

THE following judicious observations and rules for the HOUSING OF CATTLE are quoted by the *Farmer's Advocate* from the *Milch Zeitung*.—

It is a great mistake to believe that cattle can live without injury to their health, in narrow uncleanly stalls, where there is defective ventilation. The breathing of impure air is very prejudicial to their health. The unhealthy condition of the stalls is unquestionably the cause of many diseases, and frequently brings on abortion. It cannot be too emphatically insisted upon that farmers should not shut up their animals in these narrow prisons, where there is little light or air, where dung and filthy water and other unbelongings collect, and where cleanly people cannot enter without disgust. Such cattle cannot thrive, and more especially do young, growing cattle suffer, and, with a regard to cows, both the quantity and the quality of the milk are seriously affected.

Every stall requires the following conditions: that it offer sufficient room for the comfort of its occupant; that it be dry, no dampness being permitted to penetrate the floor or walls; that the temperature be easily regulated; that there be sufficient light; that the ventilation be sufficient to draw away the foul air with becoming haste; that it be kept thoroughly clean without wasteful labor; that the passages be spacious enough for purposes intended; that the mangers be so arranged as to produce a minimum waste of feed; that the arrangements be such as will promote a hasty retreat of the cattle in case of fire.

Having dwelt on the importance of saving the manure—"the soul of Agriculture," the writer continues:—

1.—All the food and water utensils should be kept scrupulously clean, and, when necessary, washed out with lime water or lye. The waste food should be completely taken out before a fresh supply is placed in the manger. Such animals as hens, which render the food uncleanly, should not be tolerated in the stables.

2.—Don't be too saving of the litter; it should be frequently renewed; no wet or dungy portion of it should remain in the stall, and it should be frequently renewed; frequently shaken up and evened about. This is specially necessary to the thriving of the stock, and to the production of clean and healthy dairy products.

3.—The animals, especially the younger ones, should be kept clean by rubbing them at least once a day with a wisp of straw, and grooming them thoroughly with comb and brush at least once a week, being careful not to use a sharp-toothed comb. Never forget to keep the cows' udders clean, rubbing them often, but not with ice-cold water, drying thor-

oughly with a coarse woollen cloth. Cattle breathe, as it were, through the skin, and the importance of maintaining atmospheric communication between the air and the blood through the pores is so great that the animal may become excruciatingly tormented if this hide breathing be prevented by artificial plugging up of the pores. The exterior dirt must therefore not only be removed by grooming, but also the finer dust and loosened scales, which, owing to the sweat cause a plugging up of the pores and an exclusion of the air. This condition throws too much work on the lungs; the more active the skin is kept, the less work will the lungs have to perform. Neglect of this important consideration is a fruitful source of disease; and the animal products, as articles for human food, greatly suffer in point of healthfulness.

4.—The feeding, drinking, milking and outing of the cattle should be punctually attended to; otherwise they become restless, which have an injurious effect on their thrift as well as on their products.

5.—The cattle must have sufficient time between meals to allow their food to digest, so that the more difficult the food is to digest, the longer should be the time between meals; or in other words, keep the most digestible food for the evening meals, so that it will be fully digested before morning.

6.—Feed according to the natural appetites and digestive capacities of each class of animals; and arrange them so that the greatest eaters come together in one stable, thereby causing less labor in the distribution of the coarser and more indigestible foods.

7.—Keep away as many strangers as possible, and never permit dogs or hogs to enter the stables. Anything which disturbs the comfort and peace of the animals has an injurious effect upon their thrift.

8.—Plenty of exercise should be given to each animal daily, according to its ability to stand it. This advice should be strictly followed in reference to growing animals.

9.—Gentle conduct cannot be too strongly recommended. Rough handling not only makes the animals mistrustful and excitable, but also produces profitless results from the food given. Rough, soulless, and irritable cattlemen should never be tolerated about the premises.

THE question, What Chemical Elements are essential to the Growth of Plants? is one of no less interest from a strictly scientific point of view, than it is important in its economic relations. We have not yet reached the full answer, chiefly, perhaps because the efforts to do so have been left too much to the Agricultural

Experimenter, instead of being made in a direct scientific line, which, in such matters, is often the shortest way to truth.

The attention of the British Association was called to this subject, at the recent Aberdeen meeting by Mr. Thomas Jamieson, who appears to have made a series of very careful experiments. These do not entirely justify his conclusions, it is true; but we know that the readers of the JOURNAL OF AGRICULTURE will be interested in hearing what the results were, and some of the lessons they teach.

The food materials essential to plants consist of eleven elementary substances, viz. :—

1. *Carbon, Hydrogen and Oxygen.* These are freely supplied to the plant by the Carbonic Acid of the air and Water, which are both abundant wherever plants are grown. The cultivator does not need to specially supply them.

2. *Nitrogen.* The supply of this element, in nature, although sufficient for the deliberate growth of wild plants, is inadequate to the exuberant and rapid development necessary for artificial production.

3. *Phosphorus, Potassium, Calcium, Magnesium, Sulphur, Chlorine and Iron.* These are distinguished from the two preceding groups by (a) existing in plants in inconstant and often insignificant proportions, and (b) by not entering into organic (plant) compounds in the definite chemical ratio that can be expressed in a chemical formula.

The special object of the experiments undertaken by Mr. Jamieson was to ascertain whether all or any of the seven elements in the third group were really necessary as plant food.

Phosphorus is its most important member. Twelve plots of uniform sand, were supplied with a uniform mixture, containing all the elements understood to be necessary for plant growth, *except phosphorus*. Phosphorus was then applied to ten of the twelve plots and withheld from the remaining two.

Results: In the two plots from which phosphorus had been withheld, the plants absolutely refused to grow beyond the first few leaflets, and made only abortive attempts to form a bulb. The averages of experiments with various sources of Phosphorus yielded the following results, each plot being the thousandth part of an acre :—

	Weight of Turnips (water extracted).
Superphosphate.....	87½ ounces.
Bone Ash.....	86 "
Steamed Bone Flour.....	85½ "
Coprolite	83 "
Steamed Bone Flour and Coprolite	80 "
No Phosphate.....	3½ "