

chemistry of wheat, and computed the coefficients of correlation for the important chemical characters; he has shown that there is a very close connection between quality, quantity, and amount of gluten present.

Another method of arriving at the strength of flour is to determine the amount of water retained by the gluten extracted from any sample (3). In New South Wales the proportion of water taken up by the flour itself has been regarded as a good indication of strength (4). Lastly, the percentage of ash serves, among other things, as an indication of the skill of the miller (5 and 6).

These methods may not apply equally to wheats grown under New Zealand conditions. But even if no single property is an unfailing measure of strength, it is probable that from a consideration of several a very good idea of the quality may be obtained. Only by further investigation of varieties grown under local conditions, and collection of data obtained from them, will more information be obtained.

It was pointed out in the previous article that the cause of strength, or lack of it, is due to three main factors—climate, soil-fertility, and variety. Fertility, of course, affects yield of wheat, but apparently not strength of flour (7 and 8). There remains the varietal factor, and there is no doubt that strength may often be improved by proper selection and breeding.

EXPERIMENTAL WORK.

Some sixty-six samples were milled in this Laboratory, and further examination was made as to the probable strengths of the resulting flours. A selection of the results obtained is tabulated in the accompanying Table II.

It is to be regretted that only a few samples of Pearl were received. It will be remembered that this variety gave as a rule a very good yield of flour. Referring to Table II, it will be seen that the sample with the lowest percentage of flour (P 305) contained the most valuable amount of protein; but the other three samples—which, on the other hand, all yielded very good amounts of flour—were all very close in protein content to the highest. The amount of water absorbed per cent. of flour reached a good average in these samples. It will be seen that the amount of dry gluten was approximately the amount of total protein present; the ratios of wet to dry gluten showed considerable divergence, but in view of the small number of samples received nothing further can be said on these figures.

A more satisfactory number of samples of Velvet was received. The sample giving the second highest yield of flour (P 294) also contained 15.75 per cent. of protein, which is a remarkably good figure. Its water-absorption figure was also high, and the ratio of wet to dry gluten was satisfactory. This wheat—from Dumbarton,* near Roxburgh—appears to be a wheat of all-round excellence. It is followed closely by three samples which also showed very good protein content. Of these three it appeared that the lowest in protein

* This and all other samples from Dumbarton were grown at the Moa Seed Farm.