in the soil, such supply may be made very valuable to the farmer, since with the aid of clover he can get good crops of fodder and of grain out of the soil. Nature, moreover, seems to provide ways for increasing this stock of tough nitrogen food from the free nitrogen of the air. Berthollet, a very eminent French chemist; claims to have proved by many experiments that a porous, loamy soil, not too wet, and having a good supply of potash in it, may, if well stirred, take up per acre and year from 500 to 700 lbs. of nitrogen from the air. If that is confirmed as true, the farmer may be able, by pro per management, to make this property of soils very useful.

Besides this it has been proved by many experiments by German investigations, that lupine and peas will grow in sand and produce albuminoids without any nitrogen at all in the sand to start with, if only a little water extract of a good soil be poured over this sand and afterwards only pure water, there being only a trace of nitrogen in the small quantity of soil water used, the nitrogen for the albuminoids produced must have been divided from the air, but how is not yet explained. Probably it was first taken up by microscopic plants of a low order in the soil, and from these by the lupine or pea. (1) Oats and buckwheat treated in the same way grew only as long as the nitrogen lasted in the seed planted, showing that plants of this charactar could not get nitrogen in this way from the air. Clover has not thus been experimented with, but no doubt it would behave has did the lupine and pea, and so may be used in another way as a crop feeder not only to feed wheat by converting a sufficient quantity of tough nitrogen food in the soil into tender or easily assimilable nitrogen food to make a good crop, but also by taking up in some way a large additional quantity of nitrogen from the air.

Prof. Caldwell concluded with practical advice when to cut clover to get the most good out of it. He said it should be harvested when at its best for hay, and be turned under when at its best to make the most fertilizing material, and this is when the roots are all alive and green. Letting clover die out was a great loss of fertility.

Milk Fever or Apoplexy after Calving.

Having read many articles and communications from time to time in your valuable paper in reference to milk fever, apoplexy, or, as some call it, drop after calving, I beg to offer a few remarks in reference thereto.

Some years since I had the care of a small herd of well-bred Alderney cows of various ages, and unfortunately, lost three or four with this much-dreaded disease. A post-mortem examination was made upon each animal previous to burial. We found the stomachs were packed full of food, more or less of a dry, constipating nature, and the honeycomb stomach in each case was dry and inflamed.

I founded my own conclusions therefrom, which I have held since, and still believe in, namely, overfeeding, especially on dry food. Since I have adopted the careful-feeding system before and after calving, I have had only one case of apoplexy, and that could be clearly traced to the same cause, only by accident or mistake; this one was a very choice cow. She had been separated and prepared for calving in the usual way, but the day she calved being very cold, I thought she would be more comfortable in the cow-house where she usually stood. I therefore directed the cowman to hurdle off the space of two cows and put her in, which was carefully done; she appeared in good health at the time. She was let loose with her calf, and seemed very comfortable. I gave orders that no hay or dry food should be given her on any account, not even the smallest quantity. The cowman intended carrying out my instructions; but as there was a passage in front of the cows from which they were usually fed, the cowman inadvertently placed a truss of hay in the passage in front of the newly-calved cow, intending to feed the other cows the last thing at night; but being within her reach she speedily and greedily devoured it, and in two days she died, her death resulting, as I think, entirely from the truss of hay put within her reach.

My plan is to keep each cow short of food for a few days previous to calving, and let the food be of a soft relaxing nature; directly before or after the cow has calved give 1 lb. of salts and 1 lb. of treacle in 3 pints of thin gruel, give slowly, and if the cow shows signs of coughing immediately loose her head. As soon as the calf is born sprinkle a handful of salt over it, taking care that it does not come in contact with the calf's eyes. The salt induces the cow to dry the calf quicker and better. That done, give the cow a pail of warm water; tie her up; suckle the calf; keep her tied until she has cleansed. Remove the cleansing, then loose the cow with her calf; give nothing to eat for six or eight hours after calving, then provide a nice soft mash of well-scalded bran and linseed; continue the mashes for three days, three times a day, after which give a little hay chaff, mixed with the mashes; bring on to regular diet gradually; give chilled water at least the first week if in winter. Leave the calf with the cow three days, then remove; whilst the calf remains with the cow take no milk from her unless the calf is weak. As her stock gets full, then milk a little frequently, but by no means milk her dry till after the third day. If the cow is at all tender about her stock (1) bathe with hot water, add a little salt, and afterwards rub the stock with lard. Keep the temperature of the house as even as possible, and see that the place is kept as quiet as you conveniently can. By all means keep away dogs and children the first few days. Whilst the cow is loose with her calf, care should be taken that she does not eat much of her bed. As a safeguard against that I, generally use old thatch, taking care to have it dry. If these few items are attended to carefully, the losses through milk fever will be almost nil.

Heifers will sometimes require milking a few days or a week before calving, which prevents much trouble afterwards. By no means milk them dry. I have seen heifers in great pain some time before calving that they could scarcely stand, and after being partly milked and bathed with hot water, and their stocks rubbed with lard, they have shown signs of comfort and appreciation.

J. L. P.

(1) The experiments above mentioned are now *thoroughly explained* and admitted by scientific experimenters in France and in England. They show that pure burned sand will grow leguminous plants, including clover, without any nitrogen whatever outside of what the atmosphere can supply provided all the mineral elements needed be amply given in a soluble form and provided that a handful or more of rich garden soil (in a solid or liquid form is unmaterial) be added to supply the plants with *bacteria seed*. These living organisations, it has been shown, elaborate in their life functions the free atmospheric nitrogen and thus supply the growing plants with the needed nitrogenous elements of food indispensable to their growth. The "*tough nitrogen*" theory and that "of microscopic plants of a low order" of Doctor Caldwell will no doubt greatly benefit by the bacteria helping nitrification In the mean time Professor Ville of France will rejoice at the fact that science will at last admit the truth of his experiments, by which for the last twenty years he got leguminous plants, including clover, to grow out of burned sand enriched as above.

ED. A. BARNARD.

ABOUT BARLEY CULTURE.

From The Witness.

Director Saunders, of the Central Experimental Farm, has issued a bulletin containing hints on barley-growing, doubtless with a view of aiding farmers in making a fair trial of that

(1) *Stock* is English for *udder*.

A. R. J. F.