

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

	α	δ	ζ	b	Ω	i	q	ω
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, g, x,* and *z* are dispensed with as redundant, *c* and *z* being rendered by *ts, x* by *ks,* and *g* 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 1891.¹

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

¹ 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 Centrali Meteorologico e Geodinamico" [2] XI. Pt. 3, 1892.)

gradually declined till July 4, when its normal state was reached. The eruptions were again violent, with emission of lava from the 16th to the 23rd of July.

The mouths on the edge of the Sciara, which were contemporaneously active during the above period, were four in number—two at the northern end and two at the western end. One of the former pair was opened by the explosion of June 30, and from it was ejected the greater part of the detrital material of the eruption, so that around it a cone has been built up, truncated by a crater, sub-elliptical in form, of about 60 metres in maximum diameter. The height of this new cone above the old edge of the Sciara is about 50 metres. The other crater is situated on the deep fissure mentioned above, and at night, from the sea the incandescent lava could be seen in free communication with the atmosphere—a circumstance which explains the fact that the explosions from this crater were rare and of feeble intensity. The two western ones were situated one below the other with an interval of about 30 metres. Near the lowest, three large fumaroles gave forth dense columns of steam, while other lesser fumaroles were plentifully scattered about. The majority of the explosions took place from these two mouths. During this same period, lava was emitted three times, (1) on June 24, soon after the first two explosions from the most western part of the Sciara; (2) on June 30, from the crater on the fissure; (3) on July 16, from the central part of the Sciara, between the first two. They all reached the sea, and since the second stream doubled itself round an obstacle about half way in its course, four new points were formed on the shore. The thickness of the lava at these points varied from 4 to 6 metres. Specimens of the lava collected from the most western stream showed that it consisted of an almost homogeneous blackish-brown paste, compact in the interior, but becoming more and more porous and reddish in colour towards the exterior. Some of the larger cavities were internally covered with a shining brown patina. Externally it was covered with a rough crust, reddish-brown in colour, and of scoriaceous aspect. It was sensibly attracted by the magnet, and melted without effervescence to a brownish-green glass. Crystals of plagioclase, augite and olivine were apparent. In section, about two-thirds was rendered opaque and black by very minute microlitic granules of magnetite which were intimately mixed with a transparent glassy base, colourless or inclining to greenish. The remaining third consisted of a great number of colourless transparent microlites of plagioclase. Fluidal structure was only just apparent. In this microlitic paste were scattered crystals of plagioclase, augite, and olivine. The augites were greenish in section and possessed a feeble pleochroism. The olivines were corroded and irregularly fractured.

Analysis gave the following numbers:—

	Stromboli.	Etna. Mean of analyses of 20 modern lavas.
Silica ...	50.71	49.45
Alumina ...	13.99	19.30
Ferric oxide ...	5.13	11.82
Ferrous oxide ...	9.10	
Manganous oxide42	—
Lime ...	10.81	10.21
Magnesia ...	4.06	3.69
Potash ...	3.02	1.33
Soda ...	2.87	3.58
Loss on ignition24	—
Cl and SO ₂ (traces)	—	—
	100.35	99.38

The lava is similar to other lavas of Stromboli, and to show the great similarity between the lavas of Stromboli and Etna, the mean of the numbers of twenty analyses of modern Etna lavas is appended for comparison.

The scoria, lapilli, and ash of the eruption present no special features, but are what might be expected from a lava of the above composition.

Although the volcano had reached a state of comparative calm at the end of July, this did not last for very long. Towards the end of August fresh signs of activity gave warning of an approaching explosion, which took place on August 31. It was preceded by an earthquake a few seconds before, and as a result a vast column of ash rose above the volcano, while scoria and other projectiles were shot out to a considerable distance. Soon after, a fine ash, dark red in colour (instead of black as in

June-July), fell over the island, covering the ground in some places to a depth of several centimetres. On the evening of September 1 dense columns of ash were again emitted, and in the afternoon of September 3 the whole crater was enveloped in a thick mantle of steam, in the midst of which could be dimly seen a reddish-grey column of ash rising with extraordinary violence to a great height, when it spread out into a volcanic "pine." A fresh stream of lava was also observed. Eruptions succeeded each other at short intervals, accompanied by continuous rumblings, interrupted now and again by loud explosions, like heavy artillery. As far as could be observed, on the western side of the crater was a single mouth of almost circular form, 10 metres in diameter, which was most active in sending up vast columns of ash and projectiles of all kinds. To the east could be seen one or more little mouths, which tranquilly emitted large volumes of steam, while in the midst a large aperture, 30 metres in diameter, irregular in form and deeply fissured, was in powerful action. The activity, however, gradually quieted down, and towards the end of the year the volcano resumed its normal state.

In conclusion, it is useful to compare this eruptive phase of Stromboli with other contemporaneous seismo-volcanic phenomena of the Italian peninsula. It appears that earthquakes occurred in various districts in the early months of 1891, especially one on June 7 in the Verona district, rather severe, occasioning loss of life. Vesuvius was rather more active than usual during the whole of June, and in correspondence with this the great fumarole of the solfatara at Pozzuoli, increased in temperature. It is particularly interesting to note that Vulcano, the other active volcano of the Lipari Islands, remained in perfect calm during the whole period, emitting only vapour from the fumaroles. As, however, the character of the eruptions and the lithological composition of the material ejected from this volcano differ so greatly from those of Stromboli, it is tolerably certain that there is no free and direct communication between the reservoirs of these two volcanoes. In fact, Stromboli presents a much greater analogy with Etna. The similarity of the lithological composition of the lavas of these two volcanoes has already been referred to, and, further, Prof. Mercalli observes that the last four or five eruptions of Etna have all been immediately preceded or followed by a paroxysm at Stromboli. It is thus possible that there is a real relation between them.

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A LARGE METEORITE FROM WESTERN AUSTRALIA.

IN the *Mineralogical Magazine and Journal of the Mineralogical Society* of July, 1887 (vol. vii.) Mr. L. Fletcher M.A., F.R.S., president of the Society, describes four specimens of a new meteoric iron found at Younegin in Western Australia. They were discovered about three-quarters of a mile to the north-west from the top of Penkarrig Rock, in the above district, about seventy miles from York. These fragments were found by Alfred Eaton, a mounted police constable, when on duty in the district of Younegin, when he brought in one of the four pieces he found on January 5, 1884. Mr. Fletcher states that the late Mr. Edward T. Hardman, F.G.S., the then Government geologist, expressed his belief in the meteoric origin of these iron masses. Later the above-named Alfred Eaton was sent with a native assistant with instructions to bring in the other three pieces, and at the same time an unsuccessful search was made for additional fragments. In the above account it is stated that the four pieces were lying loose on the surface, three of them close together, and the fourth fifteen feet away. They weighed respectively 25½ lbs., 24 lbs., 17½ lbs., and 6 lbs., the largest and smallest fragments are now in the British Museum collection, and the specimen of 24 lbs. is in the Geological Museum at Freemantle, and the fourth piece, weighing 17½ lbs., was presented to the Melbourne Museum in Victoria.

The new specimen now in my possession was discovered last year, and weighs 382½ lbs., and measures 22½ inches high, 20½ inches wide, and 13¼ inches in its greatest thickness. In form it is roughly convex on one side and concave on the other, on both sides of which are large depressions or pittings similar to those usually observed on other large masses of meteoric iron. It is somewhat triangular in outline, but with irregular sides. It has one small hole quite through the mass near the top, and numerous deep holes, one near the bottom left-hand corner