farmyard manure can scarcely be looked upon as an absolute essential, inasmuch as it is a bye-product of the farm, and will always continue to be so, a thorough knowledge of its nature and composition must ever remain for the farmer and agricultural student of the highest importance.

"The question of the fertility of the soil is a wide and complex one. It depends on many and various circumstances and conditions. Apart altogether from the influence exerted by climate, latitude, altitude, and exposure, it may be said to be dependent on properties of a physical, chemical and biological nature.

"The first class of properties consist of the absorptive and retentive powers of the soil for water, gases, and heat. These properties depend on the proportion in which the so-called proximate constituents of a soil are present—such as gravel, sand, clay, humus, and lime—as well as on the size of the soil particles, and on their colour. The chemical composition of the soil furnishes, however, the most important source of fertility. As the plant has to derive a portion of its food from the soil, the possession by the latter of the ingredients constituting this food is a fundamental condition of plant growth. A very small portion of the soil is directly concerned in promoting growth. Some of the necessary ingredients are apt to be lacking in sufficient amount, and it is in making good this want that the chief function of manures consists. The substances in which most soils are generally found to be deficient are *nitrogen, phosphoric acid,* and *potash*. Manures, therefore, are chiefly applied to make good this deficiency. While, however, this is so, manures, it must not be lost sight of, perform other and important functions, and may be of value not merely because they supply to the soil nitrogen, phosphoric acid, or potash, but also because they exercise some influence on the soil's mechanical properties, or it may be, in preparing for the plants' use inert fertilising substances. The functions of a manure, therefore, may be very varied, and no manure exemplifies this to a greater extent than farmyard manure."

In another column we reproduce the remarks made by the Director of Public Instruction (in his Administration Report for last year) on the proposed School of Forestry. We may mention that some start has been made in the development of this scheme already. The Conservator of Forests has been sending a number of written "lectures" to be given to the students of the School of Agriculture, and has himself been over at the school to explain and illustrate the substance of these lectures. The great desideratum in a forestry course (as, we believe, Mr. Broun has himself said in his own Administration Report) is the arrangement by which the students may be given a practical training in the subject. This as well as the arrangement for teaching the auxiliary subjects allied to Forestry have as yet to be worked out and to receive the sanction of Government. We trust that the scheme in its fully-developed form will soon come into working, for, despite the opinion of some, who cannot surely fully understand the full significance of the term *forest conservancy* and the work it involves, we believe that there is much to be done in the way of instilling a technical knowledge of our tropical forests into the minds of those who seek admission into the Forest Department, and that it would be a penny-wise policy that would refuse the aid that is necessary to bring our forests under scientific treatment by experts.

FODDER CROPS AND CATTLE-KEEPING IN CEYLON.—IV.

In the previous instalments of this paper two of the important fodder crops grown in the Island, viz., Guinea grass and Mauritius grass, have been dealt with. These two have already gained ground here, and we are more or less familiar with them. It has to be noted, however, that the above grasses do not necessarily thrive in all descriptions of soils, nor under all circumstances; and therefore other species of fodder crops, grown successfully in various tropical and sub-tropical countries, deserves attention in this country, as their introduction would tend to an increase of our fodder supply. The introduction of a new and little known crop is beset with many preliminary difficulties, and takes much time before it meets with any degree of favour. Two crops which are extensively grown in India for fodder purposes deserve special notice. These are the lucerne plant *Medicago sativa* and the Jowari, *Sorghum vulgare*.

Lucerne thrives in good loamy soils and has to be well cultivated if a profitable crop is to be obtained. Being a leguminous plant it is especially partial to soils containing a fair percentage of lime. Before a crop could be raised the land requires very careful preparation. The seed is generally sown in shallow furrows two inches deep and lightly covered up. The furrows are made a foot apart and kept carefully weeded. The land requires artificial irrigation when there is not sufficient rain. The plants grow up in two months and should be cut just before they commence flowering. Under good cultivation, a plot of lucerne could be kept up for years with proper care and manuring and a cutting obtained nearly every six weeks. In this manner an acre of land yields a large quantity of a very nutritious and wholesome fodder. The amount of produce differs greatly according to the nature of the soil, the climatic conditions, and the method of cultivation, and hence it would be misleading to give a detailed account of expenses and profit, especially as lucerne has not been hitherto grown to any appreciable extent in our soils. The results deduced from an experimental crop of a few square yards could show nothing more than the adaptability of the plant to a particular locality. Lucerne as a food, whether it be for horses or cattle, for sheep or milch cows, stands pre-eminently the best among leaf crops.

Sorghum vulgare, great millet, the Indian Jowari or Tamil Cholum, is one of the staple food crops in Upper India. The plant belongs to the grass family and yields a large quantity of nutritious edible grain. The poorer class of ryots in some districts in India live for months entirely on a diet of sorghum. We have, however, to consider sorghum here solely as a leaf crop, and as such it has been found

to be not only an excellent fodder in respect to its nutritive value, but one which produces a comparatively large yield. The method of growing sorghum solely as a fodder crop differs greatly from that which is usual in growing it as a cereal. The plant grows in a variety of soils, it thrives best in loams and rich sands, and a fair crop is obtained even on clayey lands. The seed is sown thick (about four inches apart) in the prepared land and the plants allowed to come up close together. This method of growth gives a tendency to the plants to develope leafage and that less succulent than usual. In six weeks or two months' time the crop is ready to be cut. In some places, especially in sandy soils, the plants are pulled up roots and all and given to cattle. In other places where the lands are richer they are cut close to the ground, and the root stocks allowed to remain. These shoot out again and give a second and smaller crop.

Sorghum thus grown is preserved for future use by converting into hay. Sorghum hay is very sweet and is much relished by all kinds of stock. H. A. D. S.

(To be continued.)

IS SALT A FERTILIZER.

The use of salt for fertilizing purposes still prevails to some extent, and especially in such agricultural regions where fertilizers have only recently been introduced and where the principles of artificial manuring are as yet little understood.

It is true that salt occasionally produces upon some crops and upon certain soils a moderate increase of yield, for a season or two, but the apparent benefit is not lasting; on the contrary such applications leave the soil in an impoverished condition, that is, a continued application of salts is followed by decreasing yields. The effect of common salt is readily explained by the fact that it acts as a solvent upon potash compounds contained in the soil, and potash being plant food causes an increased yield. Salt in this manner acts as a stimulant and enables the plant to draw from resources already present in the soil at a much quicker rate than would be the case under normal conditions, and instead of increasing fertility it promotes a rapid exhaustion of the soil which becomes apparent as soon as the plant food stored therein has been consumed.

Anyone familiar with agricultural chemistry knows that salt does not contain anything that may serve as plant nourishment; it is a simple compound of chlorine and sodium. Chlorine, if anything, is injurious to plants (hence the disastrous effect sometimes observed where salt is used at the time of planting, or in too large quantities), while sodium, though not harmful, cannot by any means assist plant growth. The small quantities needed are always and abundantly present in every soil, and it is not any more advantageous to fertilize with sodium than it would be to use sand or silica as a fertilizer.

Now it has been recently claimed by one evidently not familiar with the simplest agricultural principles that soda may take the place of potash, and he even went so far as to recommend common soda as a fertilizer. How could this be in the face of the fact that ashes of plants usually contain ten times as much potash as soda? It is true that Prof. Wagner demonstrated that plants, when oversupplied with sodium, did absorb more of this ingredient than they would have done had the supply been normal, but there is no experiment on record to show that any plant can live and grow without potash. The ill-advised farmer, then, who follows such extravagant theories and tries to feed his crops with soda, will waste his money and shorten his crop.—*Rural Californian.*

NOTES ON THE CATTLE MURRAIN OF CEYLON.

Referring to the congested appearance of the skin, Mr. Smith remarks:—"I have often seen the eruption, but have noticed at other times an entire absence of it." And the following description of the disease by Veterinary Surgeon Thacker, he considers "a very characteristic description of the various stages of the disease."

First stage.—The attack generally comes on gradually, evidenced by occasional shivering fit; the appetite less; animal appears dull, with drooping ears and a rough staring coat; the bowels costive; rumination ceased or slightly performed; eyes weeping; pulse quickened.

Second stage.—Appetite gone; nose dry and hot, and commencing to discharge thick mucus from the eyes; purging commenced; lining membrane of the eyelids of a dark red colour; pulse quick and small.

Third stage.—Generally lying down from weakness; purging violent and offensive; fœces, mixed with slimy mucus and blood, is passed frequently in small quantities and attended with straining; the eyes become sunk, the countenance anxious; general restlessness, partial insensibility and death.

As regards rumination, Mr. Smith writes:—"It has always appeared to me, from the loaded condition of the rumen found on postmortem, (despite the continued purgation throughout the course of the disease) that rumination must be suddenly suspended at a very early stage of the disease."

"In all outbreaks of rinderpest, I have made my diagnosis as to its fatality, dependent on the severity of the pharyngeal lesions, shown on its outbreak—and have invariably seen all the worst symptoms intensified, fewest recoveries, and deaths more rapid. The virulence of the epidemic seemed to me to be attributable and dependent on the extent and severity the disease had assumed in the fauces; postmortem appearances upheld this view. I observed this form of the disease very marked among buffaloes and that deaths were rapid."

"In a previous page it it characterized as 'absolutely false' to state that rinderpest can develop itself spontaneously. If anyone can answer the following satisfactorily I might be convinced:—

"Why do we find rinderpest becoming developed among the cattle in the wake of an army in the field?

"Why have fairs to be broken up in consequence of outbreaks of this disease?

"Why at gatherings at almost every shrine in India and Ceylon does cholera break out?

"Why is vesicular epizootic annually introduced into Scotland by Irish cattle brought over