

has been made with some zoological collections; the aquarium, however, has proved a failure, and the vivarium labours under the disadvantage of never being reached by the sunlight. Several short and interesting papers are published with the report.

THE Russian Government has sent an official of the Education Department to Vienna to study the State commercial and industrial schools of Austria, these establishments being regarded as models, and the Russian Government intending to organise similar ones.

THE Fish Culture Department at the International Inventions Exhibition has proved a great success and attracted a large concourse of visitors. During the past week many important additions have been made, including a magnificent model of a Fish Culture Establishment exhibited by Mr. T. J. Mann, and a series of oyster beds, demonstrative of the process of breeding and fattening oysters. A special feature has been made of oysters this year in the Aquarium, where they are to be seen in numerous varieties imported from various quarters of the globe. In close proximity to them are exhibited various dredges and implements used in this particular fishery.

THE Count Lütke Medal of the Russian Geographical Society has been awarded this year to a work which deserves a special notice. It is Prof. N. J. Zinger's work on the determination of time by means of corresponding heights of different stars (translated in German by H. Kelchner, and published at Leipzig with a preface of O. W. Struve, under the title: "Die Zeitbestimmung aus correspondirenden Höhen verschiedener Sterne.") The determination of time with great exactitude, for telegraphic determinations of longitudes, by means of easily transportable instruments, has already occupied the Pulkowa astronomers. W. Struve and W. K. Döllner proposed very skilful methods of observations. The latter had proposed to determine the time by means of a special Repsold's circle from two passages of two stars in the prime vertical. The exactitude reached by this means was from 0.05 to 0.06 of a second; the circle had to remain in an unaltered position for no more than five or six minutes; but the whole observation took about forty minutes. Prof. Zinger's method, which is a further development of the work begun by Maupertuis, Olbers, Hauss, Delambre, and Knorre, consists in making two successive observations of two stars chosen for that purpose, at the same altitude, by means of any instruments which may not be divided with great perfection, but whose level would only show the changes the telescope may undergo when directed on two different azimuths. This method was met first with some coolness, on account of the difficulty of finding two stars which would culminate soon after one another at the same altitude. But M. Zinger has shown that even with a moderate telescope it is easy to have two stars easily found and pretty well seen at daylight which pass at the same altitude at an average of no more than nine minutes one after another. His tables render the task of finding such stars very easy, there being in moderate latitudes no less than 160 pairs of stars appropriate to that purpose. As to the ease and accuracy of the method, it is sufficient to say that time is determined with a probable error of no more than 0.04 of a second in no more than half an hour, without even making use of the divisions of the Repsold circle, and with only one reading of the microscope. For several years Prof. Zinger's method has been submitted to a very extensive test by Russian astronomers. So we learn from Gen. Kovarsky's analysis of it, published in the last "Annual Report" of the Geographical Society, that, when determining by means of light-signals the difference of longitudes between Pulkowa and Parlovska, and using a very plain instrument prepared by M. Brauer on M. Zinger's principles, the difference has been determined with an error of only one-fiftieth of a second. M. Pyertsoff, in Mongolia; Gen. Stebnitzky, in the

Caucasus, who considers the determinations of time from corresponding heights of two stars quite as accurate as that deduced from zenithal distances taken with a Repsold circle, but far shorter and easier; the Russian officers in Bulgaria, who have determined with telegraphic signals the longitudes of thirty-seven places in less than seventy evenings, spending no more than three hours each evening for a determination which gave the longitude with an error of only 0.04 to 0.02 of a second; the measurements around Omsk in 1878; those of M. Gladysheff in the Transcaspian, and of M. Mionczyorski on the Ural in 1882-84—all these have been made on the same method of Prof. Zinger, which has now become the most familiar one with Russian astronomers. The measurements are usually made with a Repsold's circle, which is ready for work half an hour after the astronomer has arrived at the place whose longitude he proposes to determine; and in chronometrical expeditions five minutes to a quarter of an hour of a bright sky give the possibility of measuring the longitude with an accuracy quite sufficient for geographical purposes.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mr. James Fleming; a Common Badger (*Meles taxus*), British, presented by Mr. C. Ethelstone Parke; a — Wild Ass (*Equus taniopus* ♂) from the Island of Diego Garcia, Chagos Archipelago, presented by Mr. F. D. Lambert, jun.; a Common Squirrel (*Sciurus vulgaris*), British, presented by Mrs. G. A. Smith; four Red-faced Weaver Birds (*Poudia erythroptus*) from South Africa, a Grenadier Weaver Bird (*Euplectes oryx*) from West Africa, presented by Mrs. Herman Kuhne; a Dominican Kestrel (*Tinnunculus dominicensis*), a — Bittern (*Ardetta* —), three Martinican Doves (*Zenaidra martinicana*), two Moustache Ground Doves (*Geotrygon mystacea*), a Tuberculated Iguana (*Iguana tuberculata*) from the West Indies, presented by Dr. A. P. Boon; two Harvest Mice (*Mus minutus*), British, presented by Mr. G. W. Oldfield; two Demeraran Cock of the Rocks (*Rupicola crocea* ♂ ♂) from Demerara, presented by Mr. T. C. Edwards-Moss; two Mute Swans (*Cygnus olor*), British, presented by Mr. J. W. Gibson; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Master C. A. Greeven; three Common Vipers (*Vipera berus*), British, presented by Mr. W. H. B. Pain; four White-faced Tree-Ducks (*Dendrocygna viduata*), a White Gannet (*Sula piscata*) from Brazil, deposited; a Dark Green Snake (*Zamenis atrovirens*), South European, purchased.

#### GEOGRAPHICAL NOTES

THE following message from Col. Prjevalsky, dated Lob Nor, March 15 (probably O. S.), is published in the *Invalide Russe*:—"During the last autumn and winter we visited Eastern Zaidam as far as Lob Nor. The middle range of the Kuen Lun, hitherto unknown, has been examined with sufficient care. The ancient route leading from Khoten to China has been found and thoroughly explored. We have also discovered three enormous snow peaks, to which we have given the names of Muscovite, Columbus, and Enigmatical. The most elevated point of the first-named is Mount Kremlin, of the second Mount Djini, and of the third the Crown of Monomachus, which are all of a higher elevation than 20,000 feet above the sea. The Thibetan plateau, skirting the middle Kuen Lun, has an average height of 4000 feet. No inhabitants were met with except in the Southern Zaidam. Further to the west the flora and fauna of the desert are extremely poor. In the month of December the cold was so intense that the mercury froze. We passed the month of February and the first fortnight of March at Lob Nor. We are just about to set out again, with the intention of crossing Cherchen, for the purpose of reaching Kiria, in the district of Khoten. During the three months of summer we shall traverse Northern Thibet, if the Chinese do not oppose us, and in the autumn we shall return to our own Turkestan. We are all in good health."

THE last issue of the *Izvestia* of the Russian Geographical Society (1885, 1) contains a very interesting paper, by M. Lessar, on "South-Eastern Turcomania," with a map, thirteen miles to an inch, of the region between Merv and Herat. This paper consists of a chapter on the occupation of Merv; a diary of the journey from Fol-otan to Penj-deh and in the Steppes; a geographical sketch of South-West Turcomania; and a translation of Sir Henry Rawlinson's note, by which M. Lessar's account of his first journey was accompanied in the *Proceedings* of the Royal Geographical Society, with a few remarks by the author. Capt. Abbot's remarks on South-West Turcomania and the Badhyz are also translated in an appendix. The geographical description of the region comprised between the oasis of Merv, the Murghab, the Borkhut mountains, and the Hari-rud, which region is described as "South-Western Turcomania," is especially worthy of notice, as a valuable contribution to the geography of the region.

THE Government of India has decided to appoint Mr. Ney Elias, one of the most distinguished of our Chinese travellers, and at present English Commissioner in Ladakh, to act as British Consul at Yarkand and Kashgar.

MR. HOLMAN BENTLEY sends to the *Times* news of the safe return of the Rev. G. Grenfell, F.R.G.S., in the Baptist Missionary Society's steamer the *Peace*, after a voyage on the Upper Congo River from Stanley Pool to Stanley Falls, a distance of 1060 miles. He has explored many of the tributaries on the way—the Mobangi to 4° 30' N. lat., the Ukere to 2° 50' N., and the Lubilanj to 1° 50' S. The Mbura is navigable only for ten or twelve miles from its junction with the Congo, when cataracts bar the way. The Mobangi is a fine river, but the people are very wild.

In a recent number of *Das Ausland*, Herr Habenicht, of Gotha, makes an important suggestion with regard to observations in Africa. He points out the dearth of accurate observations in latitude, longitude, and heights in the interior of that continent. For instance, with regard to the greater part of North Africa we are dependent on those of Vogel and Barth, while in South Africa those of Livingstone are almost the only ones we have. Even in the interior of the Cape Colony, the Orange Free State, the Transvaal, Namaqualand, the Kalahari desert, our knowledge of exact positions is still in the air. More is known of the central and lower Congo and the coast. To remedy these defects, Herr Habenicht proposes to geographical societies interested in African exploration that the field should be subdivided. Young men should be trained to make astronomical observations, barometrical measurements and itineraries, and two should be despatched on each route with separate sets of instruments. The routes suggested are the following: (1) Cape Town, through Stellaland, to the Zambesi; (2) Delagoa Bay to Stellaland; (3) Cape Town, through Namaqualand and Damaraland, to the Zambesi; (4) Loango to Zanzibar; (5) Zanzibar to the Egyptian Soudan; (6) the Lower Niger, through Darfur, to Khartoum; (7) the Gold Coast to Timbuctoo; (8) Morocco to Timbuctoo; (9) Tripoli to Socoto; (10) Bengazi, through Kufra and Borgu, to Kuka. All previous explorations, he says, would by these observations receive a sound scientific basis.

M. RADDE, the Director of the Natural History Museum at Tiflis, has been ordered by the Russian Government to investigate the mountain systems of the border-lands of Trans-Caucasia and Khorassan, between Ararat and Ala Dagh on the west and Elburz on the east.

FROM a report addressed by Col. Feilberg to the Argentine Minister of Marine on the subject of his mission to explore the Pilcomayo River, it appears that this stream is only navigable for eighty leagues from its mouth in the Rio Paraguay up to its confluent, the Rio Dorado. Five miles higher the rapids commence; there is then only two feet of water, the channel is narrow and very tortuous, and the current swift. The upper waters are lost in marshes, which the traveller crossed. On returning, the water had fallen considerably, and the journey was only accomplished with much trouble and after many accidents. During his stay on the Chaco he reports that he did not see a single Indian, although their tents were still standing in places. One of his officers had been sent with the chronometers to Corientes, to compare them by telegraph with the Observatory of Cordoba or Buenos Ayres. These comparisons are essential for the verification of the observations made, and as soon as

they have been obtained, the maps which are to accompany the publication of the journal of the mission will be commenced.

ACCORDING to the *Colonies and India* a conference took place on March 31, by telegraph, between the Melbourne and Sydney branches of the Geographical Society of Australia, on the question of New Guinea exploration. It was decided to subsidise Mr. H. O. Forbes's expedition, to the extent of 500*l.*, on condition that the two Colonies receive copies of the explorer's diary and despatches, and duplicates of his collection of specimens. The Conference also decided to send an independent expedition from the Aird River, the whole expenses to be defrayed by the Society. The expedition will be placed under the leadership of Capt. Everell, who will be accompanied by Herr von Leudenfelt.

THE Report on the trade of Persia by our Consul at Teheran, which has just been laid before Parliament, contains some interesting statistics on the population of Persia, in order to judge how far the country has recovered from the effects of the great famine of 1871-72. The area of the dominions of the Shah is 1,647,070 square kilometres, and the population is estimated at 7,653,000, contained in 99 towns with a total population of 1,963,800, while the villages and rural districts contain 3,780,000, and the nomads are estimated at 7,909,800. It is curious to notice how the number of nomads are made up: the Arabs number 52,020; Turks, 144,000; Kurds and Leks, 135,000; Beluchs and gipsies, 4,140; Bakhtiaris and Lurs, 46,800. The statistics of the creeds are: Sheeahs, 6,860,600; Sunnis and other Mohammedan sects, 700,000; Parsees, 8,000; Jews, 19,000; Armenians, 43,000; Nestorians and Christians, 23,000. Of the Armenian population 52.8 per cent. are males and 47.2 females. Of the Mussulman population the mean proportion is 50.5 per cent. females and 49.5 males. The following is a list of some Persian towns with their respective populations:

Tabreez ... ..	164,630	Zenjan ... ..	24,000
Isphahan ... ..	60,000 to 70,000	Cazoin ... ..	40,000
Yezd ... ..	40,000	Resht (including ad-	
Kerman ... ..	41,170	joining villages) ...	40,000
Shiraz ... ..	30,000	Astrabad ... ..	10,000
Shuster ... ..	under 20,000	Nishapore ... ..	11,000
Dizful ... ..	25,000	Sebzavar ... ..	12,000
Burujird ... ..	20,000	Meshed ... ..	60,000
Kermanshah ... ..	30,000	Kashan ... ..	30,000
Hamadan ... ..	30,000	Koom ... ..	20,000
Maragha ... ..	13,250	Mianeh ... ..	7,000
Soujboulak ... ..	5,000	Mohammera ... ..	15,000

Mr. Dickson, taking the medium between the highest and lowest figures he has obtained, estimates the population of Teheran at about 120,000, while Col. Ross estimates that of Bushire at 70,000.

In *Astron. Nachr.*, vol. cx., Prof. Dr. Auwers has published the results of his researches and calculations about the longitude of some places in Australia. Since these data will have to be altered by the result of the determination of the difference in longitude between Port Darwin and Banjuwangi (Java) we may omit particulars and only state that Mr. Auwers has found to be:—

		h.	m.	s.
Longitude of Sydney ... ..		10	4	49.75
„ Windsor ... ..		10	3	20.92
„ Melbourne ... ..		9	39	54.32
„ Adelaide ... ..		9	14	20.57

INFORMATION has been received in Berlin of the death, in the Cameroons, of Lieut. Tilly, the leader of another German expedition sent out to explore that part of Africa.

A PARLIAMENTARY paper just issued (Commercial, No. 5, 1885) contains an exhaustive report, by Vice Consul Comberbatch, on the Dobrudja. Under the head of geography it refers to the name, limits, frontiers, area, topography, division, mountains, forests, mines, rivers, marshes, lakes, islands, harbours, and tides of the district. This is succeeded by sections on the climate, history, ancient remains, population, sanitary state, government, public works, religion, education, agriculture, commerce, industries, navigation, natural history, and principal towns. The report, which occupies fifty pages, is thus a short treatise on this district at the mouth of the Danube, of which much was heard in connection with political events a few years ago.