In association with the Laboratory, and located adjacent to it, are two major industrial research laboratories—namely, the fuel-research laboratory and the leather-research laboratory.

In connection with this work for the secondary industries the need has arisen for tests of a physical nature apart from purely chemical investigations. Arrangements are in train for the co-ordination of the physical and engineering testing facilities of the Dominion and the establishment of a Standards laboratory for ultimate standards of electrical and other units, so that complete tests of New Zealand products may be made for comparison with standard specifications.

A large amount of work also is being carried out by way of standardizing and testing materials suitable for roadmaking. The staff of the Laboratory also have prepared abstracts of various scientific publications and made these available for general distribution through the Department's *Journal* and by means of bulletins.

GEOLOGICAL SURVEY OFFICE.

Since last year's report was presented the Geological Survey has issued an areal bulletin covering 1,284 square miles in the East Cape district. Detailed geological exploration is proceeding in an adjoining part of the same oil-bearing region, and in the Murchison district, where there are many gas-springs and oil-seeps. A large area near Te Kuiti is being mapped to provide data for a soil survey of extensive tracts of easy pastoral country on which stock do not thrive—probably owing to some mineral deficiency in the herbage. Another season's work should complete the mapping of the North Island volcanic zone, when the question of establishing a vulvanological observatory may be intelligently considered.

An accurate map is the basis of all geological work, as, indeed, it is of modern engineering and of scientific work in forestry and agriculture. Even after the Lands and Survey Department has supplied all available data, at least half of the geologist's time is taken up in completing a topographical map to the degree of precision required. A contoured map is highly desirable, but time enough for its preparation cannot be spared. During the last twenty-five years the Geological Survey has mapped in fair detail about one-quarter of New Zealand. If this work, absolutely essential in so many of the tasks confronting those engaged in developing the natural resources of the country, be they mineral, forest, agriculture, transport, or water for power or irrigation, is to be completed within reasonable time, it is urgent that the rate of mapping be greatly increased. Aerial mapping appears to be the cheapest and best way to do this. The methods are so well standardized and so flexible, and the advances made in the design and construction of cameras and the refinements of photographic films and papers, allow of the production of pictures of such remarkable clarity and detail as to have the very widest use. The Secretary of the Department made a special investigation of the extensive use of this method by the Geological Survey Offices of both Canada and the United States, and there would appear to be no reason why it should not be adopted in New Zealand, so that the geological-survey work may be expedited without increase of staff of expert geologists.

PETROLOGICAL LABORATORY.

A great deal of additional work has been carried out in connection with the collection of samples of New Zealand building-stones. Many different kinds of stones have been dressed, polished, and submitted to various tests by which their suitability for use in construction may be gauged. The work carried out indicates that there is in New Zealand a great variety of building-stones, in accessible localities, available for quarrying as soon as there is a sufficient demand for them.

The vitric tuff mentioned in the previous report has not yet been used for any considerable constructional purpose. This would appear to be due to a disinclination to incur the initial expense involved in the opening of a quarry until such time as a large demand is assured.

A question arose as to whether this rock would resist the chemical action of atmospheric acids in urban areas and on the sea-coast. Tests have indicated that the stone is unaffected by the action of strong mineral acids, even when immersed in boiling solutions.

An illustrated bulletin containing descriptions of New Zealand building-stones, their qualities and suitability for various constructional purposes, and their accessibility, is now in course of publication.

The research on the nature and abrasion of beach materials has been much extended. The object of this is to discover the source and movement of the materials that drift along the New Zealand coast in large quantities. These constitute a most formidable obstacle to the construction and maintenance of many harbours on the New Zealand coast. Large numbers of samples have been collected from rivers and beaches, and by dredging off the coast to a depth of 10 fathoms.

A further series of results and conclusions is now in course of publication. Much of the information that has been obtained should be of value to harbour engineers. Up to the present most of the work has been carried out on the beaches and in the water round Napier, though samples of sand for examination and grading have been obtained from many localities.

Many rock materials have been tested for their suitability for use in road-construction, particular attention is being paid to the deposits of gravel that extend so widely throughout the country; and the services of Dr. Marshall have been utilized on numerous occasions by the Public Works Department for special investigations.

METEOROLOGICAL OFFICE.

The function of the Meteorological Office is to co-ordinate meteorological effort in the Dominion and to provide, as far as possible, such information on the various weather factors as is required by different sections of the community according to their various avocations. The information provided falls under two heads: First, there is that regarding current weather, which is given by means of daily forecasts and reports of observations; and, second, the climatological data derived from the accumulated statistics of years.