

## TESTING OF NEW-ZEALAND-GROWN WHEATS.

### II. STRENGTH OR QUALITY OF FLOUR.

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THE best wheat is that one which will produce the greatest amount of flour of the best quality. In the previous article, printed in last month's *Journal*, the amounts of flour obtained from wheats grown in various localities in New Zealand were considered. Yield of wheat per acre and yield of flour are indeed important considerations; the miller, however, has to supply the market with a product of as good quality as possible. He judges a flour largely by colour, strength, and weight of flour per bushel of wheat. By blending the very best wheats with more average samples he endeavours to maintain a satisfactorily high standard, and one which satisfies the requirements of the baker and the consumer. Since it is the quality or strength of the flour which really determines the demand and the value of a wheat, this factor of strength is no less important than those other considerations. A strong wheat has been defined as one which yields flour capable of making well-piled loaves.

The strength of flour, then, is its apparent and potential ability to produce a large loaf of good texture: a hard wheat will generally produce a strong flour, a soft wheat a weak one. It is a well-known fact that if the starch is carefully washed away from flour a curious plastic elastic mass remains. This is the so-called gluten, which is a mixture of two nitrogenous chemical compounds, gliadin and glutenin. Gluten imprisons gas generated by the fermentative processes due to the addition of yeast, and in this way enables a loaf to retain, after baking, that texture so characteristic of well-baked bread. Many attempts have been made to correlate strength with any one constituent as determined by chemical analysis. For many years discussion of strength centred on whether the protein (or gluten) content of a flour was or was not a true indication of this quality. Proteins, it will be remembered, are a group of compounds present in plant (and animal) tissues, easily assimilated by the body and contributing to the formation of muscle, &c. It was at first thought that the amount of gluten (which is very closely related to the total amount of protein) was the controlling factor; then the idea became general that the quality of the gluten was all-important and the quantity rather negligible. Many other factors which at first sight have appeared rather contradictory have been considered at length, and in the light of fuller knowledge found often to be supplementary in character rather than otherwise. It is true that much remains to be done; at the same time it is likely that the truth lies between many divergent statements of fact and of theory. Stockham (1) thinks that the total quantity of gluten present is important, and that a consideration of quantity no less than quality is essential to an understanding of strength. In applying the statistical method Zinn (2) has compiled a large amount of published data on the