

organisms are Bacilli, which bear most resemblance to the *anthrax* Bacilli, but not smaller; (3) they are found in the blood, lungs, heart, and nervous tissue of persons dying of the disease; (4) they can be reared independently; (5) the Bacilli, which can live as parasites in the human organism, can also live and multiply out of it. These facts, which are said to be established by the investigations, explain how *beri-beri* patients can infect particular places, and how healthy individuals coming from uninfected places contract the disease in infected ones.

MR. W. H. BEEBY has reprinted from the *Scottish Naturalist* some interesting notes on the flora of Shetland. They are the result of a visit of about eight days to the Shetland Islands at the latter end of July last. Four distinct districts were visited, the greater amount of time being spent in Unst. Mr. Beeby is of opinion that the flora of the Shetland Islands is well worthy of further attention. An explorer would, he thinks, be rewarded by finding plants which are at present known only in the Faroes and in Scandinavia.

THE contents of Part 2, No. 3, of vol. lv. of the Journal of the Asiatic Society of Bengal include a short paper by Dr. King, on two new species of holly from the Eastern Himalayas, but are otherwise purely entomological. Prof. Forel continues his critical examination of Indian ants in the Calcutta Museum. Mr. de Nicéville describes nine new species of Indian butterflies, chiefly from Sikkim (which are to be figured in a succeeding number). Mr. Doherty, of Cincinnati, U.S.A., communicates a paper on new or rare Indian butterflies, many of which are from the Nicobar Islands; and Mr. E. T. Atkinson, President of the Society, gives a compilation of what has been written concerning Indian Coccidæ, which may be taken as an introduction to the study of this obscure and injurious family of insects in India. The author has chiefly followed Signoret in the systematic arrangement. The collected information will prove useful in India, for some of these scale-insects have been most destructive to coffee and other plantations. Having a clue as to how and what to observe, Indian entomologists will, no doubt, soon show that legions of Coccidæ exist in India, as elsewhere, and many strange forms will be detected.

THE additions to the Zoological Society's Gardens during the past week include a Gray Ichneumon (*Herpestes griseus*) from India, presented by Mr. C. F. Hird; a Golden Eagle (*Aquila chrysaetus*) from Scotland; a Chilian Sea-Eagle (*Geranoæetus melanoleucus*) from South America; a Brazilian Caracara (*Polyborus brasiliensis*) from Brazil, presented by Mr. C. Czarnikow; a Bronze-winged Pigeon (*Phaps chalcoptera*) from Australia, presented by Mr. Malcolm Nicholson; two Red-crested Cardinals (*Paroaria cucullata*) from Brazil; two Cockateels (*Calopsitta nove-hollandiæ*) from Australia, presented by Colonel F. D. Walters; two Crested Newts (*Molge cristata*), presented by Mr. Alban Doran; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa; two Blue-fronted Amazons (*Chrysotis astiva*) from South America, deposited; a Hog Deer (*Cervus porcinus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

TELEGRAPHIC DETERMINATION OF AUSTRALIAN LONGITUDES.—A "Report on the Telegraphic Determination of Australian Longitudes," signed by Messrs. Ellery, Todd, and Russell, has recently been published by the Government of South Australia. This Report contains the final results of the operations connecting Singapore and Port Darwin, carried out in 1883 by Capt. Darwin, R.E., in concert with the Australian astronomers above mentioned. The Observatories of Melbourne, Sydney, and Adelaide were subsequently connected with Port Darwin. The preliminary results of these telegraphic longi-

tude determinations were communicated by Mr. Todd in 1883 to Sir G. B. Airy, and published in the *Observatory* for October of that year. The longitude of Singapore adopted in forming the results given in the Report before us is that determined by Commander Green, U.S.A., in 1882, viz. 6h. 55m. 25.01s. East of Greenwich (for Capt. Darwin's station), assuming that of the Madras Observatory to be 5h. 20m. 59.42s. Hence the resulting longitudes are:—

		h.	m.	s.
Observatory, Port Darwin	...	8	43	22.49
" Adelaide	...	9	14	20.30
" Melbourne	...	9	39	54.14
" Sydney	...	10	4	49.54
" Wellington, N.Z.	...	11	39	6.52
" Hobart	...	9	49	19.80

The observations for the purpose of connecting Singapore with the various points in Australia are given in sufficient detail in the Report to enable us to see that the determinations have been made with care and attention to detail, and appear to be deserving of every confidence. The New Zealand and Tasmanian results may perhaps require further correction.

COMETS AND ASTEROIDS.—Prof. Daniel Kirkwood has a brief note in the *American Journal* for January 1887, on the origin of comets, in which he points out the probability that two, at least, of recent short-period comets have had an origin in the zone of asteroids. Tempel's comet (1867 II.) has a period, inclination, and longitude of node approximately the same with those of Sylvia (Minor Planet No. 87), whilst its eccentricity is but little greater than that of Æthra (No. 132). Wolf's comet (1884 III.), before its last close approach to Jupiter, had an eccentricity which was exceeded by twelve known minor planets; its period was about 3619 days, and its mean distance 4.611, so that it would appear to have been simply a very remote asteroid. Its period was very nearly commensurable with that of Jupiter.

THE TAILS OF THE COMETS OF 1886.—Prof. Th. Bredichin has recently examined the curves of the tails of the three principal comets of last year in connection with his well-known theory as to the laws of formation of the tails of comets. The two first comets, those of Fahry and Barnard (1886 I. and II.), proved difficult to observe, the earth being nearly in the plane of the orbit of the former comet, so that the foreshortening greatly increased the errors of observations, whilst the tail of the latter was very short, and was diffused on one side. Both, however, were of the same type, the second, $1 - \mu$ being found to be equal to 1.3 for the first, and 1.9 for the second. The third comet referred to, that discovered almost simultaneously by Mr. Barnard and Prof. Hartwig, proved much more important for the purposes of Prof. Bredichin's theory, since it showed three tails. Of these the principal one plainly belonged to the first type, a value of 17.5 for $1 - \mu$ satisfying the observations very fairly. The shorter tail seen by a number of observers plainly belonged to the third type, $1 - \mu$ being very small, whilst a third tail, seen by Mr. Backhouse (*NATURE*, January 6, p. 224), and lying between the other two, evidently belonged to the second type.

MINOR PLANET No. 265.—M. Bigourdan points out (*Comptes rendus*, vol. civ. No. 9) that the motion of R.A. of this body is unusually rapid, amounting to $-1m. 40s.$, or double the ordinary value for the other asteroids. As the planet is nearly exactly in opposition, it must be relatively near the earth, and may therefore be very advantageously employed in the future for the determination of the solar parallax.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 MARCH 20-26

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on March 20

Sun rises, 6h. 5m.; souths, 12h. 7m. 37.7s.; sets, 18h. 11m.; decl. on meridian, $0^{\circ} 10' S.$; Sidereal Time at Sunset, 6h. 3m.

Moon (New on March 24) rises, 4h. 30m.; souths, 9h. 10m.; sets, 13h. 57m.; decl. on meridian, $15^{\circ} 39' S.$

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	5 48 ...	12 13 ...	18 38 ...	4 10' N.
Venus ...	6 51 ...	13 43 ...	20 35 ...	9 22 N.
Mars ...	6 22 ...	12 38 ...	18 54 ...	2 27 N.
Jupiter... ..	21 18* ...	2 22 ...	7 26 ...	11 42 S.
Saturn... ..	11 7 ...	19 16 ...	3 25* ...	22 30 N.

* Indicates that the rising is that of the preceding evening and the setting that of the following morning.

March	h.	
20 ...	22 ...	Sun in equator.
22 ...	3 ...	Mercury in inferior conjunction with the Sun.

Variable Stars

Star	R.A. h. m.	Decl. ° ' N.	h. m.
Algol	3 0'8 ...	40 31' N.	Mar. 20, 4 36 m
ζ Geminorum ...	6 57'4 ...	20 44' N.	23, 1 25 m
U Monocerotis ...	7 25'4 ...	9 33' S.	25, 2 14 m
S Cancri	8 37'5 ...	19 26' N.	25, 19 0 M
U Hydræ	10 32'0 ...	12 48' S.	21, 22 42 m
δ Libræ	14 54'9 ...	8 4' S.	22, m
U Coronæ	15 13'6 ...	32 4' N.	23, 22 47 m
U Ophiuchi... ..	17 10'8 ...	1 20' N.	24, 1 1 m
		and at intervals of	20 8
W Sagittarii ...	17 57'8 ...	29 35' S.	Mar. 25, 23 0 m
β Lyræ... ..	18 45'9 ...	33 14' N.	21, 23 0 m
			25, 4 0 M
η Aquilæ	19 46'7 ...	0 43' N.	25, 22 0 M
R Aquarii	23 38'0 ...	15 55' S.	26, M

M signifies maximum; m minimum.

Meteor-Showers

Near 55 Aurigæ, R.A. 98°, Decl. 45° N.; and on March 20, near θ Ursæ Majoris, R.A. 145°, Decl. 48° N.

GEOGRAPHICAL NOTES

OXFORD has decided to establish a Readership in Geography; candidates are invited to apply. Cambridge has postponed taking a similar step till 1888. While on this subject we may state that by a new Imperial ordinance geography has been raised to an equal footing with the most important subjects taught in German middle-class schools — *Realschulen* and *Gymnasien*. The programme for the examination of teachers desiring to make this one of their special subjects has been issued. There are three grades, and the standard in each is very high.

ACCORDING to advices received at Zanzibar from Uganda, Dr. Junker's caravan safely reached Emin Pasha, who was in good health. Intelligence has also been sent to Zanzibar that five months ago Emin Pasha visited Uganda, but that King M'wanga refused to allow him or his followers to pass through his territory. Emin Pasha then attempted to make arrangements for his passage through Karagwa, on the western shore of the Victoria Nyanza, but failed in this also, and afterwards returned to Wadelai, leaving a detachment of soldiers at Unyoro under the command of Capt. Casati, Emin Pasha's sole European companion.

WE learn on the best authority that Mr. Stanley, on his arrival at Stanley Falls with the first contingent of his Expedition, about 250, will proceed at once to Emin Pasha, without waiting for the rest of his party. No doubt he will be reinforced by some of Tippoo's men, and in this way there will not be a moment's delay. The main body will follow as soon as steamers are able to land them all at Stanley Falls, but first a camp will be established at some distance from the Falls as a base of operations. Dr. Junker gave an account of his seven years' exploring work, on February 26, to the Cairo Geographical Society. His magnificent maps were shown, one of them measuring 13 feet by 23 feet. Dr. Schweinfurth maintained the absolute accuracy of Junker's maps in all respects. Junker then gave a detailed account of his sojourn in the Niam-Niam country. Here he found extensive fertile plains, veritable savannahs, with grass over 3 feet high, and abundance of game. He then passed on to his exploration of the Wellé and the

Mepoko, to within four days' journey of the Congo, concluding by giving some interesting details of the effect of the Mahdi revolt on these countries.

THE well-known African traveller, Dr. Zintgraff, who has been commissioned by the German Government to explore the Cameroon district, intends visiting the Cameroon Mountains. As large quantities of caoutchouc are said to be obtained there, Dr. Zintgraff will be accompanied by an expert in that material.

AN official publication of the Colonial Office (African, No. 332) contains a great deal of original information regarding the different districts and tribes of Sierra Leone and its vicinity.

ON Monday evening last a paper on "The Alpine Regions of Alaska" was read by Lieut. H. Seton-Karr at a meeting of the Royal Geographical Society. In the course of a description of a visit to this territory last year, the reader expressed the opinion that the St. Elias Alpine region offers one of the best places for the study of glacial phenomena under the most powerful conditions. According to Dall, the American surveyor, Mount St. Elias is 19,500 feet high. It is a mass of snow and ice from base to summit, and has always been marked in modern maps as exactly on the 141st meridian, which is the boundary line. If the shore line was correctly charted, he found that the summit was east of the meridian of longitude mentioned. It was therefore in the British Empire. Describing the ascent of the mountain, he stated that he proceeded to a point which the aneroid instruments gave as 7200 feet above the sea-level. There remained in the Alpine regions of the North Pacific a wide field for explorers. Mounts Crillon, Fairweather, and La Pérouse, respectively 15,900, 15,500, and 11,300 feet high, were not quite so striking as the one he described, but were much nearer to civilised settlements. There is a large blank space upon the map of Alaska, lying between Cook's Inlet and the great Yukon River. It is as unknown as any of the unexplored regions on the globe.

A JOURNEY of considerable interest is now being carried out in Central Asia by Mr. A. D. Carey, of the Bombay Civil Service. Mr. Carey left India in May 1885, and marched through Ladak into Northern Tibet (Chángtán) as far as the Mangtsa Lake, and then struck northward, descending on the plain of Turkestan, near Kiria. He thus traversed over 300 miles of country which had never before been visited by a European. The altitudes on this section of the journey were always very great, the track running usually at about 16,000 feet above the sea, while one at least of the passes crossed was calculated to reach 19,000 feet. After a stay at Kiria and Khotan, the Khotan River was followed to its junction with the Tarim; the route then lay along the latter river to Sarik, and then across a stretch of desert to Sháh-Yarand Kuchár. From the latter place the Tarim was followed down to a point where it turns southward towards Lake Lob. From this point the towns of Kurla and Kárastaber were visited, and about the end of the year the Tarim was struck again and tracked down to Lake Lob. Thus the whole length of the Tarim has been explored. The country along its banks is described as flat and reedy, and the people extremely poor and miserable. Mr. Carey pitched his camp at the village of Cháklik, some distance south of the lake, and close to the foot of the great range of mountains which forms the northern scarp of the Tibetan highlands. On April 30, 1886, Mr. Carey started from this village on a journey southward into Tibet, over a pass in the Altyn Tagh Range, and onward by a track occasionally used by the Kalmucks. Since this start nothing has been heard of Mr. Carey, but it is presumed that after spending the summer and autumn in travelling over the elevated region he has returned to Turkestan to winter.

THE principal paper in the March number of *Petermann's Mitteilungen* is a special study of the basin of the Cachapool in the province of Santiago, Chili, by Dr. A. Plagemann. There is also a short paper on the hydrography of Batanga Land, by Herr P. Langhaus. From the notes we are glad to learn that the Roumanian Government has adopted a plan for the triangulation of that country, which will be the means of filling up an important gap in the cartography of Europe. *Ergänzungsheft* No. 85 of *Petermann's* contains a detailed account, with map and diagram, of Dr. Gustav Radde's journeys in the Alpine region of Daghestan in the summer of 1885.