

Africa, presented by Mr. B. B. Weil ; two Jackdaws (*Corvus monedula*, white var.) British, presented by Mr. Harding Cox, F.Z.S. ; eighteen Deadly Snakes (*Trigonocephalus atrox*) from Demerara, presented by Mr. J. J. Quelch, C.M.Z.S. ; a Common Chameleon (*Chamaleon vulgaris*) from North Africa, presented by Mr. J. Pettitt ; a Blue and Yellow Macaw (*Ara ararauna*) from South America, deposited ; four Lapland Buntings (*Calcarius lapponicus*), twelve Snow Buntings (*Plectrophanes nivalis*) European, six Cirl Buntings (*Emberiza cirrus*) British, purchased.

OUR ASTRONOMICAL COLUMN.

THE NEW COMET.—The following observations of the "Comet Holmes" are communicated to the *Comptes rendus* by M. Bigourdan, Paris Observatory :—

| Date.      | Paris Mean Time. |    |    | App. R.A. |    |       | App. Decl. |      |    |      |
|------------|------------------|----|----|-----------|----|-------|------------|------|----|------|
|            | h.               | m. | s. | h.        | m. | s.    | °          | '    | "  |      |
| Nov. 9 ... | 7                | 59 | 25 | 0         | 45 | 55.51 | ...        | + 38 | 19 | 25.8 |
| 9 ...      | 9                | 28 | 6  | 0         | 45 | 53.46 | ...        | + 38 | 19 | 4.5  |
| 13 ...     | 10               | 20 | 1  | 0         | 44 | 3.76  | ...        | + 37 | 53 | 6.2  |
| 13 ...     | 10               | 46 | 32 | 0         | 44 | 3.17  | ...        | + 37 | 52 | 58.7 |
| 13 ...     | 10               | 55 | 43 | 0         | 44 | 3.01  | ...        | + 37 | 52 | 57.9 |
| 13 ...     | 11               | 10 | 49 | 0         | 44 | 2.71  | ...        | + 37 | 52 | 50.6 |
| 13 ...     | 11               | 25 | 6  | 0         | 44 | 2.33  | ...        | + 37 | 52 | 48.6 |

On November 9 the comet was a large and bright nebulosity, perfectly round, and 5'.5 in diameter. It showed a central diffused nucleus, 10' in diameter. A rather brighter portion of an approximately elliptic form appeared to extend from the nucleus in the direction  $\rho = 127^\circ$ , its axes being 1'.5 and 30' respectively. On November 13 the comet was only seen intermittently. It was 8' in diameter and nearly round. The nucleus no longer occupied the centre, but had shifted towards the preceding portion. The elliptical region was 2' by 30', and in the direction  $\rho = 116^\circ.8$ . To the naked eye it was easily visible, being as bright as the Andromeda nebula near it, but less easily distinguished, owing to its smaller apparent size.

The most recent elements and ephemeris have been obtained from observations made on November 9 at Karlsruhe, November 10 at Rome, and November 11 at Göttingen, and are given in *Astronomische Nachrichten*, No. 3128, from which we make the following extract :—

*Elements.*  
 $T = 1892 \text{ August } 15^{\text{h}} 7^{\text{m}} 7^{\text{s}}$  M. T. Berlin.  
 $\omega = 300^\circ 2' 7''$   
 $\Omega = 11^\circ 25' 9''$   
 $i = 27^\circ 34' 0''$   
 $\log q = 9.92222$

} M. Aequator, 1892 0

*Ephemeris for 12h. Berlin M. Time.*

| 1892    | $\alpha$ | $\delta$ | $\log r$ | $\log \Delta$ |
|---------|----------|----------|----------|---------------|
| Nov. 17 | oh. 43.5 | + 37 32  | 0.2562   | 9.9734        |
| ,, 21   | 43.7     | 11       | 0.2688   | 0.0071        |
| ,, 25   | 0 44.7   | + 36 50  | 0.2810   | 0.0387        |

The comet can be easily picked up with a small telescope by knowing that it lies in a line joining the stars  $\beta$  and  $\theta$  Andromedæ, about one-third of the distance from  $\beta$ .

MOTION IN THE LINE OF SIGHT.—The transformation of the great reflector of the Paris Observatory for the purpose of adapting it to the spectroscopic determination of radial velocities is described by M. H. Deslandres (*Comptes rendus* 20). Instead of having a flat mirror at  $45^\circ$ , a collimator was placed in the optic axis itself, and movable along it. The rest of the spectro-scope, which contained three flint prisms and a camera, was enclosed in a rigid steel box attached to the upper ring of the telescope. In order to control the motion, the plates forming the slit were made of polished steel and slightly inclined, so as to throw an image of the sky down into an auxiliary telescope inside the tube, which was provided with a reflecting eye-piece. Thus the observer below, standing near the great mirror, was enabled to keep the star well on the slit. With this arrangement, spectra of stars down to the 4th magnitude could be obtained, 12 cm. long, in two hours. In the blue portion a displacement of 0.005 mm. indicated a velocity of 3.6 km. per second. The lines whose displacements were measured were those of hydrogen, calcium, and iron. 250 stars are within reach of the

instrument. For  $\alpha$  Aurigæ, with a comparison of 30 lines, the velocity was + 43.5 km.  $\beta$  Aurigæ is a spectroscopic double with velocities, on February 5, of - 84 km. and + 97 km. Venus, on April 12, had an actual velocity of 13.55 km. That indicated by the negative was 15 km.

"HIMMEL UND ERDE" FOR NOVEMBER.—The current number of *Himmel und Erde* contains many astronomical articles of interest. "The Heat in August, 1892" is the subject of an article by Prof. W. J. van Bebbber. In this he brings together all the statistics of the temperature readings during the interval between August 11 and 25, and shows by weather charts the general state of the weather, such as wind, barometer, &c. The following few values, showing the highest temperatures recorded and extracted from the table mentioned above, may be of interest :—

| Place.          | Aug. | Temp. Fahr. | Place.          | Aug.  | Temp. Fahr. |
|-----------------|------|-------------|-----------------|-------|-------------|
| London .....    | 23   | 80.6        | Cassel .....    | 17    | 96.8        |
| Oxford .....    | 23   | 77.0        | Grünberg .....  | 19    | 102.2       |
| York .....      | 23   | 73.4        | Karlsruhe ..... | 17    | 96.8        |
| St. Petersburg  | 26   | 86.0        | Bamberg .....   | 18    | 100.4       |
| Stockholm ..... | 26   | 82.4        | Constantinople  | 21    | 100.4       |
| Paris .....     | 18   | 95.0        | Madrid .....    | 16    | 107.6       |
| Biarritz .....  | 16   | 107.6       | ,, .....        | 17    | 107.6       |
| ,, .....        | 17   | 104.0       | Rome .....      | 17—21 | 93.2        |
| Brussel .....   | 18   | 95.0        | Lagouat .....   | 23    | 105.8       |

Dr. J. Scheiner, on "Astronomy of the Invisible," deals with the discovery of the dark companions of Sirius and Procyon. He commences with an historical sketch of the study of the proper motions of the fixed stars and leads up to the most modern observations describing the results obtained with regard to Sirius and Procyon. Prof. Barnard, with the help of two excellent woodcuts, explains the working of the great Lick refractor. To prepare the instrument for micrometric work, he says five minutes is required ; but for photographic work ten minutes is necessary, as a photographic correcting lens has to be adjusted to compensate for the difference between the photographic and optical focus ; the large spectro-scope absorbs nearly half an hour's work before it is ready for observation.

OBSERVATIONS OF PERSEIDS.—During the August display of the Perseids it has been noticed that in addition to the principal radiant point several minor ones have been observed, which although not very far distant from the primary one, are still far enough to suggest that they belong to another swarm of particles following a different track in space. The orbit, which the particles in the main follow, corresponds, as is well known, to that of the comet of 1862 III., and M. Bredikhine has suggested that the particles producing these minor radiant points belong really to the same swarm, only have either been acted on by external forces such as the perturbations of the major planets, or have been projected from the comet itself at different periods.

With the intention of bringing some facts to bear upon this idea, M. Puiseux, in the *Bulletin Astronomique* for October, gives the results of his observations made in August of last year, which seem to confirm those of M. Bredikhine in several points of view.

His method of observation was simply to chart down on a large celestial globe the positions of the trails as observed. A glance at this globe, after 199 positions had been so recorded, indicated that the area of radiation occupied a considerable surface, and extended principally in the directions of right ascensions, that several distinct centres of concentration were observable, and that the same radiant points, in general, manifested their activity at the same time, i.e., on the evenings of August 10, 11, and 12, and some on August 7. In the table accompanying this paper M. Puiseux shows that no less than fourteen different centres of radiation were observed. Table II., which we produce here, contains the essence of the whole work, and shows the positions of the radiant points in question, together with the corresponding elements of the orbits deduced. It must be remembered of course that their values cannot be very accurate, owing to the difficulty of observation, but the results are nevertheless interesting. The different radiant points are denoted by A, B, C, &c., while  $\alpha$  and  $\delta$  represent

their right ascension and declinations ; the other nomenclature is that usually adopted in cometary computations.

|   | $\alpha$ | $\delta$ | $\zeta$ | $b$   | $\Omega$ | $i$    | $q$    | $\omega$ |
|---|----------|----------|---------|-------|----------|--------|--------|----------|
| A | 44°·5    | 49°·1    | 57°·1   | 30°·7 | 138°·6   | 127°·3 | 0·9643 | 296°·2   |
| B | 41°·3    | 46°·7    | 53°·8   | 29°·1 | 138°·0   | 130°·3 | 0·9836 | 302°·3   |
| C | 47°·3    | 39°·7    | 56°·0   | 21°·2 | 139°·0   | 143°·6 | 0·9674 | 297°·8   |
| D | 62°·7    | 60°·6    | 73°·2   | 38°·7 | 138°·5   | 107°·1 | 0·8046 | 265°·6   |
| E | 52°·5    | 53°·4    | 64°·3   | 33°·2 | 138°·1   | 120°·6 | 0·8839 | 277°·9   |
| F | 35°·3    | 65°·8    | 60°·0   | 47°·9 | 138°·7   | 99°·1  | 0·9759 | 298°·9   |
| G | 30°·0    | 43°·4    | 44°·0   | 29°·1 | 138°·4   | 130°·7 | 0·9982 | 330°·3   |
| H | 105°·3   | 60°·9    | 99°·4   | 38°·0 | 138°·7   | 79°·1  | 0·5145 | 230°·2   |
| K | 19°·5    | 28°·4    | 29°·0   | 18°·6 | 138°·7   | 144°·3 | 0·7495 | 19°·2    |
| L | 5°·3     | 67°·0    | 45°·8   | 56°·1 | 138°·6   | 87°·9  | 1·0028 | 322°·3   |
| M | 118°·5   | 53°·2    | 109°·6  | 31°·7 | 138°·7   | 64°·0  | 0·3811 | 215°·0   |
| N | 314°·7   | 67°·4    | 23°·4   | 72°·9 | 137°·9   | 62°·4  | 0·9872 | 330°·8   |
| O | 323°·5   | 50°·1    | 355°·0  | 58°·8 | 138°·7   | 63°·1  | 0·8402 | 5°·7     |
| P | 14°·0    | 37°·4    | 28°·5   | 28°·7 | 138°·5   | 126°·3 | 0·8046 | 11°·9    |

GEOGRAPHICAL NOTES.

THE Royal Geographical Society has determined on a change in the form and alteration in the title of its *Proceedings*, which will materially enhance the value of the monthly publication. The size of each part will be increased to ninety-six pages, and two volumes will be published in the year instead of one as formerly. Internally the arrangement will be slightly altered, and while the strictly geographical character of the publication will be maintained, the notes and record of geographical work from other countries will be made at once more systematic and more popular. A special feature will be the record of the "Geographical Literature" of the month, summarizing all the accessions to the library, both books and memoirs. This will form a subject-index to geographical literature, and serve as a continuous appendix to the exhaustive subject-catalogue of the Society's library which is now being compiled. The editorship of the new series remains in the hands of Mr. J. Scott Keltie, the assistant secretary.

WITH reference to the note on the death of Lieutenant Schwatka, the Alaskan explorer, published last week, we are glad to observe that an official enquiry negatived the theory of suicide, and showed that the fatal result followed from an overdose of morphia taken medicinally.

THE German colonial authorities have recently come to a very important decision as to the official spelling of the place names of their various protectorates in Africa and New Guinea. European names are to retain their ordinary form, but all native names are to be rendered phonetically according to a new set of rules. These rules so closely resemble those put forward by the Royal Geographical Society, and now widely used, that it appears possible by some slight concessions on both sides to make one set serve both for English and German. The letters *c, q, x,* and *z* are dispensed with as redundant, *c* and *z* being rendered by *ts, x* by *ks,* and *q* by *kw.* The guttural *ch* becomes *kh,* the English *ch* being given as *tsh,* and the sound of the English *j* as *dj.* The German *j* sound will be represented by *y,* and the letter *j* used only for the French sound, which is represented in English as *zh.* The German sound of *w* is rendered as *v,* the letter *w* being kept for the English sound. Unfortunately the letter *s* is kept for its soft German sound, the sharp sound of the English letter being shown by *s.* The use of the English *s* would have overcome this difficulty, and removed the most serious obstacle to a common orthography.

CAPTAIN MONTEIL, whose arrival at Kano on his way to Lake Chad was referred to in May last (vol. xlv. p. 110), has at last been heard of, and his mission, although involving two years of travel in the Sudan and Sahara, appears to be successfully completed. The facts could not be put more concisely than in Monteil's official telegram to the French Foreign Office, which arrived on November 15:—"October 17. To-day I entered the territory of Fezzan by way of Tejerri coming from Kuka. Having set out from Kano on February 19, I reached Kuka on April 10, where the reception was excellent. I left Kuka on August 15 with a guide, sent by the Sheikh to accompany me to Murzuk . . . which I expect to reach on or about the 25th, and to stay there just long enough to arrange my departure for Tripoli. Badaire has borne the

journey exceedingly well. My men are all with me, except two left at Kuka." This is the most important journey through the Central Sudan and Sahara since the classical explorations of Barth and Rohlfs.

STROMBOLI IN 1891.<sup>1</sup>

STROMBOLI is one of the most noted but least studied of volcanoes. The regularity of the weak explosions which, succeeding each other at intervals of a few minutes, characterize its normal state, gives rise to the idea that its action is always thus uniform and monotonous, and the occasional paroxysms to which it is subject are apt to be overlooked. In reality the so-called Strombolian phase of volcanic activity differs from the Plinian phase exhibited by Vesuvius and certain other volcanoes merely by the absence of intervals of perfect repose between the violent outbursts which are characteristic of the latter type. It is in this difference that the explanation of the fact is to be found, that from time immemorial no explosion in any way comparable to the great explosions of Vesuvius have occurred at Stromboli ; for the ceaseless activity of the latter prevents the accumulation of sufficient force to produce a powerful and destructive effect. But from time to time the throat of the volcano does get more or less choked, and the efforts of the imprisoned vapour to escape result in an eruptive phase of some violence. Such an event took place during the latter months of last year, and the following description of the phenomena is based on the observations of Profs. Ricco and Mercalli, and of Ing. Arcidiacono.

The state of the volcano preceding this outburst had been one of relative calm for two years. In October, 1888, an explosion had opened three new mouths on the upper edge of the Sciarà del Fuoco, from one of which lava was emitted. This was the commencement of a period of increased activity, with repeated issue of lava, lasting nine months till June, 1889. From this date to the eruption of last year, and particularly during the six months just preceding, the activity was less than normal. It is to be noticed, however, that there were two short intervals of recrudescence, lasting only a few days, at the end of December, 1890, and January, 1891.

On June 24, 1891, at 12.45 p.m., two strong earthquake shocks were felt over the whole island at an interval of a few seconds. Loud rumblings and a violent explosion followed each. The shocks were not confined to the island of Stromboli, but were felt at Salina, a distance of 40 kilometres. Even the subterranean rumblings were heard at the latter island. The first shock and the first explosion were, as might be expected, more violent than any which succeeded. Windows were broken at the semaphore station, and a great precipice of rock fell into the sea at the Filo del Cane, and other rocks in the same locality were so loosened that they fell on following days. Two powerful columns of ash, like thick smoke, arose from the crater and ascended far above the summit of the island. Great masses of scoria were ejected and fell toward the northern part of the island, burning the grass and fig-trees. A boat passing to the north-east of the island at the time of the first explosion could not see the semaphore signals, owing to the quantity of ash in the atmosphere. Lapilli fell around the eruptive mouths for a radius of a kilometre and a half, and a fine, dark grey ash rained over the whole island. A stream of lava issued from a point on the Sciarà del Fuoco near to the most western mouth, and a deep fissure formed its upper rim nearly in the same place as that of November, 1882. For two days the lava continued to flow, and loud explosions were frequent. The rumblings were almost continuous. On the 26th the emission of ash ceased, but moderately vigorous outbursts occurred with the ejection of incandescent scoria till the 27th ; but on the 28th and 29th the volcano had resumed its wonted calm. On the 30th, however, a fresh earthquake, accompanied by rumblings and a violent explosion, showed that the volcanic forces were not yet spent. An immense column of vapour and incandescent materials arose from a new breach on the edge of the Sciarà, while an abundant current of lava flowed down the slope reaching the sea at its foot. The whole of the powerful explosions of the 30th were repeated at short intervals, but the activity

<sup>1</sup> Sopra il Periodo eruttivo dello Stromboli cominciato il 24 giugno, 1891. Relazione dei Prof. A. Ricco e G. Mercalli col Appendice dell' Ingegnere Arcidiacono. ("Annali dell' Ufficio Centrale Meteorologico e Geodinamico" [2] XI. Pt. 3, 1892.)