

for many years before reaching full conviction on the question of evolution. Nor is this surprising; no one can read the suggestive series of letters to Sir Joseph Hooker without realising how great and numerous were the "doubts and difficulties" through which the veteran botanist battled his way towards final acceptance of his friend's views. The publication of the Lyell correspondence showed that the author of the "Principles" at the time of the publication of the first volume was perfectly satisfied as to the truth of organic evolution; this has been insisted upon both by Huxley and Haeckel. Yet, while writing his second volume, Lyell fell so strongly under the influence of Cuvier (whose palaeontological work naturally fascinated him) that he not only rejected Lamarck's hypothesis, but at times seemed to hesitate about the evolutionary theory altogether. Again, no one reading Herschel's address to the British Association in 1845, in which the "Vestiges" is so severely handled, could realise the fact that in 1836 he was writing to his friend Lyell that he was satisfied that the principle of continuity was applicable to organic as well as inorganic nature. It is no disparagement to either of these great thinkers to admit that, while weighing carefully the arguments for and against evolution, they inclined sometimes towards one side and at other times to the opposite view, and, in the words of Darwin, underwent "endless oscillations of doubt and difficulty."

JOHN W. JUDD.

ANTHROPOLOGICAL RESEARCH IN NORTHERN AUSTRALIA.

ALL friends of anthropology will rejoice to learn that after an interval of some years Prof. W. Baldwin Spencer, F.R.S., has resumed his researches among the aborigines of Australia. The following particulars as to his work and his plans are extracted from a letter addressed to Mr. J. G. Frazer on September 13.

The Commonwealth Government of Australia is about to undertake measures for the settlement of the Northern Territory, and during the present year it sent a small party to make preliminary investigations in that region. The leadership of the party was entrusted to Prof. Baldwin Spencer. The members of the party went to Port Darwin, and from there across to Melville Island; then they returned to Port Darwin and travelled south about two hundred miles, after which they crossed the continent to the Gulf of Carpentaria. Amongst all the tribes examined by the expedition the belief in the reincarnation of the dead is universal, and the same is true of the notion that sexual intercourse has nothing, of necessity, to do with the procreation of children. "The latter fact," says Prof. Spencer, "is interesting because we now know that this belief exists amongst all the tribes extending from south to north across the centre of Australia." On the other hand, Prof. Spencer found among these northern tribes none of the *intichiuma* or magical ceremonies for the multiplication of the totems which form so important a feature in the totemism of the central tribes; nor could he discover any restrictions observed by the natives in regard to eating their totemic animals and plants. "The absence of *intichiuma* ceremonies," he adds, "is doubtless to be associated with the fact that the tribes in the far north live under conditions very different from those of the central area. They never suffer from drought or lack of food supply. This seems to show that the *intichiuma* ceremonies are a special development of tribes that live in parts such as Central Australia, where the food supply is precarious."

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In one or two tribes along the Roper River a very curious totemic system was discovered. Among these people a man must marry a woman of a particular totem, but the children take a totem different from both that of their father and that of their mother. For example, a man of the Rain totem must marry a woman of the Paddy-melon (a species of small kangaroo) totem, and their children are of the Euro (a species of kangaroo) totem. Again, a Porcupine man marries a Lizard woman, and their children are Bats. In these tribes each exogamous class has certain totems associated with it. Again, in these tribes the natives are convinced that the spirit children know into what woman they must enter, so that the offspring shall have the proper totem. Everywhere, too, among the tribes traversed by the expedition, the women and children believe that the sound of the bull-roarer is the voice of a great spirit who comes to take away the boys when they are initiated; but during the initiatory ceremony, when the boys are shown the *churinga* for the first time, they are informed that the noise in question is not made by a spirit, but by the *churinga*, or bull-roarer, which was used in the past by one of the mythical ancestors of the tribe. Lastly, Prof. Spencer could detect among these tribes no trace of anything like a belief in a supreme being. On the whole, he considers that, with minor variations, the beliefs of these northern tribes are closely similar to those of the central tribes.

Prof. Spencer hoped to start about November 1 for another expedition to Melville Island, the inhabitants of which he is particularly anxious to study, as they are hitherto practically uncontaminated by European influence. His intention is to reside among them until February. All anthropologists will look forward with keen interest to the publication of Prof. Spencer's fresh inquiries in this promising region. It is much to be regretted that his former colleague in research, Mr. F. J. Gillen, has been prevented by the state of his health from taking any part in these new investigations.

THE TAAL VOLCANO.

THE latest publication received from the Weather Bureau of the Philippines is entirely devoted to a violent eruption of the Taal Volcano, which took place on January 30 of this year. This volcano, which lies thirty miles south of Manila, is represented by a crater in a small island which rises from the centre of Lake Bombon. As this lake joins Taal in its activities it also must be regarded as an active crater. If its waters could be removed by the deepening of the channel of the river which now drains it, we should have a replica of Mount Aso, in South Japan, viz., a large crater about twelve miles in diameter with an active cone in its centre. The craters of these two mountains rank among the largest of which our world can boast, but they are by no means comparable with the largest in the moon. If, however, the crater plains of Taal and Aso could be lowered to the level on which these mountains grew, they would closely resemble many lunar volcanoes.

The written history of Taal commences in 1572. Since that time the volcano has been fifteen times in eruption, the last being that now under consideration. Often it has obliterated hamlets and villages round the lake, but its last effort has practically cleared out everything. The number of dead is given as 1335, but because so many were buried beneath the ash and mud the exact number will never be determined. Of all the inhabitants round the lake the only survivors appear to have been those who were absent from their

homes. It was exactly the same in 1888, when an innocent grass-covered mountain called Bandai, in Central Japan, blew away its head and shoulders and filled up a valley thirteen miles in length with mud and stones. It buried everything.

Now these calamities are not always such sudden visitations as is popularly supposed. Most, but not all, dogs growl before they bite. Bandai, although it had not erupted for more than a thousand years, gave premonitory signals. From time to time it rumbled and slightly shook. Krakatoa, before it blew three-quarters of an island to the four winds, and opened a red-hot mouth at sea-level to fight two oceans, issued signals of uneasiness. So it was with Taal. On January 27, 1911, it seems to have been the origin of 24 small shocks. Next day the number increased to 197, and on January 29, 113 were counted. What came next we are not told, but at 2 a.m. on January 30, Taal burst forth with terrific energy, and a roar was heard at a distance of 310 miles. A great black cloud crossed with flashes of lightning and illumined with explosions which may have been of

to find it "very peaceful, with puffs of white vapour succeeding each other at intervals of ten to thirty seconds." Nevertheless, as on that day the Observatory in Manila recorded 130 shocks, Father Masò thought "there was still ground for fearing a fresh outburst." The giant was evidently resting after his angry exertions. May he do so for many years, and when he dies the Philippines will gladly write R.I.P. above his head.

JOHN MILNE.

THE SOLAR PHYSICS OBSERVATORY.

IN April last a departmental committee was appointed to consider and report upon alternative schemes for transferring the Solar Physics Observatory, now at South Kensington, to Fosterdown (Caterham) or to Cambridge. The report of the committee has just been published as a Parliamentary paper (Cd. 5924).

The committee was composed of Sir Thomas L. Heath, Assistant Secretary of the Treasury (chairman), Mr. F. W. Dyson, F.R.S., Astronomer Royal, Dr. R. T. Glazebrook, C.B., F.R.S., director of the



FIG. 1.—Crater of Taal Volcano before the eruption (seen from the E.S.E.).



FIG. 2.—Crater of Taal Volcano after the eruption (seen from E.S.E.).

electric origin, but in a globular form, rose from the crater from which two or three times a deep red glow appeared.

Barographs at a distance of 242 kms. were greatly disturbed. An analysis of these showed that a depression had travelled at a rate of 112 miles per hour. This depression appears to have been formed by the inrush of air towards the hot volcanic throat. Between twenty-two and thirty-nine miles from this the fall amounted to 2 mm., or 0·8 inch. The inference is that near the mountain the inrush of air must have had a hurricane force and given rise to a real though short-lived tornado. Round the crater everything was "wiped out" or buried in mud. It was not "destruction," but "annihilation." No lava issued. It was Bandaisan over again, a hurricane or whirlwind had levelled houses, torn up trees or stripped them of their leaves and bark. With it all there may have been a *fiery cloud*, like that which issued from Mount Pelée and destroyed St. Pierre. Two days later Father Masò approached the volcano

National Physical Laboratory, and Prof. Arthur Schuster, F.R.S., chairman of the executive committee of the International Union for Solar Research, with Mr. F. G. Ogilvie, C.B., as secretary. The terms of reference were:—

To consider the alternative schemes for locating the Solar Physics Observatory at Fosterdown and at Cambridge respectively, and to report which of the two schemes is likely to secure the best results for an annual expenditure of approximately the same amount as is now incurred for the work done under the direction of the Solar Physics Committee.

The conclusions and recommendations of three members of the committee, viz. Sir T. L. Heath, Mr. Dyson, and Prof. Schuster, are as follows:—

We are of opinion that, on a balance of considerations, and especially having regard to the advantage to the progress of solar physics which may be expected to accrue from the establishment and support by the University of a real school combining the studies of solar physics and astrophysics, the Cambridge scheme is calculated to give