from cold; this is because he needs a fresh supply of material to burn in the lung for the purpose of keeping up his vital warmth. Every farmer knows, or ought to know, that if his animals in winter are kept warm, and sheltered, they do better than those that are exposed in the open air to the cold. This is because in the latter case a large part of the food which would otherwise have gone towards fattening the animal, is used up in the increased respiration necessary to keep him warm.

It is worthy of notice, that in this grain, which is taken in fair marketable condition, there is, according to the table, about ten pounds of water to each one hundred of grain. New wheat frequently contains from twelve to sixteen pounds in one hundred.

I may here say a few words, as to the various practices which are followed in cutting wheat. If allowed to become dead ripe in the field, a considerable portion of its starch and sugar is changed to epidermis, or woody fibre, that is the skin. The grain will then yield more bran, and less fine flour, than it would have done if cut ten days or a fortnight earlier. The result of many careful experiments has shown that when cut at about the above time before entire ripeness, the grain is heavier, more plump, and actually measures a greater bulk. The skin is thinner than it would have been if allowed to stand, for the causes mentioned above, and therefore more fine flour is obtained to the bushel.

The same reasoning applies to the straw. It is well known that if wheat be mown and fed to stock while green, even with heads cut off, it is an excellent fodder; and it is equally well known that if allowed to stand in the field till the grain is ripe, the straw consists of little but dry indigestible woody fibre. Now the same change takes place, to a certain extent, in the straw, as in the grain; it also contains some gum, sugar, &c., and is therefore nutritious while green, but as it ripens, nearly all of these are converted into woody fibre, in the manner that has been mentioned.

By cutting the grain then, before it is quite ripe, a double object is gained; its own quality is improved, and the straw, when cut up with hay, &c., is readily eaten by stock, and has really some nutritive properties.

I will now call your attention to the columns representing the composition of the ash in one hundred pounds.

The most important point, and that which I particularly ask you to remember, is the large quantity of phosphoric acid in the ash of the grain. The above analysis is the average of six or eight, by eminent chemists, and is given by Johnston in his lectures. Phosphoric acid, it will be seen, constitutes about half of the whole ash. If we look at the ash of the straw, we see that it contains but three pounds in one hundred. The cause of this difference becomes beautifully apparent, when we consider that the grain is the part more especially designed for food. This same substance, phosphoric acid, constitutes the leading body in, and gives their peculiar properties to, the bones of animals; hence the necessity that it should be concentrated in the grain, which is the part peculiarly intended for food, along with the gluten which is to clothe the bones with muscle.

I do not attempt to explain here the precise nature of the substances to which I refer, as it would prevent my presenting an entire view of this subject, without wearying my audience. Those who do not know what they are I must ask to believe that they do not exist, and to take my word for their properties and effects, until they can obtain access to some book or some other means of studying them out for themselves.

Other important substances in the ash of the grain, are potash and soda; they amount commonly to about one-third of its whole weight, and are valuable, as also necessary for the animal, being always found largely in the flesh and blood; thus we see that the grain in all its constitution, seems to have been especially adapted to serve as an appropriate food for the animal; each little seed contains within itself its proportion of material for the formation of the bones, the muscle, the blood, the fat of the body, and also for maintaining its warmth.

In examining the constitution of the ash from the straw, we find that the leading substances there are called silica; this is that which constitutes the common flint, common granite, chrystals, agates, &c. Although so hard and insoluble in acids, yet plants have the power of dissolving it, and are thus able to make use of it for their own purposes. Silica gives the hardness and the glaze to the outer part of the straw, and is supposed to be principally in use in strengthening it, and enabling it to uphold its load of grain.

When a particular piece of land fails for years in succession, to produce a straw that will stand, it is generally found, on examining the ash of this straw, that there is a deficiency of silica. The column referred to presents an average of six or eight analyses, and the proportion of the silica given by it, is about two-thirds of the whole ash. Sulphuric acid (oil of vitriol), is usually present in considerable quantity in the straw ash, while there is little in the grain ash. Potash and soda are greatly reduced in quantity. There is a curious fact here indicated, relative to the lime and magnesia. In the grain magnesia, and in the straw lime, is most abundant; this is almost invariably the case, but we have as yet no clue to the reason.

It is at once perceptible, from a glance at the above columns, that each of these parts has a composition of its own as to its ash, and the differences are of a very important nature. This point will be referred to again.

I have said that one hundred pounds of grain yield but about two pounds of ash, oftener less than more. If we burn one hundred pounds of straw, the ash will weigh from six to ten pounds, sometimes even as high as sixteen. There is thus a great difference in the quantity as well as the quality of ash in these two parts; the straw from an acre will of course contain more ash than the grain.

EXPERIMENTS WITH BURNED CLAY—WHAT ARE THE QUALITIES WHICH FIT A CLAY FOR BURNING.

Burned clay has by many been recommended as a usefui application to the land; and, in numerous instances, it has been a source of profit to those who have employed it. Mr. Woodward states, that it renders the soil more friable, so that it can be worked with less labor, and especially aids the culture of green crops. On a crop of wheat grown upon drained Oxford clay