TEN KATE'S EXPLORATIONS IN WESTERN AMERICA.

AFTER devoting himself for a number of years to the special study of somatology, and also to the more general acquirements necessary for an ethnologist, Dr. H. Ten Kate, jun., born in La Hague, set out on different expeditions to study some tribes and nations *in natura*. He accompanied Prince Bonaparte to Lapland and Finland in the summer of 1884, and in the present year has undertaken an extensive trip to Surinam, aided by subsidies from a number of scientific societies. The expedition which he undertook through the south-west of the United States and the north-west of Mexico was performed in the space of about thirteen months, — from November, 1882, to December, 1883, — and resulted in many valuable discoveries and observations, described by him at length in his recent volume written in Dutch, 'Reizen en onderzoekingen in Noord-Amerika' (Leiden, *Brill*, 1885, 464 p., 8°), with map and two plates containing views, portraits of Indians, etc. Having reached the west through Texas and Arizona, he first paid a visit to Sonora, and the southern extremity of the Californian peninsula. He found there graves of the Pericú Indians, whose skulls and bones proved them to belong to a race anthropologically distinct from the Cochimi, and other tribes farther north in the same peninsula. He left that dry country to pass through Sonora again, and north to the Gila River, to the Mohave reserve on Colorado River, to central Arizona, to the Pápago and Apache-Tinné settlements in the same territory, to Zuñi and the Pueblos of New Mexico scattered along the Rio Grande. The aboriginal tribes last seen by him were the southern Utes and the tribes in the centre and the east of the Indian Territory. We easily understand that the space of thirteen months was but a short lapse of time, considering the immense area travelled over, and the large number of Indian tribes and other objects of ethnologic interest which came under his observation; but, in reading the long and interesting report, we must acknowledge that the traveller has made the best use of the opportunities offered him. There is an endless variety of remarks on botany, geology, zoölogy; on Indian dresses, customs, pictographs, color adjectives; on government, politics, history, and political economy of the countries visited. We also meet at times with a few pungent remarks on the traders, cowboys, politicians, and 'judges' in the far west, — observations which greatly help to brighten the narrative, and enhance the interest we take in it.

Several smaller articles auxiliary to this report were issued by Dr. Ten Kate before its appearance. Their purpose is to give scientific accounts of Indian craniums, bodily admeasurements, tribal names, etc.: they are written in French.

THE GLACIAL PERIOD IN AUSTRALIA.

IN a paper on this subject recently read to the Geological society of London, Dr. R. von Lendenfeld said, that, although several previous writers have suggested that bowlders and gravels found in different parts of Australia are of glacial origin, the evidence is vague, and no clear proof of glaciation has been brought forward. During a recent ascent of the highest ranges in Australia, — parts of the Australian Alps, — where he discovered a peak which he named Mount Clarke, 7,256 feet high, he found traces of glaciation in the form of *roches moutonnées* throughout an area of about a hundred square miles. The best preserved of the ice-worn surfaces were found in a valley named by the author the Wilkinson valley, running from north-east to south-west, immediately south of Müller's Peak and the Abbot Range. No traces of ice-action were found at less than 5,800 feet above the sea. The rocks showing ice-action are all granite; and the fact that the surfaces have been polished by glaciers is said to be proved by the great size of such surfaces, by their occurrence on spurs and projecting points, by many of them being worn down to the same general level, and by their not coinciding in direction with the joints that traverse the rock. Dr. von Lendenfeld's paper closed with a comparison of the evidence of glacial action in Australia with that in New Zealand.

Prof. T. G. Bonney considered that more evidence was necessary in order to establish the point contended for by Dr. von Lendenfeld. All his proofs were founded on granite, which had a constant tendency to form rounded bosses. The fact that the supposed *roches moutonnées* occurred on spurs, rendered the matter still more doubtful, seeing that in small glaciated tracts such surfaces were chiefly found in valleys. It was a remarkable, and to him a very suspicious, fact that no moraines or perched blocks were noticed: in fact, the only point of importance adduced in favor of the author's view seemed to be the difference in the direction of the joint-planes and of the rounded surfaces; and this he thought insufficient.

Mr. W. T. Blanford agreed with Professor Bonney, and mentioned examples of the occurrence in the plains of India, where glaciation was out of the question, of granite surfaces simulating *roches moutonnées*, and of larger dimensions than those cited by the author. It seemed to him not impossible that Dr. von Lendenfeld was right; but the evidence brought forward was certainly not sufficient. The circumstance most in favor of a glacial origin for the supposed *roches moutonnées* was their restriction to a particular elevation.

THE RECENT CHOLERA CONFERENCE IN BERLIN.

AT the recent cholera conference in Berlin, May 2–8, the principal disputants were Koch and Pettenkofer, the former asserting, and the latter denying, the specific character of the so-called 'comma' bacillus of cholera.

The following summary of the position of each, taken from reports that have just reached us, may be of interest to our readers.

Koch's grounds for his assertions he sums up as follows: 1. The constant occurrence of the bacillus

in seventy-nine cases of cholera examined in Calcutta. 2. He demonstrated pure cultures of the comma bacillus from France, Italy, and Germany, all exactly alike. 3. He considers it proven that this comma bacillus occurs only in cholera, may be differentiated from others similar to it, and is diagnostic of the disease. 4. He demonstrated inoculation experiments upon animals, as follows: —

Five cubic centimetres of a five-per-cent solution of sodic carbonate, and in twenty minutes ten cubic centimetres of meat-broth containing a pure culture of the comma bacillus, were injected into the stomach of each guinea-pig. Immediately afterwards laudanum (one centimetre for each two hundred grams weight) was injected into the abdominal cavity. This served to narcotize the animals for one-half an hour to one hour. The next day they were ill, with bristling hair, great weakness of the hind-legs and muscles of the back, and died in from one to three days. Section showed swelling of the intestinal glands, and the stomach and coecum full of an alkaline, colorless, flocculent fluid, containing almost a pure culture of the comma bacillus. This experiment was made upon eighty-five guinea-pigs.

Similar experiments were made with Finkler and Prior, and Denecke's bacillus, but in much smaller number. The results were very different, Finkler's bacillus producing putrefaction in the intestinal contents, as shown by their smell.

Therapeutic experiments upon the inoculated animals showed merely that large doses of calomel, or the use of naphthaline, would prolong the life of the animal for a day at most. The comma bacillus is easily destroyed by drying and other disinfectants, as by a one-half-per-cent solution of carbolic acid.

The observations upon man, considered by Klein and Macnamara to be of the nature of infection experiments, Koch took up again, and showed, that, of the one hundred and fifty physicians who took the 'cholera course' in Berlin, but one had cholerine, and comma bacilli were found in his dejections.

He has also found that the comma bacillus will live in well-water thirty days, in dirty canal-water seven days, twenty-four hours in the contents of a privy, three to four days in moist linen, eighty-one days in the harbor-water of Marseilles (Nicati and Rietsch), and more than one hundred and forty-four days on agar-agar. Koch has never found any *resting* form at all like the spore stage of some other bacteria.

Pettenkofer confessed himself not convinced. He said the inoculation experiments were unsatisfactory. Those made with Emmerich's short staffs at Naples and at Munich were much more so. The manner in which Koch inoculated his animals threw no light upon the subject, for only man had the disease. He cannot agree that the comma bacillus is more than a usual accompaniment of cholera. The epidemiological knowledge of cholera is to be completed by considering the comma bacillus its cause, — a difficult thing to prove, since drying kills this organism; and yet in lower Bengal a dry year is notoriously a favorable one for the disease.

The comma bacilli are found only in the intestines, not in the organs; and yet the intestinal glands are highly absorptive. Cholera is not a combination of infection and intoxication, but an infectious disease, pure and simple. It is possible that in the future Emmerich's staffs may be found to be the cause of the disease. These are found in the organs of the inoculated animals, and produce cholera-like vomiting and diarrhoea. Before fully accepting the bacillus, more must be known of the epidemiology of the disease. Since cholera is not communicated directly, so the cholera-germ is not; and, since cholera depends upon place and time, the cholera-germ must be governed in the same way.

ROLLESTON'S LIFE AND WORK.

Rolleston's worthiest memorials are the growing school of biology at Oxford, and the important zoölogical and anthropological collections of its university museum. His remarkable energy, however, enabled him not only to do his work as a teacher, and take the part of a leader in university politics, but to add to knowledge by investigations in many subjects. His original papers, dealing with topics pertaining to anatomy, physiology, zoölogy, archeology, and anthropology, are scattered over the pages of different journals, and the reports and transactions of various societies. It is well that some of his friends have collected these scattered writings, and secured their republication in the volumes before us. Professor Turner of Edinburgh has edited them; and Prof. E. B. Tylor of Oxford has added a brief biography, which is full of interest as giving a clew to the source of the remarkable influence which Rolleston was able to exert in favor of natural science, at a time when the traditions, and the preponderance of the sentiment of his university, were against such studies.

Rolleston's father, vicar and chief land-owner of a small Yorkshire parish, was a good classical scholar, and undertook the primary education of his son, who, it is said, was able to translate Homer at sight when only ten years of age. The lad had, from the first, something of the tastes and instincts of the naturalist: he read Izaak Walton, and Gilbert White's ever-charming 'Selborne,' and in his play-hours mounted the skeletons of mice and weasels, and stuffed the skins of birds and beasts of the neighborhood. After subsequent years at school, he won a classical scholarship at Pembroke college, Oxford, and began residence in

Scientific addresses and papers. By George Rolleston, M.D., F.R.S., Linacre professor of anatomy and physiology, and fellow of Merton college. 2 vols. Oxford, *Clarendon press*, 1884. 76+947 p., portr., illustr., 5 pl. 8°.