

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

Nov.	Star	Mag.	Disap.		Reap.	Corresponding angles from vertex to right for inverted image
			h. m.	h. m.		
22 ...	46 Virginis	... 6	... 4 42	... 5 31	... 72	176 <sup>o</sup>
22 ...	k Virginis...	... 6	... 4 58	near approach	304	—
22 ...	48 Virginis	... 6	... 6 36	... 7 8	... 104	163
23 ...	B.A.C. 4647	... 6	... 4 42	... 5 40	... 24	222

Nov. 23 ... I ... Jupiter in conjunction with and 3° 0' south of the Moon.  
23 ... 14 ... Mercury stationary.

## Variable Stars

Star	R.A.		Decl.		h. m.
	h. m.	°	h. m.	°	
U Cephei ...	... 0 52.2	... 81 16 N.	... Nov. 28,	2 27	m
ζ Geminorum ...	... 6 57.4	... 20 44 N.	... ,, 23,	21 30	M
S Canis Minoris ...	... 7 26.5	... 8 34 N.	... ,, 24,		M
S Sagittarii ...	... 19 12.8	... 19 14 S.	... ,, 21,		M
η Aquilæ ...	... 19 46.7	... 0 43 N.	... ,, 24,	0 0	M

M signifies maximum; m minimum.

## Meteor Showers

The *Andromedes*, maximum November 27, R.A. 24°, Decl. 44° N., form the most interesting shower of the week. A radiant near  $\mu$  Persei, R.A. 60°, Decl. 49° N., supplies very swift meteors; swift meteors are likewise seen from a radiant near  $\eta$  Ursæ Majoris, R.A. 208°, Decl. 43° N.

## GEOGRAPHICAL NOTES

THE *Bulletin* of the Paris Geographical Society for the present year (Nos. 1 and 2) contain several papers of interest. We need no more than mention M. Ch. Mannoir's annual report on the progress of geography during the past year, which fills 130 pages. M. Grandidier writes on the rivers and lagoons of part of the east coast of Madagascar, and M. Gouin, of Nam-dinh, contributes a long paper on Tonquin, which deals with the commercial geography of the country rather than with the geography proper. No. 2 opens with the report of a strong Committee of the Society on the orthography of geographical names, which will be read with interest. No elaborate or exhaustive reforms are proposed; the suggestions are rather a series of simple modifications "based on good sense rather than on high philological science, which is only accessible to the few initiated." The Committee take up the programme of the Royal Geographical Society, "completing it in some respects, and making some additions sensible to musical ears." The bases of the proposals are the same as those of our own Society: (1) not to seek an absolute perfection in the representation of sounds; (2) to preserve in European names the form of the country of their origin; (3) to retain in the case of other places the mode commonly employed. M. Rolland contributes a long paper on the hydrography and orography of the Algerian Sahara; and M. Marteil examines the map of the French establishments on the Senegal recently issued by the Ministry of Marine. Lieut. Baudens describes a trip which he made last year along the Black River of Tonquin; and finally there is an account written by Dr. Potagos in 1880 of a journey which he made in the Pamir in 1870, including a visit to the famous Yakub Beg of Kashgar.

We have received the *Verhandlungen* (Bd. xiii. No. 8) and the *Zeitschrift* (Bd. xxi. Nos. 4 and 5) of the Geographical Society of Berlin. The first contains only one paper, but that an interesting one, by Dr. Sievers, on a recent journey in the Sierra Nevada de Santa Marta, in Columbia. The object of the journey was to study the geology and physical geography of the region, and especially to ascertain whether these mountains belong to the system of the Andes or not. As Dr. Sievers has only been back for a short time, he was unable to give any definite results, and he confines himself to describing the course of the journey, and to mentioning important points necessary for a proper understanding of the physical geography of the region. In the *Zeitschrift*, Herr Jung continues and concludes his analysis of the Indian census of 1881; this is followed by a translation, from the *Proceedings* of the Russian Geographical Society, of Dr. Iwanow's paper on certain ancient monuments discovered by him in the course of a geological examination of Turkestan. Prof. Gelcich has a highly technical history of the

methods of ascertaining the area of a country, and Dr. von Danckelmann one on the frequency of rain in the Indian Ocean. Herr Sandler makes a contribution to the history of cartography by giving an account of the life and works of Johann Baptista Homann, a geographer of the latter part of the seventeenth century. A curious map appended to this paper (which is of considerable length) shows, by means of white and red outlines, the world according to present cartography and according to Homann's maps. The number concludes with a short paper on the hot springs of Kamchatka.

IN a recent work on the geology and geography of Sumatra, M. Verbeek, a Dutch engineer, says that sixty-seven volcanoes are known to exist on that island. There may be more even than this, for parts of the north-west, which are covered with primæval forests, have never been penetrated. Two only of these are active, Merapi and Talang (or Soclau), the former being 2892, and the latter 2542 metres in height.

THE October issue of the *Bollettino* of the Italian Geographical Society contains an account of an excursion made during the summer by E. Modigliani to the rarely visited island of Nias, which lies some thirty miles from the west coast of Sumatra, a little north of the equator. The explorer spent two months in the place, but owing to local feuds was unable to penetrate beyond Fadoro, a large village near Telok Dalam Bay on the south side. The natives, apparently of Malayan or Indonesian stock, but speaking a language quite different from Malay, and by Crawford described as "a simple, mild, and primitive people," he found on the contrary to be fierce and treacherous savages, everywhere addicted to head-hunting. Their hostility was such, that he failed to make any botanical or zoological collections; but fortunately secured eleven human skulls from the southern districts, which have been sent to the Anthropological Museum of Florence. No similar specimens appear to have hitherto reached Europe, nor are any found even in the Batavian collection. Head-hunting is taken so much as a matter of course, that on Sig. Modigliani offering to purchase some skulls, the rajah of Bavalovani on the south coast quietly remarked that it would be rather an expensive business, as an expedition would have to be specially fitted out and sent to the hills to raid upon some neighbouring tribes and carry off the required number of heads. He had no idea of craniological specimens being collected except from the living subject. The interior of Nias still presents a promising field of exploration, never having been visited by any European travellers.

LIGHTHOUSE ILLUMINANTS<sup>1</sup>

## II.

## V.—Range of Lights in Hazy Weather

THE observations on this subject of the Trinity House Committee have served to confirm the conclusions announced by M. Allard in his "Mémoire sur l'intensité et la portée des phares," 1876, and in his more recent "Notes sur quelques objections relatives à l'emploi de la lumière électrique dans les phares." The Committee find that the gas and oil lights which are equal in clear weather are equal also in fogs; that in rather dense fog the more powerful light had but little advantage over the less powerful, for example, "the triform electric appearing at 1500 feet, while the quadriform gas and triform oil showed up together a little before the observers reached 1400 feet," and that the electric light, while suffering, according to the photometric results, a somewhat greater loss in hazy weather than the flame lights, is "visible at a greater distance than the highest powers tried in gas or oil." Using M. Allard's formula, which appears to rest on well-established physical and physiological data, I have calculated the range in fogs of various degrees of thickness of some of the lights exhibited at the South Foreland. The range of a light, or the limit at which it is just lost or just picked up, is that limit at which its intensity is diminished by distance and haze to the minimum intensity perceptible by a good eye, such as the practised eyes of seamen are. M. Allard gives this minimum intensity, on the authority, of "des expériences qui ont été faites sur ce sujet au Champ de Mars," as that of 1/100 Carcel at a distance of one kilometre on a perfectly clear night. This corresponds to  $\frac{1}{3}$  candle at a distance of one nautical mile. When the air is not perfectly clear,

<sup>1</sup> Further Report of Mr. Vernon Harcourt to the Board of Trade on the Experimental Lights exhibited at the South Foreland. Continued from p. 46.