

(7.) Research in New Zealand: Address by P. Marshall, M.A.,[†]D.Sc., President New Zealand Institute, 1926.

It would certainly improve the prospects of successful research if the efforts of investigators in this country were more organized. At the present time it may often happen that overlapping takes place. One and the same subject of research may be attacked by workers in different parts of the country, both of whom may labour over long preliminary observations and measurements without knowledge of one another's activities, and also without that encouragement and mutual assistance which results from comradeship, more especially in research than in other activities of life.

While it is a maxim with scientific men that no distinction can be drawn between pure scientific research and economic research, it still remains true that there are certain industries and pursuits that seem to require the aid of research in order to remove some difficulty in operation or to improve the quality of the product.

It is research of this kind that is most favoured and encouraged in New Zealand. While it is obvious that direct attack of the problem is the most promising, it may often be the case that the final solution will be obtained from some other line of research which may appear remote from the problem and devoid of bearing on it.

It is perhaps in connection with the utilization of brown coals that work on our mineral resources has its most promising outlook. The fragile nature of these fuels when burning renders them unsuitable for use on the railways. Much work is now being done with the object of treating them in such a way as to render them of service for this purpose. Success would ensure the employment of much additional labour, and the firing of locomotives in the North Island at least would be less costly.

(8.) Report by Dr. Marsden on Scientific and Industrial Research, unanimously endorsed by the Committee on Scientific and Industrial Research appointed by the Internal Affairs Department, Wellington, 1925.

The real foundation for such help as the industrialists require should be the extension of Dr. MacLaurin's laboratory to include tests of a physical nature. The cost would probably be some £10,000 for buildings and £10,000 for equipment, while there should be added to his staff one good engineer-physicist at a salary of approximately £600 per annum, one research physical chemist, and a first-class mechanic with a workshop. The physicist should be chosen and sent to the National Physical Laboratory, London, for one year's training. The functions of the Dominion Laboratory would then be extended by the following:—

- (1.) The custody of the standards, which involves their care and preservation, and also the intercomparisons and researches necessary to maintain the constancy of such standards as are liable to change.
- (2.) The construction of standards as required by scientific or technical progress.
- (3.) Standardization of measuring apparatus for manufacturers as a test of their output, or for the user that he may verify instruments or materials independently.
- (4.) Technical research upon problems connected with standards.
- (5.) Determination of the properties of materials for general use in technology and trade. Tests of length, volume, trade weights and measures, time, electricity, conductivity, electrolysis, testing materials, cements, steels, clays, paints, twines, oils, mass, density, current voltages, resistance, photometry, heat and thermometry, concrete, bricks, inks, mucilages, ropes, paper.

The Bureau should also undertake all testing for Government Departments—Public Works, Railways, Defence (including aeronautics) and Department of Industries and Commerce. There is too much of a tendency for Departments to become watertight in regard to scientific work, and the sooner such an institution as outlined above is established the easier it will be to prevent this overlapping and waste expenditure.

Industrialists must realize that quality of goods depends upon definite measurable properties, and therefore such a laboratory, with standard measuring apparatus and facilities for all kinds of measurements, is really the best way in which they can be helped.

There is a great advantage in the association of the physical and chemical measurements under one head, since most industrial problems require for their solution a combination of these branches of science. Not the least important aspect of such an institution is the enormous part it would play in the event of this country being at war with another. This aspect was well exemplified during the late war by the important part played by the National Physical Laboratory in England, and Bureau of Standards in America. A library should be associated with the suggested central laboratory.

The Director of the Institution would make such use of the laboratories and staffs in the various University colleges and Government Departments as is considered desirable. He would be assisted in his work by the officers of the Department of Industries and Commerce, who would act as liaison officers between the industrialists and the laboratory.

In my opinion such an institution could well be placed under an Advisory Board consisting of representatives of the four chief industrial associations, together with four representatives of the Government. It should be noted that in America the laboratory is placed under the Department of Commerce, and I rather incline to the view that such should be the case in New Zealand.