a cooler pail for setting milk—has double sides arranged for cooling with water, ice or air, with a new and convenient device for skimming and handling the skim-milk; a cream pail, fitted for airing, cooling or heating and stirring the cream; a churn of the most approved pattern, a butter-bowl, butter-worker, ladle and balance for weighing salt and butter; and finally, a perfect butter-tub, free from soakage and effect upon the butter, a non-conducter of heat and air-tight. Every item is plain and simple, and consequently cheap and durable. The whole thing is a common sense arrangement devised for improving private dairies by reducing labor, improving quality by the use of better apparatus, by making mechanical appliances to a larger extent take the place of skill, and by similarity in modes of operating, to secure a greater uniformity in dairy butter."—*St. John, (N. B.) Telegraph.*

ENSILAGE.

By Sir J. B. Lawes, Bart., Ll.D., F.R.S.

[In Agricultural Gazette.]

Before I go into the question of the relative value of ensilage, as compared with other succulent foods, I think it will lead to a better understanding of the subject, later on, if I commence by making a few remarks upon foods generally.

I do not propose to treat the matter with scientific accuracy, but to speak in such general terms as may be understood by any practical farmer, who wishes to know some of the arguments which may be brought forward in favour of, or against, this new system of preserving green crops.

The most valuable ingredients contained in the foods we grow are oil, sugar and starch, and digestible cellulose. None of these compounds contain nitrogen. Those which do contain that substance are albumin, legumin, and amides. As soon as we know the amount of these substances contained in any food, it is easy to make a rough estimate of its feeding value; just as we can roughly value a manure, when we know how much ammonia, potash, and phosphoric acid it contains.

In the crops we grow, oil is found in such small quantities that it may be passed over, and I will proceed to the consideration of sugar and starch.

It is now many years since we established the fact—by experiments upon pigs that starch and sugar were of equal value as foods. A pig fed upon barleymeal will increase at the rate of 1 lb. to each 5 lbs. meal consumed; and by far the largest part of barleymeal consists of starch. Barley meal contains about 2 per cent. of nitrogen, while lentils and beans contain more than twice that amount. Our experiments at Rothamsted at the same time showed that while very little, if any, more increase in the live weight of the pig, was obtained by the substitution of a given weight of these highly nitrogenous foods for barley, the quality of the pork was materially injured.

Just as a substance of the composition of barley may be considered the type of a proper food for a fattening pig; so, the grass growing in a permanent pasture of high quality may be considered the type of the proper food for a fattening ox, or sheep.

Some time ago we had under examination a first class pasture in Leicestershire, which was competent—without the addition of any artificial food—to fatten more than one large bullock per acre. We found the herbage was of a very simple character, consisting largely of white clover and perennial ryegrass. As cropped by the bullock it was somewhat higher in nitrogen than barley meal: this would be due to the large amount of white clover.

If we attempt to fatten a bullock upon inferior pasture, we find that the animal will not put on meat, even if it is the sole occupant of an area of several acres. This is caused by the amount of indigestible substance in the poor pasture being so large that the bullock is unable to pass a sufficient amount of grass through its stomach, to supply the waste of its body, and also to produce rapid increase. But by giving the animal daily some rich concentrated food as cake or corn we make up the deficiency of the poor pasture by a supply of starch, and fat. If the dung voided for one day by the bullocks in the two fields were weighed, the much larger weight that would be found in the field occupied by the animal feeding on the poor pasture, would show the large amount of indigestible substance which the grass contained.

I now come to cellulose, which chemists divide into digestible, and indigestible, and some important experiments have been carried out in Germany to show how much of these substances are digested.

Although such experiments are very valuable—as establishing the fact that some substances are more digestible than others—still it is impossible to draw a hard and fast line between the two: and it is further probable that the stomach of an animal short of food would digest much matter which a well-fed animal would avoid.

The deterioration of the feeding properties of our crops by the formation of woody fibre, is well seen where sheep are fed upon rye. As soon as the stem begins to form, an unerring instinct tells the sheep that something has been produced which is not food. The manure ingredients which might have been employed in the production of starch, sugar, or some other feeding substances, have been in fact doing unprofitable work by the production of woody matter.

On one of our experimental fields at Rothamsted, the same artificial manure has been applied for a long period to land under (1) permanent pasture; (2), continuous wheat; (3), continuous roots. The average produce under the same manure has been as follows—

Wheat, 32 bushels; 3696 lbs. straw.
Hay, 2 tons 11 cwt.
Mangels, 18 tons bulbs, 2½ tons leaf.

The absolute amount of dry produce in these three crops is not very different; but there is a very large difference between the amount of indigestible food contained in each. In the wheat crop we have more than 1½ ton of straw, containing a large amount of woodly matter: while in the mangels the woody matter is very small.

In the silos certain valuable food compounds are destroyed, it is however asserted that much of the woody indigestible matter has been converted into digestible food. An investigation in regard to the truth of this statement is I need hardly say of great importance.

Thirty-two bushels of wheat even at 5*s.* per bushel are worth £8, and the starch which forms the bulk of the grain would—if the crop were cut green—add largely to the feeding properties of the straw. It is by no means clear however that, as ensilage, as large a money return could be obtained, as by the sale of the wheat, and feeding the straw with a root crop.