

left for a Chinaman. The custom of head-hunting which prevails in some districts is mainly intended to prove the valour of the young men. On the whole, Mr. Taylor has given us a large number of details, classified under various tribes, which were not known before.

In the September number of the *Meteorologische Zeitschrift*, Prof. Hann gives the results of many years' observations on the temperatures of the various parts of the Vienna forest. The forest valleys have a considerably lower temperature than the open land outside. This difference is smallest in winter and greatest in summer. But there is no similar effect during the course of the day, for the afternoon difference is not the greatest. It is actually least in the warmer hours of the day, and greatest in the cooler part. In the early morning and evening the influence of the forest in lowering the temperature of the air is greatest.

THE last number (vol. lv. Part 2, No. 2, 1886) of the *Journal* of the Asiatic Society of Bengal has for its first paper a list of butterflies taken in Kumaon, a district in the middle portion of the Himalayas, lying between Garhwal and Nepal, by Mr. Doherty, of Cincinnati, who spent several months towards the close of last year in the expedition. Mr. Doherty's failure in the higher regions bordering on Tibet leads him to advise entomologists that the three summer months are the only good ones for collecting, either on the desert plains of Tibet, or in the deep valleys of the Himalayas sheltered by the outer range from the violence of the monsoon rains. Dr. Barclay contributes two papers—one on a second species of Uredine affecting the Himalayan spruce-fir (*Abies Smithiana*, Forbes), the first being described in the first paper of the present volume; the second paper by the same writer relates also to new species of Uredine parasitic in the deodar (*Cedrus deodara*, Loudon). Mr. Atkinson concludes his six papers on the Indian *Rhynchoti*, which have been compiled in order "to provide those who may become interested in this order of insects with some guide to their classification and arrangement, and was at first devoted to the correction of our only English list, but this became so unsatisfactory that it was found better to revise the whole on the basis of Stål's numerous and elaborate essays." The number of species described under each family is: *Cicadidae*, 115; *Cercopidae*, 67; *Membracidae*, 33; *Jassidae*, 38; *Fulgoroidea*, 204. These figures, Mr. Atkinson adds, could probably be doubled in a few years, for the number of *Jassidae* alone awaiting examination should add several hundred species to the Indian fauna. Dr. King adds three apparently new *Primulas* from the higher parts of the Eastern Himalayas to the *Primulaceae* of Sir Joseph Hooker in his "Flora of British India." Finally M. de Nicéville has a paper "On the Life-History of Certain Calcutta Species of *Satyriinae*," with special reference to the Seasonal Dimorphism alleged to occur in them."

ANOTHER consignment of German carp (*Cyprinus carpio*) is to be imported by the National Fish Culture Association to meet the growing demand for this species, which is superior to its congener of this country. The Association, through its secretary, Mr. Oldham Chambers, has urged upon those possessing disused waters to introduce the carp, both the mirror and leather species, therein. Although the German carp belongs to the same genus as the English, the former is being imported to improve the latter, which have deteriorated in flavour and condition owing to lack of cultivation. The fish will be committed to the charge of the Marquess of Exeter's pisciculturist, who has proceeded to Germany for the purpose of bringing them over, together with other species.

AN amusing incident occurred last week at the Colonial and Indian Exhibition Aquarium, where a remarkable raven from

the Isle of Mull is now on view. On being fed it is the habit of this bird to hide the remnants of its repast in various parts of its habitat, and exhume them when prompted by hunger to renew the meal. One day a rat invaded the spot, and commenced to excavate for the hidden articles of consumption. Enraged at this proceeding, the raven fell upon the rodent, and gored it to death after a severe struggle on both sides.

MESSRS. WHITTAKER AND Co. will issue in the course of next week "On the Conversion of Heat into Work, a practical Hand-book on Heat Engines," by Mr. Wm. Anderson, M. I. C. E.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus* ♂) from India, presented by Mr. T. L. Brewer; a Macaque Monkey (*Macacus cynomolgus* ♂) from India, presented by Mr. Walter C. Horsley; a Bonnet Monkey (*Macacus sinicus* ♂) from India, presented by Mrs. Samuel Lloyd; a Common Squirrel (*Sciurus vulgaris*), British, presented by Miss F. Westrup; two Grey Seals (*Halicherus grypus*) from the Island of Canna, N. B., presented by Mr. R. Thom; a Varying Hare (*Lepus variabilis*) from Perthshire, presented by Mr. T. West Carnie; a Goshawk (*Astur palumbarius*) from France, presented by the Baron D'Eprenesnil; a Golden Plover (*Charadrius pluvialis*), British, presented by Mr. G. Smith; ten Common Vipers (*Vipera berus*), British, presented by Mr. C. F. McNiven; two Black-footed Penguins (*Spheniscus demersus*) from South Africa, purchased.

OUR ASTRONOMICAL COLUMN

THE BINARY STAR τ CYGNI.—Mr. J. E. Gore (who has taken up this branch of astronomy with great vigour) has published in the *Astronomische Nachrichten*, No. 2749, elements of the orbit of τ Cygni. Using the measures of Deimbowski, Burnham, Frisby, and Tarrant, he finds:—

$$\begin{array}{l|l} P = 53.87 \text{ years} & \Omega = 83^\circ 0' \\ T = 1863.99 & \lambda = 205^\circ 26' \\ e = 0.3475 & \alpha = 1''.19 \\ \gamma = 44^\circ 40' & \mu = -6''.68. \end{array}$$

These elements represent the observations fairly well. It must be remembered, however, that the measures only extend over a period of ten years, and the orbit must therefore be considered, as Mr. Gore states, to be provisional only.

THE LICK OBSERVATORY.—We learn from *Science*, vol. viii. No. 190, that the following plan has been devised by Prof. Holden for the working of the great telescope:—"We mean to put the large telescope at the disposition of the world by inviting its most distinguished astronomers to visit us one at a time, and to give to them the use of the instrument during specific hours of the twenty-four. Each day there will be certain hours set apart when the Observatory staff will relinquish the use of the equatorial to distinguished specialists who will come from the United States and from Europe to solve or to attack some one of the many unsolved problems of astronomy. In this way we hope to make the gift of Mr. Lick one which is truly a gift to science, and not merely a gift to California and to its University."

COMET BARNARD (1886 f).—Dr. J. von Hepperger has published the following elements and ephemeris for the comet discovered by Mr. Barnard on October 4:—

$$T = 1886 \text{ December } 24.3064 \text{ Berlin M.T.}$$

$$\begin{array}{l} \pi - \Omega = 78^\circ 56' 20'' \\ \Omega = 140^\circ 17' 55'' \\ i = 93^\circ 33' 52'' \end{array} \left. \vphantom{\begin{array}{l} \pi - \Omega \\ \Omega \\ i \end{array}} \right\} \text{Mean Eq. 1886 } \circ.$$

$$\log q = 9.91236$$

Error of middle place (O - C).

$$d \lambda \cos \beta = -8 \quad d \beta = -1.$$

Ephemeris for Berlin Midnight

| 1886 | R.A. | | | Decl. | Log Δ | Log r | Brightness |
|---------|------|----|----|-----------|--------------|---------|------------|
| | h. | m. | s. | ' | | | |
| Oct. 22 | 11 | 16 | 13 | 3 57.6 N. | 0.2961 | 0.1434 | 1.86 |
| 26 | 11 | 27 | 15 | 4 21.1 | 0.2747 | 0.1296 | 2.21 |
| 30 | 11 | 39 | 16 | 5 53.2 | 0.2520 | 0.1093 | 2.66 |
| Nov. 3 | 11 | 52 | 28 | 7 17 N. | 0.2281 | 0.0916 | 3.22 |

The brightness on October 6 is taken as unity.

10 SAGITTÆ.—Mr. S. C. Chandler has discussed, in the *Astronomische Nachrichten*, Mr. Gore's observations of this star, together with some of his own, and some observations made for the Harvard and Oxford Photometric Catalogues. The result of his inquiry is to give $M = 1885$ December 4d. 9h. 36m. G.M.T. + 8d. 9h. 11' 0m. (E-391), the duration of increase being 3' 00d., and of decrease 5' 38d., and the magnitude at maximum being 5.6, and at minimum 6.4. Mr. Chandler considers it likely that the period will prove to be within two minutes of the truth. Mr. Espin's value, however, is 1h. 28m. shorter.

THE OBSERVATORY OF RIO DE JANEIRO.—M. Cruls, in a communication to the Paris Academy of Sciences, states that the long-talked-of transference of the Rio Observatory is about to be commenced. The site chosen lies nearly on the same parallel as the present Observatory, but two minutes farther to the west. The Brazilian Observatory possesses, from its proximity to the tropic, an advantage over all others, in that for forty days in the year the sun's zenith distance does not exceed 1°. M. Cruls anticipates that in the new edifice he will be able to undertake, with success, observations of terrestrial magnetism, and of atmospheric electricity, and he would wish to set up a delicate seismograph for recording slight movements of the soil. He trusts also that the Observatory will bear its share in the great photographic survey of the heavens proposed by Admiral Mouchez.

ASTRONOMICAL PHENOMENA FOR THE WEEK 1886 OCTOBER 24-30

(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 October 24

Sun rises, 6h. 41m.; souths, 11h. 44m. 16' 6s.; sets, 16h. 47m.; decl. on meridian, 11° 50' S.; Sidereal Time at Sunset, 18h. 59m.

Moon (New on October 27) rises, 2h. 37m.; souths, 9h. 19m.; sets, 15h. 48m.; decl. on meridian, 4° 45' N.

| Planet | Rises h. m. | Souths h. m. | Sets h. m. | Decl. on meridian |
|-------------|----------------|-----------------|---------------|-------------------|
| Mercury ... | 8 22 ... | 12 47 ... | 17 12 ... | 18 30' S. |
| Venus ... | 5 41 ... | 11 9 ... | 16 37 ... | 6 58 S. |
| Mars ... | 10 44 ... | 14 37 ... | 18 30 ... | 23 30 S. |
| Jupiter ... | 5 33 ... | 11 3 ... | 16 33 ... | 6 37 S. |
| Saturn ... | 21 24* ... | 5 26 ... | 13 28 ... | 21 18 N. |

* Indicates that the rising is that of the preceding evening.

Oct. h. 30 ... 10 ... Mars in conjunction with and 6° 5' south of the Moon.

Variable Stars

| Star | R.A. h. m. | Decl. ° ' N. | Oct. | h. m. |
|-----------------|---------------|------------------------|----------|----------------|
| U Cephei ... | 0 52.2 ... | 81 16 N. | Oct. 24, | 4 51 <i>m</i> |
| R Ceti ... | 2 20.2 ... | 0 42 S. | " 29, | 4 30 <i>m</i> |
| Algol ... | 3 0.8 ... | 40 31 N. | " 24, | 23 3 <i>m</i> |
| λ Tauri ... | 3 54.4 ... | 12 10 N. | " 27, | 19 52 <i>m</i> |
| U Ophiuchi ... | 17 10.8 ... | 1 20 N. | " 25, | 22 30 <i>m</i> |
| | | and at intervals of 20 | " 29, | 21 22 <i>m</i> |
| β Lyræ ... | 18 45.9 ... | 33 14 N. | Oct. 30, | 21 30 <i>m</i> |
| S Vulpeculæ ... | 19 43.7 ... | 27 0 N. | " 28, | 21 30 <i>m</i> |
| R Sagittæ ... | 20 8.9 ... | 16 23 N. | " 29, | 21 30 <i>m</i> |
| δ Cephei ... | 22 24.9 ... | 57 50 N. | " 25, | 2 30 <i>m</i> |
| | | | " 28, | 21 30 <i>m</i> |

M signifies maximum; *m* minimum.

Meteor Showers

The present week offers fewer active radiants than the one just past. The following radiants are, however, represented:—Near β Canis Minoris, R.A. 105°, Decl. 12° N.; and from Cancer, R.A. 133°, Decl. 21° N. Both yield swift meteors, especially the latter. October 24 and 29 are fireball dates.

GEOGRAPHICAL NOTES

THE last volume of the *Izvestia* of the Caucasus Geographical Society (vol. viii. 2) contains a great variety of geographical information. General Stebnitzky contributes a most interesting paper on the figure of the earth, being a discussion of results obtained from pendulum-observations in connection with the opinions expressed by M. Faye. An excellent map of the province of Kubañ, on a scale of 13 miles to an inch, is accompanied by a sketch of the colonisation of the province, which already has a Russian population of more than one million inhabitants. M. Koshkul gives a short description of the "Naphtha Mountain," in the Transcasian region. The telegraphic determination of the longitudes of Tiflis, Shemakha, and Baku acquires the more interest, as it allows of the determination of the general error (14" 3) of the Caucasian triangulation and the deviations from the vertical line, due to local causes at these three places. A list of points whose position has been determined by the triangulation made in the Transcasian region, as also in Khiva and Bukhara, is given by MM. Pervas and Gedeonoff, and will be most welcome to cartographers. Among the notes we notice the following:—On the Caucasians of Kubañ, due to M. Zagursky, whose researches on the languages of the Caucasus are always so great a help to ethnography; a list of the Caucasian population in Kubañ in 1883, from which we learn that from Kubañ alone no less than 13,600 Circassians have emigrated since 1871; M. Chantre's craniological measurements are summed up by M. Zagursky; and M. Lessar contributes a paper on the north-western frontier of Afghanistan. The "Appendix" shows where the chief attention of the Caucasus Geographical Society is now directed. They contain translations of a work dealing with Armenia (the "Torus Akhpar" guide through Armenia, by the Archbishop Garegin Sravandzantz); of the Turkish "Salname" for the Erzeround Vilayet; of notes on Syrian-Khaldeans, by a native from Hossrabad; and of Mr. Charles Wilson's lecture on Asia Minor, delivered before the London Geographical Society.

THE first fascicule of the full Reports of the Polar Meteorological Station at the mouth of the Lena has just been published. It is the first fascicule of the second part, and contains the meteorological observations made since September 1, 1882, to August 31, 1883, compiled by M. Eigner, and published under the supervision of Dr. R. Lenz; the second fascicule of the same volume will contain the meteorological observations in 1883-84; while the first volume is reserved to magnetical observations, and the third will be devoted to the non-obligatory observations, among which the auroræ will occupy a prominent place. The meteorological observations now published, comprise the pressure of air, the temperature, elasticity of vapours, relative moistness, force and duration of wind, nebulosity, snow and rain, as also the temperature on the surface of the soil and the snow, and at depths of 40, 80, and 160 cm., these last two missing for the months of July and August 1883, in consequence of an accident to a thermometer. All observations are given in full, that is, for every hour, as also the monthly averages. The daily range of all elements is also represented by curves, whose scale is exactly that accepted for the publication of the French observations at Cape Horn; the work is accompanied, moreover, by a map of the mouth of the Lena, and of the station itself, as also by a drawing representing the station amidst the tundra, on the banks of a branch of the Lena. A full description of the instruments and their corrections is given both in Russian and in German.

THE October number of the *Proceedings* of the Royal Geographical Society has for its leading paper one by Sir Francis de Winton, on the Congo Free State, the conditions of its administration by Europeans, and its probable future. In this latter respect Sir Francis de Winton is naturally inclined to look on the favourable side. Of more strictly geographical interest is the letter from Mr. Grenfell recounting his latest explorations in the missionary steamer *Peace*, of the tributaries of the Congo, between Leopoldville and Stanley Falls, with very detailed maps.

Petermann's Mitteilungen for October contains a long paper by M. Nikitin, the chief geologist of the Russian Geological Committee on Glaciers in Russia. His object is to lay down the limits of the traces of glacial action in that country. Lieut. von François's journeys in the southern Congo basin are the subject of the next paper; and, finally, there is a brief account