

history put before him,—as a general rule, nothing more than the elements would be required; (2) that this should be done so as to make it as interesting to him as possible, so that he may look forward to his natural history lesson; (3) that if he “takes” to any particular subject, means should be at hand to enable him to go on with it; (4) that he should be encouraged to work out of school. Mr. Preston is of opinion that the appointment of “science masters” is not necessary for the attainment of these ends. “Among any body of masters now,” he says, “there are sure to be some who are fond of some branch of natural history, and who can teach the elements of their subject (as far as is necessary for boys in general), and do it in a pleasing and interesting manner. At the end of a long afternoon’s work at regular school subjects, the master should occupy the last half-hour or so (if the other lessons have been well said) with a discussion upon his special branch, showing specimens, encouraging questions, and making this part of his work as different as possible from the ordinary work. Boys will look forward to this time, and will work all the harder at their other work to get this ‘talk,’ if a good lesson is required before the natural history one. By the end of a term, with a little system, the elements of the subject may easily be learnt. The next term, masters should change forms for this half-hour, and the boys thus have some new subject put before them. In a few terms, therefore, a very fair general knowledge of natural history may be secured. If a boy showed any aptitude in any one branch, there would be a master at hand ready to help him and get him on.”

MR. C. S. WILKINSON, the New South Wales Government Geologist, reporting upon the seams of coal pierced in the diamond-drill bore at Holt-Sutherland, near Sydney, says that in this bore a depth of 2307 feet from the surface, or 2175 feet below sea-level, has been attained. This is the deepest diamond-drill bore in Australia. The diameter of the bore to a depth of 500 feet is $3\frac{1}{2}$ inches, and below that depth it is 3 inches. The strata passed through consist of Hawkesbury sandstones, 653 feet 6 inches; shales, sandstone, and conglomerates (the upper 314 feet consisting chiefly of chocolate-coloured shales), 1573 feet 3 inches; upper seam of coal, 4 feet 2 inches; shales, sandstone, and conglomerate, 65 feet; lower seam of coal, 5 feet 3 inches; black shaly sandstone, 5 feet 11 inches.

A HEAVY snowstorm is reported to have occurred on the Scheekoppe on June 11. On the Kapellenberg, between Hirschberg and Schönau, it snowed severely, and in the night the thermometer sank to 3°.

A TELEGRAM from Omsk to St. Petersburg of the 21st inst. states that there were several slight oscillations of the ground at Vernoé on that day. To the west of Karakoul the earthquake had been more violent than at the latter place; a lake in the neighbourhood had sunk 3 feet. Almost all the Government buildings at Vernoé are said to be destroyed.

Two beaver colonies have just been discovered at Amlid, near Christiansand, Norway. On the bank of a river the beavers have made lodges of branches of trees, which are held together with clayey mud, the whole resting on logs of wood. The entrance, a hole, faces the river, but is below the surface of the water. Round the entrance there are numbers of aspen and birch trees, the bark of which has served as food for the animals. The beaver gnaws the tree about 2 feet from the root, and if it finds the bark to its taste, cuts the tree up in pieces from 2 to 3 feet in length, which the animal then drags or carries down to its house proceedings which are fully demonstrated by the many “log-runs” in the woods along the river bank. Observers have also noticed another remarkable habit of this interesting animal, viz. that on arriving by the water-side with such a log of wood it will poise the piece on the back of its neck and swim with it right into the lodge, where the bark is gnawed off and

stored away for winter use. This accomplished, it will shoot the log into the river. The largest trees the animals have dealt with in this manner are 11 inches in diameter. The colonies are situated far from human dwellings, where people only come in winter, during the timber-felling season.

AT the Ladies’ Soirée at the Royal Society on June 8, much attention was attracted by the fine exhibit sent from the Royal Gardens, Kew. Great credit is due to the officials at Kew for the care with which the objects were selected and displayed. The following is a list of the flowering plants:—*Myrmecodia Beccari*, *Myrmecodia* sp. New Guinea, *Leea amabilis*, *Impatiens Hawkeri*, *Primula Reidii* and *cortusoides*, *Piper porphyrophyllum*, *Streptocarpus Dunnii* and *polyanthus*, *Coffea liberica*, *Tillandsia splendens* and *usneoides*, *Caraguata Zahnii*, *Cypripedium Stoneii*, *Dendrobium Dalhousieanum* and *transparentes*, *Epidendrum vitellinum*, *Odontoglossum Hallii*, *Miltonia vexillaria*, *Sarracenia Patersoni*, *Palumbina candida*, *Arceca monostachya*, *Licuala grandis*, *Verschaffeltia splendida*, *Caryota Blanchoi*, *Cycas undulata*, *Hemitelia Smithii*, *Adiantum amabile*, *Acrostichum crinitum*, *Brainea insignis*, *Saccolabium curvifolium*. There were cut flowers of *Hæmanthus magnificus*, *Randia Stanleyana*, *Hexacentris mysorensis*, *Senecio macroglossa*, *Iris Susiana*, *Chamaedorea elegantissima*, *Bougainvillea spectabilis*, *Napoleona imperialis*, *Cochliostema Jacobianum*, *Pandanus odoratissimus* (cone), *Musa coccinea*.

THE additions to the Zoological Society’s Gardens during the past week include a Moustache Monkey (*Cercopithecus cephus* ♀) from West Africa, presented by Mr. Bernard Lawson; a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Mr. G. Choutte; two Lions (*Felis leo* ♂ ♀) from Kittywar, Guzerat, India, presented by Major J. Humphrey; two Striped Hyænas (*Hyæna striata*) from India, presented by the Bombay Natural History Society; a Suricate (*Suricata tetradactyla*) from South Africa, presented by Mrs. H. A. Warwood; an Australian Crane (*Grus australasiana*) from Australia, presented by Mrs. M. S. Richman; a Ring-necked Parrakeet (*Palæornis torquatus*) from India, presented by Mrs. Crabtree; two Edible Frogs (*Rana esculenta*), European, presented by Mr. H. A. Crossfield; three Green Turtle (*Chelone viridis*) from Ascension, presented by Capt. C. Theobald, R.N.; a European Pond Tortoise (*Emys europea*) from Venice, presented by Mr. Alban Doran; an Alligator (*Alligator mississippiensis*) from Florida, presented by Mr. Hugh Bellas; a Green Monkey (*Cercopithecus callitrichus* ♂) from West Africa, five Common Dormice (*Muscardinus avellanarius*) British, deposited; a Little Egret (*Ardea garzetta*), a Buff-backed Egret (*Ardea russata*), European, a Horrid Rattlesnake (*Crotalus horridus*) from Brazil, purchased; a Yak (*Poëphagus grunniens*), born in the Gardens.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1887 JULY 3-9.

(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 July 3.

Sun rises, 3h. 50m.; souths, 12h. 3m. 53°0s.; sets, 20h. 17m.; decl. on meridian, 22° 59' N.; Sidereal Time at Sunset, 15h. 3m.

Moon (Full on July 5) rises, 18h. 22m.; souths, 22h. 48m.; sets, 3h. 11m.*; decl. on meridian, 19° 4' S.

Planet.	Rises.		Souths.		Sets.		Decl. on meridian.	
	h.	m.	h.	m.	h.	m.	h.	m.
Mercury ...	6	11	13	52	21	33	18	12 N.
Venus ...	7	55	15	11	22	27	13	54 N.
Mars ...	2	30	10	49	19	8	23	46 N.
Jupiter ...	13	35	18	53	0	11*	8	56 S.
Saturn ...	4	57	12	59	21	1	21	25 N.

* Indicates that the setting is that of the following morning.

Occultations of Stars by the Moon (visible at Greenwich).

July.	Star.	Mag.	Disap.	Reap.	Corresponding angles from vertex to right for inverted image.	
					h. m.	h. m.
6	π Capricorni	5	21	3	near approach	149° —
6	B.A.C. 7053	5½	21	49	22 53	37 280
6	o Capricorni	5½	21	49	22 54	38 280
9	42 Aquarii	6	0	48	1 45	43 320

Variable Stars.

Star.	R.A.		Decl.		h. m.
	h. m.	°	h. m.	°	
U Cephei	0 52.3	81 16 N.	July	7, 23	13 m
δ Libræ	14 54.9	8 4 S.	"	9, 0	8 m
U Coronæ	15 13.6	32 4 N.	"	9, 1	29 m
U Opbiuchi	17 10.8	1 20 N.	"	6, 0	12 m
S Sagittarii	19 12.8	19 14 S.	"	9,	M
T Capricorni	21 15.8	15 38 S.	"	9,	M
δ Cephei	22 25.0	57 50 N.	"	8, 1	0 m

M signifies maximum; m minimum.

MR. MCCARTHY, the Government Surveyor of Siam, has just returned to this country, with a very fine set of maps of that country, embodying the results of seven years' survey work. These he is working out at the Royal Geographical Society.

MR. W. J. STEAINS has just returned from Central Brazil, where he has spent a considerable time among the Botocodos, a savage people, concerning whom our information is exceedingly scanty. Mr. Steain's has collected much information concerning these people, and brought home some two hundred sketches, which he will probably publish soon in some form.

ONE of the public lectures at the Manchester Meeting of the British Association will be by Sir Francis De Winton, late Governor of the Congo Free State. Sir Francis, we believe, will illustrate his lecture with a series of maps (perhaps thrown on the screen) showing the progress of our knowledge of Central Africa from the time of Ptolemy down to the present day.

DISCOVERY OF FOSSIL REMAINS OF AN ARCTIC FLORA IN CENTRAL SWEDEN.

FOR the first time fossil remains of an Arctic flora have been discovered in the great stretch of land between Scania and Norrland. The discovery was made in a part where it was least expected, viz. just north of the town of Vadstena, close to the shore of the lake Wetteren. The soil in the vicinity of Vadstena greatly resembles that of South-Western Scania, being mostly formed of moraine clay or clayey moraine sand, whilst marine formations appear to be absent in the former place; they are, however, found further to the north-east, but I have as yet been unable to ascertain the limits of the two districts. Within the moraine clay are found here and there little cavities or depressions, occupied by peat bogs or alluvial formations. Close to the shore of the lake Wetteren, barely a third of a kilometre north-east of Vadstena, such a depression occurs, occupied by a peat bog. This peat bog continues to the north-east beyond the depression, a little way up the rising ground, caused by the existence here of some strong wells, around which in remote times considerable quantities of calcareous tufa have formed. My attention was drawn to this locality by Dr. J. Jönsson, who had noticed the tufa under some work effected for the Geological Survey of Sweden, but not having closely examined the fossil remains of plants in the same, he was only able to inform me that he had found mosses therein.

On examining the collection of specimens of the tufa obtained, I found at the back of one some well-preserved leaves of *Dryas octopetala*, L., other fossil remains in the same fragment, besides mosses, being branches of *Empetrum* and leaves of *Vaccinium uliginosum*, L. In consequence of this discovery, I decided to visit the spot myself, partly in the hope of discovering some more specimens of *Dryas*, and partly in order to study the adjacent layers of earth and the strata containing the fossil plants. But although I spent a whole day in examining loose blocks and the accessible parts of the strata I did not succeed in finding any more leaves of *Dryas*.

The calcareous tufa is, as I have stated, deposited on a declivity and around a well, and the latter, whose flow is rather strong, is now exposed through the removal of the peat (a couple of feet in thickness) which covered it, along with the tufa immediately round the well. The latter appears to have rested immediately on clayey moraine debris or moraine clay (bottom moraine), whilst nearest the well the lower layers are sinter-formed without distinct remains of plants, though probably containing such pine needles and mosses as are found in the upper layer. The mosses are in the upper part of the tufa in certain places common, and form sometimes separate layers consisting solely of such. The composition of the bed seemed to be as follows:—Lowest, the lime had formed round growing grass or Juncaceæ, the leaves of which are indicated by more or less perpendicular holes. Next above this appears a more distinctly stratified tufa, containing leaves and exterior bark of the pine, but, judging from the fragments thrown up in the vicinity, the layer containing *Betula nana* should be placed between these two. As a proof of such a layer are the mosses, leaves of *Vaccinium uliginosum*, *Empetrum*, and even needles of pine, although more seldom than in the true pine layer. From the layer containing remains of dwarf-birch the piece of tufa with

GEOGRAPHICAL NOTES.

AT Monday's meeting of the Royal Geographical Society, Mr. J. T. Last gave a brief preliminary account of his recent explorations among the Namulli Hills, to the south-east of Lake Nyassa and along the River Rovuma. He found that, although the thermometer often falls below freezing-point, no snow exists on the Namulli Hills. At the same meeting, General Haig read an unusually interesting paper on a recent journey he made in the south-west corner of Arabia. He started from Hodeida, went inland to Sana'a, and south to Aden. He found himself in a region of mountains rising to over 10,000 feet, in many places terraced by the natives up to a height of 8000 feet. The scenery was often of the most magnificent and picture-que description, and the climate so comparatively temperate as to be suited for European settlement. The whole region of which this forms part, and indeed the entire southern portion of Arabia, including Hadramaut and Omân, is one that would richly repay serious exploration. General Haig made a journey of about fifty miles into the interior of Omân, and found that, while there was a rainfall of only 6 inches on the coast, at least 30 inches fell upon the hills of the interior.

SOME further steps have been taken in Australia for the prosecution of Antarctic exploration. The Antarctic Committee appointed by the Royal Society of Victoria and the Royal Geographical Society of Australia have memorialized the Premier of Victoria on the propriety of stimulating Antarctic research by the offer of bonuses. They recommend that a sum of £10,000 be placed on the Estimates for this purpose, and that tenders be solicited from shipowners for the performance of services in connexion with Antarctic exploration. It is stipulated that shipowners whose tenders are accepted shall provide, free of charge, cabin accommodation in each ship for two gentlemen, who will sail as the scientific staff; and a second cabin as instrument-room and office. The master of the ship must afford these gentlemen every facility for observing natural phenomena. The master will receive special bonuses for every hundred tons of oil from fish caught south of 60° S. The special services desired are as follows:—A flying survey of any coast-lines lying within the Antarctic Circle, and not laid down upon the Admiralty charts; the discovery of new waterways leading towards the South Pole, and of harbours suitable for wintering in. Opportunities must be afforded to the scientific staff to add to our knowledge of the meteorology, oceanography, terrestrial magnetism, natural history, and geology of the region. Special bonuses will be given for passing 70° S., and also for establishing on shore a temporary observing camp. Two ships are wanted, and both must be in Port Philip Bay and ready to start on October 15. The Premier of Victoria, we are glad to say, has promised to place £10,000 on the next Estimates for these purposes, on condition that the other colonies will join in the enterprise; this they no doubt will do.

THE Russian Government has decided to establish Chairs of Geography in the Universities of the empire. The first appointment will be to the University of St. Petersburg in the autumn of the present year.