

have elapsed since Cook met his death at the hands of savages in the Sandwich Islands, and it is remarkable that no monument to his memory should have been erected in the capital of the Empire. But if the statue is late it is undoubtedly adequate. The British Empire League deserves the gratitude of all citizens of the empire for its public spirit in raising so worthy a monument to one who extended the imperial bounds.

But James Cook (1728-1779) was more than this. He was a geographer of no mean standing, and his name will go down to posterity as one of the earliest of British discoverers. His three



Photo.] *[A. Burchell, t. ulham.*  
Statue of Capt. Cook.

voyages, all of them scientific, are well known by now. The first (1768-1770) was undertaken at the instance of the Admiralty, which was moved thereto by the Royal Society, for the purpose of prosecuting geographical researches in the Pacific Ocean. Several well-known men of science accompanied Cook on his voyage, on which, among other things, he struck the coasts of New Zealand and Australia. Round the former he sailed with complete success, examining it in detail; his name is associated with the channel which separates North from South Island (Cook's Strait). Of both New Zealand and Australia he took possession for

Great Britain. The second voyage (1772-1775) had for its object the supposed southern continent in the Pacific, and Cook was able to prove finally that no such continent existed. It is worthy of note that on this second journey he reached latitude  $71^{\circ}49'$  S. The third expedition was fitted out in 1776, and was principally to settle the question of the North West passage. It was on this voyage, in 1779, that Cook was killed.

Besides his contributions to geography, Cook was also an astronomer and mathematician. His skill as a geographical surveyor he had already shown as early as 1760, when he sounded and surveyed the St. Lawrence river and published a chart of the channel from Quebec to the sea. This activity he continued when, in 1763, he was appointed "Marine Surveyor of the Coast of Newfoundland and Labrador." It was shortly after this appointment that the Royal Society elected him one of its Fellows, on his giving an account of an eclipse of the sun which he had observed on the south coast of Newfoundland.

#### THE WILDS OF NEW ZEALAND.<sup>1</sup>

DR. J. M. BELL was for six years the director of the Geological Survey of New Zealand, and during his service there his duties and inclinations carried him into several of the most remote and least settled areas. A series of valuable memoirs on New Zealand geology has already testified to the enthusiasm and energy with which he threw himself into his work. In this volume he records his general reminiscences of his travels, and describes his numerous adventures by the flooded rivers, on the mountains, and in the bush, and narrates various incidents in the early history of the dominion. He was greatly impressed by the rich variety in both the topography and geology of New Zealand, and was delighted with its superb scenery, which is illustrated by a well-selected collection of excellent photographs by the Government Tourist Department, and by a series of artistically coloured sketches by his companion, Mr. C. H. Eastlake.

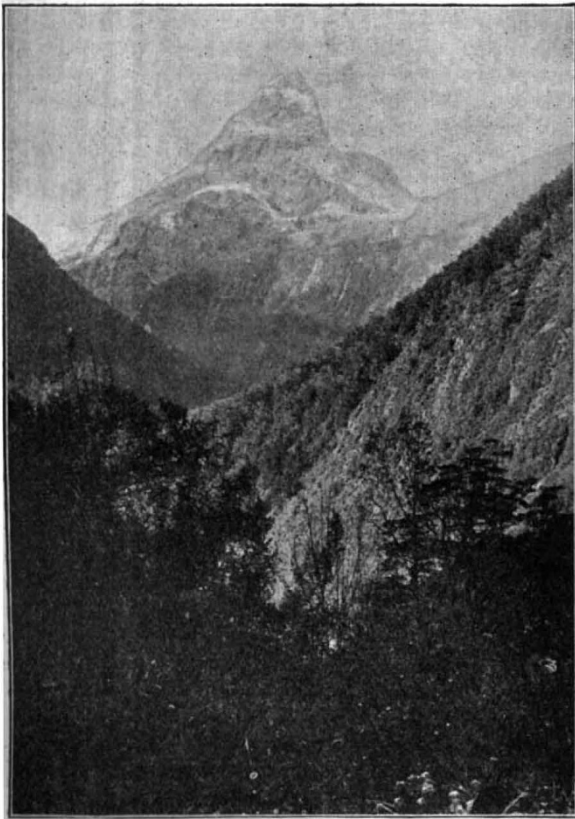
One of the first chapters describes the north-western province of the North Island, where Dr. Bell went to inspect the diggings for Kauri gum, which by 1912 had yielded produce to the value of more than 16,000,000*l.* In connection with his visit to the Thames goldfield, he summarises its mining history, and in connection with the volcanic fields of the North Island, describes his winter ascent of the volcano Ngauruhoe, a climb rendered difficult as the snow around the base was loose and soft, while that on the final slope was dangerously hard and steep. He also describes again the famous eruption of Tarawera, but the Black Geyser, Waimangu, it may be remarked, ceased to discharge daily six months earlier than the time mentioned by Dr. Bell. The most adventurous journey described in the volume was an attempt with Prof. Marshall, of Dunedin, to reach Mt. Arthur in Karamea, the north-

<sup>1</sup> "The Wilds of Maoriland." By Dr. J. M. Bell. Pp. xiii + 253 + p'late  
London: Macmillan and Co., Ltd., 1914.) Price 15*s.*



western part of the South Island, when, owing to the roughness of the way and a wrong route, four days' provisions had to serve for seven, and the party might not have survived except for some chance birds that were killed by stones.

The last chapters describe Dr. Bell's journeys in the Southern Alps, and give a brief summary of the geography and climate of New Zealand. Most of the author's results have been stated in his geological papers, and as the present work is essentially popular he has excluded technical matter; but he writes of different areas with the intimate knowledge gained in the course of his surveys. The book gives an interesting account of the author's journeys, and is a useful record of the present conditions of some of the less-



Mount Balloon, near the track to Milford Sound. From "The Wilds of Maoriland."

known parts of New Zealand; it conveys a good impression of the magnificence and variety of New Zealand scenery, but indicates that the conditions of travel there are exceptionally rough and the accommodation often poor.

#### RECENT PROGRESS OF THE METRIC SYSTEM.<sup>1</sup>

WE have received a copy of a report on the progress of the metric system which was presented by Dr. Guillaume at the meeting of the fifth general conference on weights and measures held in Paris in October last. A previous report

<sup>1</sup> "Les récents Progrès du Système métrique." By Ch. Ed. Guillaume. Pp. 118. (Paris: Gauthier-Villars, 1913.) Price 5 francs.

by Dr. Guillaume on the same subject was reviewed in these columns in 1908 (April 30). In the first part of the present work the author deals with the question of standards of measure and weight. As regards the use of vitreous quartz or silica for the construction of standards of length he points out that recent investigations tend to show that this material is unsuitable for the purpose, owing to inconstancy of length. A historical account is then given of the attempts made at the international bureau to find an appropriate material for the construction of standards of length for use in the laboratory, where the question of cost prohibits the employment of iridio-platinum. These efforts led to the important series of investigations with respect to the metrological properties of the alloys of nickel and steel, and to the discovery by Dr. Guillaume of the alloy of minimum expansion, now well known as "invar." The feeble expansion of invar would render this alloy an ideal material for standards of precision were it not for its tendency to instability. In spite of this drawback, however, its use for secondary standards deserves careful consideration in cases where an accuracy of one part in a million is sufficient.

Researches have also been made with the view of finding suitable alloys to replace iridio-platinum for the construction of secondary standards of weight. Various non-magnetic alloys of nickel were investigated. Of these constantan was found to be unsuitable, owing to its lack of durability, but "baros," formed by the addition of small quantities of chromium and manganese to commercial nickel, has proved to be more satisfactory. Tungsten, in virtue of its hardness, high density and durability, promises to be a very suitable material, especially as it seems likely that this metal will soon be obtainable at a relatively low price. Dr. Guillaume also discusses the results of recent researches with reference to the employment of wave-lengths of light in metrology, and points out that the gases krypton and neon both afford special advantages as regards interference measurements.

A section is devoted to legislation with respect to the metric system in various countries since the fourth general conference. During the past six years the system has been made obligatory in several countries, notably Denmark, Siam, the Belgian Congo, and certain of the republics of Central America. Dr. Guillaume considers that the difficulties standing in the way of the adoption of the system in Great Britain and the United States have been greatly exaggerated by its opponents. He urges that in the engineering trade, for example, the proposed innovation would not, as is often alleged, necessarily put out of use all machines the dimensions of which could not be expressed in convenient figures in terms of metric units; the first reform would be simply to give the metric equivalents of the quantities hitherto expressed in Imperial units; later on, when the machines were being replaced by new ones in the usual course, any slight modifications required might be introduced.