

found in a ballast-pit opened by the Great Eastern Railway Company by the side of the line, about a mile and a quarter from Kennet Station, in the county of Suffolk. A reference to the Geological Map of the Ordnance Survey, Sheet 51, N.E., will show that the gravel in which this pit was opened is an extension of that which underlies the site of the above *surface* discovery. The implements from the ballast-pit which have come into my possession are of the kite-shaped and ovate types. Some are water-worn and abraded, in others the angles and edges are as sharp as if made yesterday.

ARTHUR G. WRIGHT

Sign-Numbers in Use among the Masai

AMONG the numerous tribes of Central Africa the Masai are distinguished by their use of finger-signs to denote numbers. These notorious warriors rarely ever use language to indicate numbers without accompanying signs on the fingers, though very frequently the latter are employed without the former, especially in answering questions.

As by some inadvertency I omitted giving a list of these signs in "Through Masai-Land," and Mr. Johnston, in his book "Kilimanjaro," has followed suit, it may still be of some interest and value to anthropologists to learn what these are.

English	Masai	Sign
1	Nabo	First finger held out alone
2	Aré	First and second fingers held out and alternately moved backwards and forwards
3	Uni	Thumb and two first fingers placed tip to tip
4	Unghwani	First and second fingers laid on top of each other
5	Umiēt	Thumb placed between first and second fingers
6	Ilé	Thumb scratched over nail of second finger
7	Nabishana	No finger indication
8	Usiēt	Hand held open and vertical and moved up and down
9	Naūdo	Thumb and first finger form a circle by joining the tips
10	Tomor	First finger drawn over the nail of the thumb
11	Tomoni-obwo	Same sign as in 10 accompanied by that for 1. The same rule for the succeeding numbers
20	Tikitung	The hand closed and opened rapidly
21	Tikitung-o-nabo	The same as 20, but followed by the sign for 1
30	Othman	First finger held out and shaken by a circular movement of the wrist
40	Artum	The hand held open and vertical and shaken or agitated by a circular movement of the wrist; not up and down as in 8
50	Unum	Thumb placed between first and second fingers, and hand agitated as in 40
60	Tomoni-ilé	Nail of thumb scratched on nail of third finger
70	Tomoni-nabi-hana	No finger indication
80	Tomoni-usiēt	Same as in 8, but sign never employed alone
90	Tomoni-naūdo	Same as in 9, but words always employed along with sign
100	Ipé	The partially closed hand opened once or twice
200	Ipé-aré	

JOSEPH THOMSON

A GLACIAL PERIOD IN AUSTRALIA

A GREAT many theories have been put forward to explain the extensive glaciation which repeatedly covered Europe and North America with enormous ice-streams. The ingenuity displayed by those who dealt with the subject was well worthy of the importance which attaches to the solution of the problem. However plausible some of the theories propounded may be, still

it seems premature to approach such a question until all the available evidence bearing on the subject has been brought together. The southern hemisphere has, up till very recently, revealed only a few, and not very important facts, regarding glaciation, and it is evident that glacier traces in that hemisphere must be of great importance to explain the cause of glaciation; whether we may suppose it to be cosmic or terrestrial. I think, therefore, that my discoveries of glacier traces in Australia may be of sufficient general scientific interest to warrant my giving a short account of them in this journal.

Dr. von Haast, in his excellent work on the "Geology of Canterbury and Westland (New Zealand)" gave a detailed account of the traces of an extensive glaciation in the Middle Island of New Zealand, together with a map, showing that at one time the glaciers on the western slopes of the Southern Alps in many places reached down to the sea, and that those which descended from their eastern flanks covered a large portion of the lowlands extending between the mountains and the coastline.

During my exploration of the central part of the Southern Alps I observed numerous old moraines and *roches moutonnées* in the area which, according to von Haast's map, had once been covered by glaciers. Particularly was I struck with the freshness of the striae, the scratches and grooves in the steep and rocky precipices on the sides of Milford Sound, that jewel of the Southern Alps.¹ Capt. Hutton, who examined some of the other sounds has not discovered any glacial traces there.²

Even now the glaciers in New Zealand reach down to 700 feet on the west, and to 2000 feet on the east side, which shows that New Zealand must be subject to a very different climate to that in similar latitudes—44°—in the northern hemisphere. Like Patagonia, New Zealand is at the present day to a certain extent *in a Glacial period*. The much greater extent of the prehistoric glaciers shows, however, that it is now by no means *at the height* of its glaciation.

Although a Glacial period was shown to have existed in New Zealand, there have not up to now been any definite statements regarding this subject in the mainland of Australia. The Rev. Tenison-Woods³ examined certain rocks in the Blue Mountains, an insignificant table-land to the west of Sydney, and came to the conclusion that these, which had been supposed to indicate ice-action, did not do so, and that in fact there was no evidence of a Glacial period in the Blue Mountains. Mr. Howitt⁴ came to a similar negative result regarding certain gravels and conglomerates, which according to others indicated glacial action. Griffiths,⁵ on the other hand, claims these and other conglomerates of Omeo and Gippsland as evidences of a Glacial period in Australia.

Prof. Tate⁶ described some striated rocks found near Adelaide, and Stirling⁷ has shown that there exist extensive traces of glacier action in certain valleys near Omeo.

I myself have,⁸ in several papers, published some of

¹ R. von Lendenfeld, "Der Tasmangletscher und seine Umgebung," *Ergänzungsheft No. 75 von Petermann's geographischen Mittheilungen*. "The Time of the Glacial Period in New Zealand," *Proceedings of the Linnean Society of N.S.W.* for 1885.

² F. M. Hutton, *Proceedings of the Linnean Society of N.S.W.* for 1885.

³ *Proceedings of the Linnean Society of N.S.W.*, vol. vii. p. 382.

⁴ *Quarterly Journal of the Geological Society of London*, vol. xxxv. p. 35.

⁵ "Evidences of a Glacial Epoch in Victoria," *Proceedings of the Royal Society of Victoria* for 1884.

⁶ Tate, Anniversary Address, *Transactions of the Royal Society of South Australia*, 1879-80.

⁷ T. Stirling, "Notes on some Evidences of Glaciation in the Australian Alps," *Proceedings of the Royal Society of Victoria* for 1885.

⁸ R. von Lendenfeld, "Official Report on the Exploration of Mount Kosciusko to the Government of New South Wales" (Sydney, 1885.) "The Glacial Period in Australia," *Proceedings of the Linnean Society of New South Wales* for 1885. "Report on an Exploration of Mount Bogong," *Proceedings of the Royal Geographical Society of Victoria* for 1886.