and here a north-west line was struck, and for two days the upper edge of the forest was skirted. On the second day Johnston's old camp was reached, where in the water-courses an abundance of large Ericaceous plants was found growing. Here the two beautiful peaks were seen for the first time, and thenceforth only partial glimpses were obtained through the prevailing clouds. Only eight men would go further than this, and when the snow-line was reached five of them refused to go further. On the third day a northerly route was taken over grass-covered lava-fields, with snow-streams sometimes cutting their channels 50 metres deep into the lava. Dr. Meyer made for the saddle which joins the two peaks of Kibo on the west and Kimawenzi on the east. After 6000 paces a level spur of the saddle was reached, where between the great blocks of lava the green meadows marked the upper course of the snow-streams. Here the last traces were seen of *Senecio Johnstoni* in the bed of a brook about 4000 metres high. About 2000 paces further up great cliffs of lava were met with, and here at the snow-line the tent was pitched. Thence, with his companion and three natives, photographic apparatus, and provisions for three days, Dr. Meyer proceeded to ascend to the Kibo crater. After 3000 paces a wild and shattered hill of lava, whence the lava-stream proceeded, was met with; this was the first of a series of such hills, between which the snow lay thick. Turning to the north-west the party made direct for Kibo over the old lava-streams, and at about 5000 metres reached the last cone of ashes before the ascent to the summit itself. Here the two white men encamped (the natives going back), with a night temperature of -11° C. Early next morning they made directly for the east side of the mountain over debris-covered lava, and came on great snow-fields in the spaces between the lava-hills. After a time sleet came on, and, as the sun got higher, clouds covered the mountain, and the temperature fell from $+8^{\circ}$ C. to -3° . Dr. Meyer's companion became so exhausted he had to drop behind, and he himself suffered greatly. Proceeding onwards, he met with more extensive snow-fields, and higher still with great ice-blocks, and a less steep stretch covered with ice-debris. Some 20 metres beyond this point he saw a great blue wall of ice rise before him to about 34 or 40 metres high, and evidently stretching all round the crater. In Dr. Meyer's exhausted condition, and without ice-axes, to ascend this wall, which evidently surrounded the crater, was impossible. So, after taking some hasty observations and notes, he began his descent, which was accomplished safely. As the wall seems to extend round the east, south, and west sides of the crater, Dr. Meyer concludes that probably the crater itself is filled with ice. It is remarkable that no snow seems to exist at all on the north side. Dr. Meyer promises to give full details on his return home to Leipzig, and these may render his account more intelligible to Alpinists.

OTHER articles in the new number are on "Temperature Abnormalities on the Earth's Surface," by Herr Rudolf Spitaler, accompanied by a map illustrative of the paper; and "Production of Tin in the Riouw-Tongga Archipelago," by Dr. Posewitz.

LIEUT. WISSMANN, whose health is not good, has given a preliminary account of his journey across Africa to the Berlin Geographical Society. He began with a very brief sketch of the first part of his journeyings, which consisted of his first voyage up the Kassai. By his last journey up the Kassai he has determined that its largest tributary is the Kwango. The Sankuru has only half the volume of water possessed by the Kassai above the confluence of the two rivers. From Lulua-burg, Wissmann began his great forward march to the north of the Sankuru and Lomami. A lengthened stay was made on the Lubi, and after crossing the Sankuru the party entered the region of virgin forests. These were found partially peopled by the savage Batetela and the Batua, the latter being the pygmies described in a previous number. Turning south, Wissmann passed through the territory of the marauding Ben Mona, and where on a former journey he found gigantic villages he now found the place depopulated by war and small-pox. From Nyangwe, Wissmann reached the East Coast by Lakes Tanganyika and Nyassa, and the Zambesi. The latter part of the route was through hitherto unexplored territory. Lieut. Wissmann has been compelled to go to Madeira on account of his health, but we believe there is some likelihood of his appearing at the Royal Geographical Society some time next spring.

FROM the full report of recent explorations in Tierra del Fuego, to which we have recently referred in these notes, we have some further information as to the real character of the

region. The reports refer chiefly to the main island, which, instead of being a mountainous region of eternal snow, presents great diversity of surface—high mountains, deep valleys, rolling table-lands, fertile plains, numerous lakes, and frequent water-courses. Occupying a large portion of the extreme north, and extending from one extremity to the other of the straits, are continuous chains of mountains, running into peaks several thousand feet high. Adjacent to these mountains on the south is a wide belt of high and rather barren plain, running the entire width of the island. Then succeed lofty table-lands quite covered with forests. South of this is another chain of sierras, and still further south the country opens into an extensive plain, which occupies all the central portion of the island, and is quite desolate of trees except small patches here and there of hardwood and shrubs. The plain is covered in some parts with an abundance of rich grasses. The extreme south is also mountainous, some of the peaks being volcanic, with numerous glaciers and dense forests. The geological formation of Tierra del Fuego exactly corresponds to that of Patagonia. The broken and disjointed mountains, with wide seas running where they have been depressed, are but the continuation of the Andes; while the plains and uplands partake of the same geological characteristics as the Patagonian steppes.

AT Monday's meeting of the Royal Geographical Society the paper read was by Mr. D. D. Daly on his explorations in British North Borneo, in 1833-87. Mr. Daly's paper consisted mainly of an itinerary with minute details of the economic character of the country through which he travelled, and of the people. He gives some interesting information about the numerous bird-nest caves which he met with, and on the methods of collecting the nests. Most of the people are eager head-hunters, but Mr. Daly made treaties with several of the tribes in which they undertook to give over the practice. Mr. Daly went in both from the east and the west side. In the former journey he went up the River Kinabatangan to the centre of North Borneo; in the latter he went a long distance up the Padas River.

ON THE METEORIC IRON WHICH FELL NEAR CABIN CREEK, JOHNSON COUNTY, ARKANSAS, MARCH 27, 1885.¹

THE Johnson County meteoric iron, the teeth whose fall has been observed, is of more than ordinary interest, because its fall is so well substantiated, because it is the second largest mass ever seen to fall, and, again, because it fell within five months of the date of the ninth recorded fall, that of the Mazapil. It is almost an exact counterpart of the Hraschina (Agram, Croatia) iron, the first of the recorded falls. The Agram iron fell in two fragments, one weighing about 40 kgm., and the other about 9 kgm., the combined weight being about equal to that of the Johnson County iron.

This mass fell about 6 miles east of Cabin Creek, Johnson County, Arkansas, in longitude $93^{\circ} 17'$ W. of Greenwich, latitude $35^{\circ} 24'$ N., within 75 yards of the house of Christopher C. Shandy. Mrs. Shandy states that about 3 o'clock on the afternoon of March 27, 1886, while in her house, she heard a very loud report, which caused the dishes in the closet to rattle, and which she described as louder than any thunder she had ever heard. At first she thought it was caused by a bombshell, and ran out of the house in time to see the limbs fall from the top of a tall pine-tree, which, she says, stands about 75 yards from her dwelling. She did not investigate the matter until her husband came home, about 6 o'clock in the evening, when, in company with John R. Norton, their hired man, they went out to find the cause of the noise that had so startled Mrs. Shandy. They discovered that a large hole had been made in the ground by some falling object. The iron had buried itself in the ground to the depth of 3 feet, and the earth around it to the thickness of 1 inch seemed to be burned. The ground was still warm when the iron was taken out, and the iron itself was as hot as the men could well handle.

The noise was heard 75 miles away, and was likened to a loud report, followed by a hissing sound, as if hot metal had come in contact with water. It caused a general alarm among the people, and teams of horses 25 miles distant, becoming frightened, broke loose and ran away; and in Webb City, Franklin County, on the south side of the Arkansas River, a number of bells kept on sale in a store are said to have been

¹ From the *American Journal of Science*, vol. xxxiii., Jun.: 1887.

caused to tinkle. Cabin Creek is on the north side of the Arkansas River.

Mr. B. Caraway says it was heard by fully 1000 people, and that he heard two loud reports at Alma, Crawford County, 75 miles away, at 3 o'clock on March 27, 1886. The report was

also heard at Russellville, and in the adjoining county of Pope.

Prof. H. A. Newton, who has kindly interested himself in this matter, says that the data furnished indicate that the mass must have fallen nearly from the zenith. This was the direction

FIG. 1.—Upper Side.

FIG. 2.—Lower Side.

Johnson County, Arkansas. (Scale two-ninths.)

of the end of its path, the earlier portion being more inclined to the vertical, as the path must be affected by gravity and the resistance of the air. The earlier direction must have been from the north-east, and more nearly from the east than the north.

The mass is in general quite flat and very irregular, resembling strongly a mass of molten metal thrown on the ground and then pitted. The illustration of the Agram² mass figured

² "Beiträge zur Geschichte und Kenntniss Meteorischer Stein- und Metall-massen," by Dr. Carl von Schreibers. Wien, 1820, folio, plate viii.

by Von Schreibers could be mistaken for the upper side of this, were it not that this is larger. It measures $17\frac{1}{2}$ inches (44 cm.) by $15\frac{1}{2}$ inches (39 cm.), while the Agram measures $15\frac{1}{2}$ by 12 inches. A high ridge, 5 inches high at the highest point (12.5 cm.), runs through the centre. One half of the mass is not over 3 inches (7.5 cm.) thick, part of it is only 2 inches (5 cm.), and around the edge it is only 1 inch, or less. It is only exceeded in size, among the irons seen to fall, by the Nejed, Central Arabia, now in the British Museum, which fell in the spring of 1865, and weighs 59,420 kgm. The weight is $107\frac{1}{2}$ lbs. (48,750 kgm.), and it is intact with the exception of three small points, weighing not more than 2 ounces in all, which were broken off. One of these is seen in the etched figure, another was sent to Prof. Clarke by Colonel Betten to be analyzed, and the third piece was lost.

The two sides are wholly dissimilar (see Figs. 1 and 2¹). In fact, one would scarcely suppose that they belonged to the same mass. The upper side is ridged and deeply dented, while the lower side is flat and covered with shallow but very large pittings. On top the colour is in many places almost tin white without any coating whatever, and the pittings are very deep, and usually quite long, like finger depressions made in potters' clay. These depressions measure from 2 cm. to 4 cm., and from 1 cm. to 4 cm. This side is remarkable for striæ showing the flow and burning, and all running from the centre toward the edge, identical with those in the Rowton, Nedagolla, and Mazapil irons, but on a larger scale. Some of them are thinner than a hair, and yet twice as high (like a high knife-edge), and they are from 1 to 4 inches long. In one space of 5 cm. twenty are arranged side by side, and on one small part which is black, there are fifty lines in 1 inch of space (25 mm.), all running in the same direction. Near all the pointed edges the fused metal has flowed and cooled, so as to hang like falling water. The striæ and marks of flowing are around the edges of the upper surface (Fig. 1). On the under side pittings are very shallow,

FIG. 3.

but much broader, one depression, apparently made up of four pittings, being 20 cm. long, and 9.5 cm. wide. The whole side is coated with a black crust, 1 mm. thick, and having minute round bead-like markings. On one of the indentations of the lower edge the crust has a strikingly fused appearance, as if a flame had been blown on it from the other side. In reality this edge is undoubtedly the place where a greater amount of burning took place when the body was passing through the air. Seven small, bead-like lumps, from 5 mm. to 10 mm. in size, which are visible on this side, are drops of metal that were entirely melted, and flowed and cooled so that they resemble drops of a thick liquid. There are also to be seen what appear to be cracks, fifteen in number, and nearly as thin as a hair. One of these is 10 cm. long, and extends from the highly-fused edge above mentioned towards the centre. The others are from 3 cm. to 5 cm. long. These are so evenly arranged that they are without doubt *Reichenbach lamellen*, in which the inner troilite has been burnt out. If such is the case, they are as abundant as in the Staunton (Va.) meteoric iron.

On the upper side ten nodules of troilite are exposed, measuring from 33 mm. in diameter, to 55 mm. long, and 25 mm. wide. On the lower side there are twelve such nodules exposed, 13 mm. in diameter, while the largest measures 19 mm. by 39 mm. On the upper side these nodules are coated in spots with a black crust, similar to that found on the mass, but on the lower side the crust extends completely around the side of the nodules, showing the fusion very plainly. The troilite is very bright and fresh, like a newly broken mineral, and on the upper side one of the nodules shows deep striation, suggesting that the entire nodule is one crystal, and the exposed part is only one side of it. In some cases where the nodules were broken, they were found to be iridescent. This is one of the octahedral irons showing the Widmanstätten figures beautifully on etching (see Fig. 3), and is one of the Caillite groups of Stanislas Meunier and of the

mittlere lamellen of Brezina. The lamellæ are 1 mm. wide, and the markings more closely approach the Rowton¹ and Mazapil² irons. Fig. 4 shows the etching on the surface of the unpolished exterior, there being no crust. The lower end of the figure, which is flat, was produced by the hammering off of the piece; but the etching was really finer where it was done on the natural surface of the iron. The specific gravity of the small piece figured is 7.773. Troilite, as before stated, is very abundant in the mass. Schreibersite and carbon have also been found

FIG. 4.

between the laminae. Chlorine is present only in slight quantity, as scarcely any deliquescence has been observed.

The following is a comparative table of analyses of meteoric irons most nearly approaching this in composition:—

	Cabin Creek (Whitfield).	Estherville (Smith).	Mazapil (Mackintosh).	Rowton (Flight).	Charlotte (Smith).
Iron ...	91.87	92.00	91.26	91.25	91.15
Nickel ...	6.60	7.10	7.845	8.582	8.05
Cobalt ...	trace	0.69	0.653	0.371	0.72
Phosphorus ...	0.41	0.112	0.30	—	0.06
C, S, &c.	0.54	99.902	100.038	100.203	99.98
	99.42				

GEORGE F. KUNZ.

THE ROYAL HORTICULTURAL SOCIETY.

THE Council of the Royal Horticultural Society request the horticulturists of the United Kingdom to read and consider the following statement and appeal:—

1. The grounds at South Kensington, known as the Gardens of the Royal Horticultural Society, having been devoted to the Imperial Institute, the Council endeavoured, in obedience to the wishes so graciously expressed by Her Majesty the Queen, the Patron of the Society, to obtain from the Royal Commissioners of the 1851 Exhibition such a site as would justify them in advising the Fellows to remain at South Kensington.

2. The Royal Commissioners were, however, unable to offer any adequate site, and gave the Council distinctly to understand that the erection of offices, committee-rooms, &c., on their land would not be held to confer any claim whatever, either legal or moral, to the use of the Conservatory and Gardens for the purposes of the Society. The negotiations consequently came to an end. An informal offer has since been made by the Royal Commissioners to let a portion of the Gardens and the Conservatory to the Society at a guaranteed rent of £1000 a year, which with rates, taxes, and maintenance would involve an expenditure of £2000 a year at least, a sum far beyond the resources of the Society.

3. The Society has been in existence for eighty three years, having been founded in 1804, and incorporated by Royal Charter in 1809. It has done much to advance the interests of practical and scientific horticulture, and it is the recognized authority on all horticultural questions. In addition to the valuable work of the Scientific Committee, presided over by Sir J. D. Hooker, K.C.S.I., C.B., F.R.S., new and rare plants, fruits, and vegetables, collected abroad or raised at home, have been continually submitted, in large and increasing numbers, to the judgment of the Fruit and Floral Committees, whose verdicts are accepted without question. The Society has also continuously carried on valuable trials of plants, fruits, and vegetables, at Chiswick. It has published during the last three years the following, viz.:—"Report of the National Apple Congress held at Chiswick, October 1883," "Report of the Orchid Conference held at South Kensington, May 1885," "Report of the National Pear

¹ These figures were made by the Ives process, and are faithful reproductions direct from the photograph.

² "Meteoriten Sammlung des k.k. mineralogisches Hofcabinet in Wien." Wien, 1885, 8vo, Plate 2, Fig. 2.

³ American Journal of Science, III. vol. xxxiii. p. 225, Fig. 2.