

authorities should abolish foreign quarantine and other restrictive measures against this disease.

(d) The section resolves that the malady known hitherto under the name of Malta fever shall in future be named "undulant fever." (Submitted by the section of tropical medicine and hygiene.)

(C) That this congress records its conviction that experiments on living animals have proved of the utmost service to medicine in the past, and are indispensable to its future progress. That, accordingly, while strongly deprecating the infliction of unnecessary pain, it is of opinion alike in the interests of man and of animals that it is not desirable to restrict competent persons in the performance of such experiments. (Submitted by various sections.)

THE CONTINUATION OF MILNE'S WORK IN SEISMOLOGY.

A WELL-INFORMED writer in *The Times* of August 7 has insisted on the importance of securing the continuity of the late Prof. Milne's great scheme of seismological observation and research. Milne himself always fought strenuously against his own undertaking being absorbed and lost in any international scheme. It is true that in connection with the international system there are some admirably equipped laboratories, furnished with a variety of instruments of extreme delicacy and sensitiveness; but the establishment of one of these is so costly an undertaking that such laboratories can never become numerous. Milne's aim was to secure a great number of seismological stations, scattered as widely as possible over the globe, each furnished with instruments of the same pattern, the records of which would be strictly comparable. The practical results which have been secured by Milne's scheme have shown that the comparatively simple type of apparatus which he advocated has furnished just such an observational basis for research as is necessary. Milne, at the outset, saw in the British colonies and dependencies the means for a wide extension of his scheme—though he by no means limited his efforts within the Empire. It would, indeed, be a disgrace, as well as a misfortune, to British science if the great undertaking originated by Milne were to suffer dislocation, or to be lost by absorption in any other scheme; and, at the same time, no more worthy monument to Milne's enterprise could be imagined than the maintenance and development of the system of observations to which he devoted his genius and energy, and for which he received little practical encouragement during his lifetime.

It is a very fortunate circumstance that the British Association is holding a meeting so shortly after Milne's lamented death, for no time must be lost if his invaluable organisation is to be rescued from the ruin which is threatened by the loss of its master-spirit. From the year 1841 onward, the association has been the nursing mother of seismological science in this country, and has helped Mallet, and afterwards Milne, by contributions from its funds, and especially by publication of their results. Milne was always ready gratefully to acknowledge the great

aid afforded to him by the association, and devoted much of his time during the last year of his life to drawing up a valuable index to the numerous contributions to seismology scattered through seventy-two volumes of the association's reports. This index is now in type, and will be presented at the forthcoming Birmingham meeting. It may be hoped that on this occasion a means may be found for consummating the great aid which the association has always furnished to seismological science, by inaugurating an effort to place Milne's system of observation and research on a sound and permanent basis. It may be suggested that as a national system of meteorological observation has been evolved from the meteorological committees of the British Association, a national seismological scheme may, in like manner, be developed from the association's committees on the subject.

On August 8 a second letter appeared in *The Times* from the president of the Royal Society, strongly urging the importance of continuing Milne's organisation, and making it a national undertaking. Sir Archibald Geikie, besides bearing eloquent testimony to Milne's genius and enthusiasm as a scientific worker and his loveableness as a man, is able to quote from a letter just received from Prince Galitzin, the president of the International Seismological Association, in which it is asserted that Milne "through his most important investigations set seismology on a firm scientific basis, founded upon instrumental observation," that "he can duly be considered as the real founder and promoter of this new and important branch of geophysics," and that the continuation and development of his great work "would be the best monument to his memory."

J. W. J.

THE ULTIMA THULE OF POLYNESIA.¹

EASTER ISLAND, so called because of its discovery by the Dutchman Roggweeon on Easter Day, 1722, presents several as yet unanswered problems in ethnology and linguistics. One of these is the provenance of the gigantic stone statues found in the island, another the decipherment of the singular incised tablets which appear to show a form of writing or hieroglyph, though written characters are found nowhere else east of Java. A third problem, the origin and settlement of the present population, or rather of the generation which is now so rapidly passing, is less difficult, and is that which Mr. Churchill has set himself the task of investigating in the present volume.

In his former book on the Polynesian wanderings (see *NATURE*, September 21, 1911, p. 381), the author discussed the entry into the Pacific of the primitive Polynesians, whom he called the proto-Samoans, and their settlement in the region he defined as Nuclear Polynesia, comprising the island-groups surrounding Samoa, and including

¹ "Easter Island. The Rapanui Speech and the Peopling of South-east Polynesia." By William Churchill. Pp. iv+340. (Washington: Carnegie Institution of Washington, 1912.)

the Tonga and Viti clusters, with Rotuma, Uvea, and Fakaafo. He maintains that there was a later migration of the same race, the course of which into Polynesia cannot now be traced. These second comers he calls the Tongafiti, and regards them as having been so long separated from the proto-Samoan that their language had independently and divergently developed. But during the dominance of the Tongafiti in Nuclear Polynesia their speech had become mixed to some extent with the proto-Samoan.

After the expulsion of the Tongafiti from Samoa about the eleventh century of our era, they took refuge in the islands eastward, the Cook and Austral Islands, which became the centre of the migrations which ultimately reached Hawaii and New Zealand. This central region is not dealt with in Mr. Churchill's present work, and he defines the region discussed as "south-east Polynesia," comprising the Paumotu group with Mangareva, the Marquesan and Tahitian groups, and Rapanui or Easter Island.

Mr. Churchill's material for the examination of the languages consists mainly of the vocabularies collected by the French missionaries in Rapanui, the Marquesas, and Tahiti, with Tregear's vocabularies of Paumotu and Mangareva, also derived from French sources. All these lack, as Mr. Churchill notes, the fullness and detail of the Samoan, Tongan, and Maori dictionaries of Pratt, Baker, and Williams, for they start with an original list in French, for which their compilers have sought to ascertain the Polynesian equivalents.

Mr. Churchill's method in the present work is similar to that followed in the "Polynesian Wanderings." After a valuable discussion of the Polynesian alphabet, and of metathesis in Polynesian words, he deals with the sources and variety of Rapanui speech, deducing from its treatment of modern loan-words (European) its principles of deviation from the Polynesian standard. Then, by an examination of the Rapanui vocabulary, he proceeds to distinguish the words which occur (1) in both proto-Samoan and Tongafiti; (2) in proto-Samoan alone; and (3) in Tongafiti only. The first are called general Polynesian. In a table of 957 Rapanui words he refers 436 to general Polynesian, 110 to proto-Samoan (*i.e.* with cognates in Samoan), and 119 to Tongafiti (*i.e.* with cognates in Maori). But 292 words are restricted to south Polynesia alone, that is, have cognates only in Paumotu, Mangareva, the Marquesas, and Tahiti. He states that "the proto-Samoan element represents an older and more primitive type than is shown in the modern languages of Nuclear Polynesia," pointing to the migration from Samoa as having taken place whilst two aspirates were in use, and before the formative elements had been acquired which have enabled the language in Nuclear Polynesia to maintain the final consonant of a closed stem, as in Mr. Churchill's proto-Samoan stem *ikof*, which became *i'ofi* in Samoan and *iko* in Rapanui.

Paumotu is regarded as the "second station of

the Tongafiti migration after its expulsion from Samoa, and its centre of distribution to the seats of the present great settlements of this swarm." Mangareva is also dealt with as a centre of distribution, and the Marquesas as affording indications of their being in the fairway of the migration to Hawaii. All these are numerically dealt with, and their words classified as general Polynesian, proto-Samoan, and Tongafiti. A very important result appears in the statement that in the Paumotu vocabulary, whilst 52 per cent. of its words are cognate with the other Polynesian languages, 48 per cent. are found peculiar to Paumotu. Mr. Churchill regards these words as true Polynesian which have gone out of use, as Polynesian words are prone to do, or have been invented to express a new environment, and quotes Dr. Friederici on word-tabu and the theoretical formation of new words. Here two important facts seem to have been lost sight of. In other languages the words used as substitutes for tabu-words are *not* usually new inventions, else they would not be understood by the hearers, but are words really belonging to the languages, though not in general use. Similarly, unless a foreign word is introduced, a new object or action is named by a word already known. In the opinion of the present writer, the fact that the peculiar Paumotu words are totally unlike any others in the island region (except a few in the allied Tahitian) appears to show that they are not Polynesian at all, but rather a remnant of some pre-Polynesian speech.²

Mr. Churchill finds in the four languages discussed a wide speech-group of broad diffusion and of considerable complexity. He subdivides this into: (1) a Polynesian speech which has passed from the use and memory of other Polynesians; (2) a later proto-Samoan colony taking refuge from Tongafiti tyranny; (3) a Tongafiti settlement; (4) a migration of associated proto-Samoan and Tongafiti from the west which was caught in the Paumotu chain, only a few stragglers reaching the other groups; (5) from the Paumotus, part of a subsequent migration reached Rapanui, the last home of the Polynesians.

Apart from its theory, with all the interesting issues involved, Mr. Churchill's book has the very practical advantage of presenting in a convenient form Rapanui, Paumotu, Mangarevan, Tahitian, and Marquesan vocabularies, with an extremely useful finding-list in English and Rapanui. The student, whether in accord with Mr. Churchill's theory or not, will find it of much value as a record of the languages.

SIDNEY H. RAY.

THE SOUTH AFRICAN NATIONAL BOTANIC GARDEN.

THE work of the last session of the Union Parliament included the establishment of a National Botanic Garden at the Cape. This was the natural outcome of the cordial reception given in the House of Assembly to the resolution moved by Sir Lionel Phillips on May 6.

² *Cf.* Reports of Cambridge Anthropological Expedition to Torres Straits, vol. iii., p. 519 *et seq.*