

mailed, for the purpose of ascertaining whether there was any difference in the consumption of it and of the straw grown on his home farm at Millhill, because he had found a very material difference in their feeding properties. The straws grown on the sea level, and at 850 feet above it were analysed for a similar reason; it having been stated by Mr. Harvey, of Whittingham Mains, that there is believed to be a difference in their feeding qualities. The analyses scarcely bear out this opinion, as far at least as these two samples are concerned; for though that from the high level is slightly superior to the other, the difference is so small that no conclusions can be drawn from it; indeed, specimens from different localities vary to a much greater extent.

Passing from these points to the more general considerations regarding the nutritive properties of straw, it must be observed that their value is much higher than might have been expected. The position in which they stand may be best rendered obvious by a comparison with the turnip. That root contains on the average from 1.2 to 1.4 per cent. of albuminous compounds, and 4 or 5 of respiratory elements, of which 3 or 4 are soluble in water. It will be observed, then, that, as far as nutritive matters are concerned, straws generally stand far above the turnip, surpassing it slightly in the albuminous, and enormously in the respiratory elements. As a large number of these elements they must hold a very high position, and in this respect are surpassed only by the grains and some few other substances. When compared with roots and grains, however, a very marked difference may be observed between the relative proportions of these two great classes of nutritive elements. The ratio of the albuminous to the respiratory compounds is, in the turnip, as 1 to 3 in round numbers, and in the grains as 1 to 7. That is to say, for every pound of the albuminous compounds contained in a grain, as wheat for example, there will be about 7 pounds of respiratory compounds. In the straws, the proportions are very different, the respiratory compounds being never less than ten, and sometimes nearly thirty times as abundant as the albuminous. If the soluble portion of these substances only be considered, then the ratio approaches nearer to that observed in the more concentrated foods, though on the whole the excess of respiratory elements is very marked.

Returning now to the comparison between the grain and straws, it is obvious that though the former greatly exceed the latter in the amount of substances which may be absorbed, no one would for a moment think of asserting that straws are therefore of greater nutritive value. The reverse is undoubtedly the case, and the proof of this is to be found in several considerations. 1st. It must be attributed in part to the small proportion of those classes of nutri-

tive substances; for if highly nutritive substances, such as the turnip and grains, contain a relatively much larger proportion of albuminous compounds, then it may be expected that in the straw the small quantity of these substances will cause the assimilation of only a proportionate quantity of the respiratory elements, and the surplus will be waste. Hence also the use of highly nitrogenous foods, such as oil-cake and bean-meal, along with straw, must be considered good practice. 3rd. It may be fairly anticipated that the soluble portion of the nutritive matter will in general be of little, or possibly sometimes of no use. 2nd. Owing to the difficulty with which the soluble matters pass into solution in water, a considerable part of them may escape digestion. And in this respect the contrast between straw and turnip is very marked. In the latter the larger proportion of the constituents are not only soluble, but already dissolved in the 90 per cent. of water present, but in the former they are not dissolved, but are in the solid state in the dry straw, and must undergo the process of solution, which is effected during mastication and rumination. The difficulty of dissolving the soluble matters of straw in cold water has been already adverted to, and even when warm water is used the process is slow, and requires considerable time. From this it may be concluded that straw ought to be well moistened and steamed before being used. 4th. The large proportion of woody fibre existing in all straws must interfere materially with the production of the full effect of its nutritive elements.

Notwithstanding these drawbacks, the general conclusion to be drawn from this inquiry is, that straw, and more especially oat straw, possesses a very considerable nutritive value, but that it is most advantageously used along with the more highly nitrogenised foods. It must be observed, also, that in a mechanical point of view, it may even have its uses in the intestines, and by giving bulk and firmness to the mass of food contained in them, assist the process of digestion and absorption. Such are the conclusions to which analysis leads; and I will only add, that a minute and careful series of feeding experiments with straw, under different circumstances, would be a great boon to practical agriculture.—*Transactions of Highland Society.*

The Farmer as an Observer.

It has long seemed to the writer that the greatest defect in agricultural literature, as in all other, is the want of originality. As said a gentleman of the Empire State, several years ago to the writer, "we have had what is known up over again and again by editors and contributors to papers, who have done nothing really to advance the art of farming and stock-breeding. What we most want is men who by experiments