

mosses, and other rock-loving plants, which, by being mixed with sand and particles of rock, would necessitate the development of such long lasting molars as it is remarkable for possessing. Additional specimens of *Eupetaurus* would be most valuable for scientific examination, especially if of different ages; and Mr. Thomas expresses a hope that some of the many British sportsmen who annually visit Kashmir will help to enrich either the Indian Museum in Calcutta, or the National Museum at home, with examples of this, the latest addition to the mammal fauna of our Indian Empire.

IN the new number of the *Zoologist* Mr. T. Southwell has an interesting article on Pallas's sand grouse in Norfolk. Speaking of a large flock which Mr. Wood, of Morston, had under his close observation for some months, Mr. Southwell says that they frequented the same fields with great regularity; their favourite feeding-place being a large clover layer, from which, if disturbed, they flew across to some adjacent turnip-fields, choosing the bare patches for their feeding-ground. Here they spread over a circle of some 30 or 40 yards, separating, and diligently searching the ground until they appeared to have exhausted the food in that particular locality, when they all rose together and repaired to a fresh spot, which they exhausted in like manner. At stated times they departed for the salt marshes adjacent. The bird is usually extremely shy, but not always. Mr. A. Napier was shooting on the Holkham sand-hills with Lord Leicester and party, on October 13, when they met with a flock of about thirty-five. "A single bird," says Mr. Napier, "which I came upon, I felt convinced must have had either a nest or young. When first I saw it, it fluttered along in front of me just like a partridge with young. It was so tame that I called Lord Leicester and the others up to see it, and it did not fly up until we had approached to within 3 or 4 yards of it. At first I thought it must have been a wounded bird, but I do not think so now, for it flew away very strongly, calling out most lustily. Its action reminded me very much of the turtle-dove." Other incidents of a like kind are recorded by Mr. Southwell. On August 5 the gardener at Shernbourne Hall came to Mr. Parsons to say that a sand grouse was running about on the lawn. Mr. Parsons went out to catch it, thinking his son's pinioned bird had escaped. On being approached, the bird "ran and skulked in a little ditch," and did not rise till Mr. Parsons was about to put his hand on it, when it flew away "quite strong." Another, now in Mr. Gurney's aviary at Northrepps, was found, on October 31, floundering in a wet ditch at Suffield, and taken by hand.

We learn from the *Canadian Record of Science* (vol. iii. No. 3) that in June 1887 a small collection of graptolites was obtained by Dr. G. M. Dawson, on Dease River, in the extreme northern and inland portion of British Columbia, about lat.  $59^{\circ} 45'$ , long.  $129^{\circ}$ . These fossils were derived from certain dark-coloured, carbonaceous and often calcareous shales, which, in association with quartzites and other rocks, characterize a considerable area of the lower part of the Dease, as well as the Liard River, above the confluence. In 1886 a similar small collection was obtained by Mr. G. R. McConnell, near the line of the Canadian Pacific Railway, in the Kicking Horse (Wapta) Pass. No other locality in the western portion of the Dominion has yet been found to yield graptolites. Prof. Lapworth, to whom Dr. Dawson's collection has been transmitted, thinks that the graptolite-bearing rocks are clearly of about Middle Ordovician age. They contain forms he would refer to the second or Black River Trenton period; *i.e.* they are newer than the Point Lévis series, and older than the Hudson and Utica groups. The association of forms, he says, is such as we find in Britain and Western Europe, in the passage beds between the Llandeilo and Caradoc Limestones.

THE following are the lecture arrangements of the Royal Institution before Easter:—Prof. Dewar, six lectures (adapted to

a juvenile auditory) on clouds and cloudland; Prof. G. J. Romanes, twelve lectures constituting the second part of a course on before and after Darwin (the evidences of organic evolution and the theory of natural selection); Prof. J. W. Judd, four lectures on the metamorphoses of minerals; Dr. Sidney Martin, four lectures on the poisonous action of albuminoid bodies, including those formed in digestion; Prof. J. H. Middleton, four lectures on houses and their decoration from the classical to the mediæval period; Prof. Ernst Pauer, four lectures on the characters of the great composers and the characteristics of their works (with illustrations on the pianoforte); and eight lectures by the Right Hon. Lord Rayleigh, on experimental optics (polarization; the wave theory). The Friday evening meetings will begin on January 25, when a discourse will be given by Prof. G. H. Darwin; succeeding discourses will probably be given by Prof. W. C. McIntosh, Sir William Thomson, Prof. A. W. Rücker, Mr. Harold Crichton Browne, Prof. Oliver Lodge, Prof. Archibald Geikie, the Rev. Alfred Ainger, the Right Hon. Lord Rayleigh, and other gentlemen.

THE Russian naturalist, M. K. Nossilów, has been making geological investigations in Nova Zembla, and has discovered traces of gold.

PROF. OLIVER J. LODGE writes to us as follows about his letter on the "Velocity of Sound" (*NATURE*, November 22, p. 79): "In equation (6),  $U + v$  should, strictly, be  $-U + v$ , because the sign of  $U$  has changed with its signification. Equation (7) is therefore wrong. In the paragraph between equations (3) and (4), the words 'condensation' and 'rarefaction' should be transposed."

THE additions to the Zoological Society's Gardens during the past week include two Squirrel Monkeys (*Chrysothrix sciurea*) from Guiana, presented by Master H. B. Young; a Silvery Gibbon (*Hylobates leuciscus* ♂) from Burmah, presented by Captain D. L. de la Chevois; a Pig-tailed Monkey (*Macacus nemestrinus* ♀) from Java, presented by Mr. W. Merryweather; a Polecat (*Mustela putorius*), British, presented by Mr. F. D. Lea Smith, F.Z.S.; a Raven (*Corvus corax*), British, presented by Mr. C. Petrzywalski; a Sparrow Hawk (*Accipiter nisus*), British, presented by Mr. G. Skegg; two Barn Owls (*Strix flammea*), British, presented by Mr. E. Hart, F.Z.S.; a Lion Marmoset (*Hapale rosalia*) from Brazil, deposited; a Blue-cheeked Barbet (*Megalæma asiatica*) from India, a Golden-crowned Conure (*Conurus aureus*) from South-East Brazil, a Golden-winged Parrakeet (*Brotogeris chrysopterus*) from the Amazons, purchased.

#### OUR ASTRONOMICAL COLUMN.

STONYHURST COLLEGE OBSERVATORY.—The Report of this Observatory for 1887, which has been recently published, is of the usual character, giving the results of the magnetic and meteorological observations for the year. The daily areas of the spots observed upon the sun during 1886 and 1887, expressed in millionths of the sun's visible hemisphere, are also given in both tabular and graphical form. The latter shows in a very striking manner the remarkable depression in spot-activity which marked the seven months from the end of September 1886 to the end of April 1887, and the regular series of gentle undulations which succeeded it. A note on the "Upper Glows in 1887" records that the white haze round the sun, and the pink "fore" and "after" glows consequent upon the Krakatão explosion, were still observed occasionally in 1887, but more feebly and less frequently than in 1886.

THE HOPKINS OBSERVATORY.—The little Observatory of this name attached to Williams College, Mass., is the oldest public Observatory in the United States, and during the past summer the jubilee of its dedication was duly celebrated. This interesting commemoration was made the occasion for the delivery of a discourse by Prof. T. H. Safford, Field Memorial Professor of Astronomy at Williams College, on the development of astro-

nomy in the United States, with especial reference to its earliest days; indeed Prof. Safford in his address went back not merely to the surveying work of Mason and Dixon, but even glanced lightly at the history of the institution where the former had been trained—Greenwich Observatory. The Hopkins Observatory was the work of the two brothers, President Mark Hopkins and Prof. Albert Hopkins, the latter of whom worked with his own hands at the erection of the building. Both were gifted men, and of advanced ideas, and their purpose in erecting the Observatory seems to have been the hope that the practical work of observing would increase their students' interest in the science, and develop their powers in fresh directions. It is still used by the students for occasional star-gazing, but for scientific purposes it has been superseded of late years by the meridian instrument of the "Field Memorial Observatory." The Hopkins Observatory was soon followed by others, at West Point, at Harvard College, at Washington, and other places, but though there had been previously one or two private observatories, and also a few telescopes in the possession of some public bodies, as, for example, at Yale College, yet until 1838 no permanent structure had been erected for any public observatory, so that the credit of being the pioneer of the long and distinguished succession of American Observatories belongs to the little building erected by the energy of Prof. Hopkins.

**ASTRONOMICAL PHENOMENA FOR THE WEEK 1888 DECEMBER 9-15.**

(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 December 9

Sun rises, 7h. 56m.; souths, 11h. 52m. 48' 6s.; sets, 15h. 47m.; right asc. on meridian, 17h. 7' 4m.; decl. 22° 54' S. Sidereal Time at Sunset, 21h. 4m.

Moon (at First Quarter December 10, 7h.) rises, 12h. 36m.; souths 17h. 43m.; sets, 23h. om.; right asc. on meridian, 22h. 58' 8m.; decl. 10° 51' S.

Planet.	Rises.		Souths.		Sets.		Right asc. and declination on meridian.	
	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	
Mercury...	7 1	11 7	15 13	16 21	21 23	S.	21 23	
Venus...	10 41	14 37	18 33	19 51	23 4	S.	23 4	
Mars.....	11 4	15 19	19 34	20 34	20 5	S.	20 5	
Jupiter...	7 52	11 51	15 50	17 57	22 27	S.	22 27	
Saturn....	20 53*	4 19	11 45	9 32	15 40	N.	15 40	
Uranus...	2 39	8 4	13 29	13 18	7 37	S.	7 37	
Neptune..	14 54	22 38	6 22*	3 54	18 34	N.	18 34	

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

**Variable Stars.**

Star.	R.A.		Decl.		h. m.
	h. m.	h. m.	h. m.	h. m.	
U Cephei ...	0 52	81 16	N.	Dec. 9,	23 25 m
Algol ...	3 09	40 31	N.	" 14,	23 5 m
U* Orionis...	5 49	20 9	N.	" 9,	9 m
T Monocrotis ...	6 19	7 9	N.	" 11,	3 0 M
ζ Geminorum ...	6 57	20 40	N.	" 9,	6 0 m
R Canis Majoris ...	7 14	16 12	S.	" 9,	19 9 m
and at intervals of 27 16					
T Canis Minoris ...	7 27	11 59	N.	Dec. 9,	11 m
S Libræ ...	15 15	19 59	S.	" 12,	m
T Herculis ...	18 49	31 0	N.	" 9,	11 m
β Lyræ... ..	18 46	33 14	N.	" 13,	20 0 m
R Serpentis ...	19 10	19 3	S.	" 13,	M
S Aquilæ ...	20 6	15 17	N.	" 15,	m
T Vulpeculæ ...	20 46	27 50	N.	" 9,	19 0 m
Y Cygni ...	20 47	34 14	N.	" 10,	1 48 m
δ Cephei ...	22 25	57 51	N.	" 13,	1 42 m
				" 11,	6 0 M
				" 15,	0 0 m

M signifies maximum; m minimum.

\* Mr. Gore's new variable discovered in 1885. This star has hitherto been more generally known as T Orionis, but as Mr. Chandler gives it the above denomination in his new Catalogue of Variable Stars, reserving T Orionis for the tenth magnitude variable in the great Orion nebula discovered by Bond in 1863, it will be well for observers, in order to avoid confusion, to follow his nomenclature.

**Meteor-Showers.**

	R.A.	Decl.	
Near Castor ...	108	33 N.	Swift; short. The Geminiids. Max. December 10-11.
From Leo Minor ...	144	38 N.	Swift; streaks.
„ Sextans ...	145	7 N.	„ „
Near λ Draconis ...	160	70 N.	

**GEOGRAPHICAL NOTES.**

THE rumour brought from the Cameroons as to the position of Mr. Stanley is too vague to be of much value. He is said to be behind "the Oil Rivers and the Niger," annexing territories wholesale for the British Crown. He may possibly enough be coming out in this direction. If so, he must have been with Emin, for it is inconceivable that, if able to get so far, he would fail in the chief object of his mission. If he has been with Emin, that must have been some time ago, and surely some word of it would have oozed out. We should not be surprised to find Mr. Stanley coming out by the West Coast; it would be quite in accordance with the purpose he had of settling, if possible, the problem of the Shari and Wellé. He may have sought to discover the parting that separates the basins of Lake Chad and the Congo, and the upper waters of the Binué. If he has really been on the Binué, we should have expected some definite news from the officials of the Royal Niger Company.

THOUGH Mr. Joseph Thomson was summoned home from Morocco to lead an expedition to Emin Pasha, we regret to learn that the British East African Company are hesitating to carry out the purpose they entertained when they telegraphed for Mr. Thomson.

M. RABOT, in describing to the Paris Geographical Society the results of a visit which he recently made to Western Greenland, states the following conclusions:—In comparing the inland ice of Greenland with the glaciers of Lapland, it appears to him absolutely certain that the latter are nothing more than inland ice in miniature. The Lapland glaciers are simply the remains of the Glacial period in Scandinavia, which have persisted to the present time owing to special circumstances. The great glacier of Jakobshavn, on the west coast of Greenland, has been advancing during the last few years. Its front edge is at present 3 kilometres in advance of the point where it was seen by Lieut. Hammer in 1878. The drift ice of the south-west coast transports only a very small quantity of material. M. Rabot saw only one piece among fifty or sixty which bore debris of detritic origin, while traversing pack-ice 60 miles broad. Only one piece was black with earth.

IN connection with Dr. Nansen's journey across Greenland, a paper by Dr. Rink, in No. 137 of the *Zeitschrift* of the Berlin Geographical Society, is of interest. Dr. Rink discusses the data which have been obtained by the various Danish Expeditions to Greenland, as well as by the parties which at different times have attempted to cross the land. He enters in some detail into the general subject of glaciation, and the relation between glaciers and icebergs. He seems to be of opinion that the ice of Greenland is shrinking, as he points out that there are evidences that at one time the ice covered the whole of the coast-land, which is at present free, as well as the peninsulas and islands in its vicinity.

THE same number contains a paper, by Dr. von Danckelmann, on the altitudes of the country at the junction of the Kassa and Congo.

IN No. 8 of the *Verhandlungen* of the Berlin Geographical Society, Dr. Schweinfurth gives a useful sketch of his explorations in Egypt during the past fifteen years. In a letter to the President, in the same number, Dr. Hettner describes his observations on the Peruvian coast between Mollendo and Arequipa.