down to 1·15 per cent. It will be seen that, in calculating the proteids in column 2 from the nitrogen, 5·7 has been substituted for the old factor 6·25. This has been done in deference to the investigations of Osborne & Voorhees, and the practice of Prof. Snyder. Instead of 16, the old percentage of nitrogen which all vegetable proteids and animal albumenoids were assumed to contain, glutenin and gliadin, the chief nitrogenous constituents of wheat, contain respectively 17·49 and 17·66 per cent. The corresponding factors for converting the nitrogen into the proteids would be 5·72 and 5·66. In his recent paper on the determination of gliadin* Professor Snyder adopts 5·7 as the factor for the total proteids, which practice it will be convenient to follow in regard to all the different proteids of wheaten flour. From column 2 it will be seen that the wheat proteids contained in the purchased samples vary from 12·71 down to 6·56 per cent, which means that some flours contain twice as much as do others of these valuable flesh and blood forming substances. Among the Montreal standards the proteids range from 10·69 to 7·34 per cent, and it appears that, out of the 75 collected samples, 16 have percentages outside of these limits. Ten are above 10·69 per cent in wheat proteids and six are below 7·34. It will be seen later that some of these have been subjected to a closer chemical examination.

The names given to the Montreal standards must not be taken as affording any indication of the origin of the wheats which yielded the flours. These may come from the winter-grown grain of Ontario, or the hard varieties of Manitoba or may be from mixtures of both. Neither is there anything in the designations of the purchased samples to show from what variety of wheat they are derived. It appears that there is no such thing in these modern times as grinding the whole of any particular lot of grain into flour, shorts and bran. Much more frequently flour is obtained from a mixture of different varieties of wheat, and different grades of flour may be obtained from the one mixture. The art of milling has been revolutionized and its operations are difficult to follow.

It has already been mentioned and will be seen from Table I that the percentage of dry gluten is invariably higher than that of the wheat proteids. This is not surprising, for an average sample of dry gluten consisting of a number of cakes from different flours ground up together was found to contain only 12·40 per cent of nitrogen which corresponds to 70·68 per cent of wheat proteids, or what Jago has called "true gluten." If in the gluten test there were no loss of nitrogenous substances the ratio of proteids to dry gluten would therefore be about 1 : 1·43. This figure is actually reached in the case of "Strong Bakers'" among the Montreal standards and in two brands among the flours made by the Lake of the Woods Milling Co., as will be seen on consulting column 1 of Table I. Among the samples taken in the open market this ratio varies from 1 : 0·82, but it would be wrong to assume that the lower a flour is in the of proteids, the lower will be the relative quantity of dry gluten which the ...s. There are flours entered in the table in which the percentage of wheat p... ...s about 8 and the proportion of these to dry gluten is 1 : 1·39. On the other hand there are samples with about 11 per cent true gluten in which the ratio in question is as 1 is to 1·12. This ratio would appear however to be of value for indicating the physical character of the gluten in a flour, independently altogether of its percentage. The following quotation from †Jago will help to explain this matter. 'The value of estimations of true gluten as a check on those of crude gluten has already been indicated, but they have also an additional importance. Suppose, for example, two flours each yield 35 per cent of wet gluten. One is hard, elastic and springy, while the other is soft and flabby, and causes the washing water to become 'lathery'. It will at once be said that the former is the higher quality gluten of the two, and quite correctly; but, further, the results would be entered that each yielded the same quantity of gluten. This latter deduction is not all the truth, for in the former case hardness of the gluten will have permitted most of the starch to be entirely eliminated with the least possible loss of real gluten constituents. In the second instance the gluten will have begun to wash away while yet there is a considerable quantity of starch remaining.' It would,

*Science and Art of Breadmaking, 1895, p. 514. †Journal of the American Chemical Society, xxvi, p. 26.