

Abruzzi. Mr. Forsyth-Major made an expedition into this district with the object of identifying the so-called "Chamois" of the inhabitants, and ascertained that this animal, now nearly extinct, was either the chamois of the Alps or a closely allied form. At Isola del Gran Sasso he was shown the horns and skin of an example shot in 1878. The present existence of the chamois so far south in Italy, although mentioned in several works, has not been previously authenticated.

MOVEMENT IN THE LEAVES OF CONIFERS.—Dr. Maxwell Masters (Linnean Society, December 4) has called attention to the contrasts to be drawn between the leaves of the spruce firs (*Picea*) and those of the silver firs (*Abies*) as regards their arrangement, relative position, form, relative size, and internal structure, as described by Bertrand, MacNab, Chatin, and others. The leaves of the silver firs are endowed with a power of motion in virtue of which they are raised or depressed. On the other hand, the leaves of the spruces are comparatively motionless. In those cases where the leaves have the power of movement there is usually a well-marked layer of "palisade cells" which are absent in the motionless leaves. This circumstance has led Dr. Masters to correlate the differences before alluded to with varying degrees of functional activity, and with the adaptations manifested to secure as far as possible to each leaf an equally favourable amount of exposure to light, &c. The very remarkable movements of revolving nutation observable in the "leader shoots" of many conifers during their season of active growth were mentioned as having been investigated by him and the rotation duly registered on a disk.

GEOLOGICAL NOTES

CRUSTACEA IN THE OLD RED SANDSTONE.—The occurrence of eurypterid crustaceans of the genus *Pterygotus* in the Tilestones of Herefordshire and Worcestershire, and in the Old Red Sandstone of Forfarshire, has long been well known. These organisms have been regarded as characteristic of that section of geological time in the British area represented by the Ludlow and Lower Old Red Sandstone formations. Murchison used their presence in the Arbroath flagstones as an argument for placing these strata in his "Lower" division of the Old Red Sandstone, while on the other hand he argued from their absence in the Caithness flagstones and from the dissimilarity of the fishes, that these northern deposits must be of later age. He therefore classed the great flagstone series of Caithness and the Orkney Islands as "Middle" Old Red Sandstone, thus bringing this series of formations into correspondence with his favourite threefold classification of the Devonian system. Recently, however, in the first part of his memoir "On the Old Red Sandstone of Western Europe," published in the *Transactions of the Royal Society of Edinburgh*, Prof. Geikie has pointed out that the contrast between the fish fauna of the Arbroath flagstones, or the ancient basin which he terms "Lake Caledonia" and that of the northern basin or "Lake Orcadie," is by no means so marked as Murchison believed, and that the characteristic *Pterygotus*, on which the author of "*Siluria*" laid so much stress as an Upper Silurian and Lower Old Red Sandstone type, occurs on several horizons and at different localities in the Caithness and Orkney basin. An important discovery confirmatory of the extension of these crustacea into the northern area has recently been made by Mr. James Linn in the course of the Geological Survey of Elginshire, now in progress. From the valley of the Spey he has obtained numerous fragments of what must have been a remarkably large *Pterygotus*, though the specimens so far found hardly admit of specific identification with the *P. anglicus* of Forfarshire. *Pterygotus* has thus been discovered in Orkney, Caithness, and on the Moray Firth, not only over an extensive geographical area, but throughout a wide vertical range of strata. These crustaceans must evidently have had a considerable and prolonged development in the waters of the northern basin of the Lower Old Red Sandstone period.

SALSES OF MOUNT ETNA.—As the result of his recent observations among the mud volcanoes of Paternò on Etna, Dr. A. von Lasaulx gives the following conclusions:—1. The Salses arise from the association of gaseous volcanic emanations with spring-water traversing easily soluble strata in which common salt, gypsum, lime, and other salts occur. 2. The carburetted hydrogen escaping in connection with the salses is produced by the same volcanic emanations with the co-operation of these strata. 3. The so-called eruptions of the mud-volcanoes are

merely the squeezing out under pressure of the dissolved and loosened parts of strata, that are disturbed and dislocated by underground movements.

NEW JURASSIC REPTILES.—Prof. Marsh announces in the *American Journal of Science* the arrival at Yale of numerous remains of reptiles from the Jurassic deposits of the Rocky Mountains. He finds that they belong to several distinct groups and throw considerable light on forms already described from the same horizon. Among them he briefly describes a new genus under the name of *Camptonotus*, most nearly allied to *Laosaurus*, and forming with it a distinct family, the *Laosauridae*. The name of the genus is taken from the fact that, as in *Laosaurus*, the sacral vertebrae are not co-ossified, while some of the other vertebrae even in the same specimen have their neural arches so completely united to the centra that the suture is nearly or quite obliterated. The known remains of *C. dispar* indicate, according to Prof. Marsh, a herbivorous animal about eight or ten feet high. Another species, about three times as large, is named *C. amplius*. One of the largest reptiles yet known (*Brontosaurus*) has recently been brought to light from the same region. It probably belongs to the *Sauropoda*, but has a sacrum composed of five thoroughly co-ossified vertebrae. Fresh specimens have been obtained throwing much new light on the structure of *Stegosaurus*. This dinosaur was covered with huge dermal plates, some of which ranged from two to three feet in diameter. The remains of a much smaller reptile, about the size of a wolf, apparently also a Dinosaur, and probably carnivorous, are included in a new genus, *Celurus*.

GEOGRAPHICAL NOTES

News has been received of Herr Carl Boch, on his return to the coast after his travels in the centre of Borneo. He has been up the Klintjouw River as far as Longwai, and thirty miles beyond where no European has yet penetrated. There is, however, but little to see, and the dead silence of an almost uninhabited forest prevails beyond Longwai. The birds of this district, with five or six exceptions, are the same as those found in the highlands of Sumatra. Herr Boch has made some very interesting observations on the inhabitants of those districts, of which he is preparing an account. The Dyaks of the interior are far more wild and savage than those of the coast, and are not, as a rule, partial to seeing strangers, but appear to offer them no harm in times of peace. They are, however, veritable "head hunters," and talk about it in a very free and easy manner. The Rajah, with whom Herr Boch had dealings, had a collection of six, taken from Dyaks of another tribe, not in open fight, but by treachery when they were asleep. A more interesting race, also head hunters, however, and still further removed from civilisation, are the Orang Poonan, or forest people. With these strange border-beings, who construct no houses, but live in the open forest, Herr Boch seems to have made himself quite friends, and regards them as good and honest people—always excepting the little eccentricity in the matter of heads. They are not dark, but fair, and of a yellowish complexion, and as they have allowed Herr Boch to take sketches of both sexes, these will doubtless afford much further interesting information. He proposes now to cross the island from east to west, coming out at Band-jermassing.

A CORRESPONDENT supplies us with the following translation of a letter from Dr. Gerhard Rohlfs, concerning his recent journey in Africa, which may interest our readers. The letter addressed to a German friend, is dated Benghazi, November 10: "When you receive these lines I shall no doubt be in Italy, and, therefore, back in Europe. Your last letter of July 9 I received at Kufra, when I was free again, and already on my return journey. . . . I hope that Stecker, my young companion, will again take up the expedition. The Sueya have partly returned our property, part they are still going to return, and part the Turkish Government will compensate us. If Stecker proceeds by way of Sella and Mursuk, he will probably not encounter too many difficulties. I may communicate to you the statistical fact that the distance between Battifal and Taiserbo is about 400 kilometres. We travelled over this distance in exactly 100 consecutive hours, certainly a great feat. Thus we cleared more than 90 kilometres per day. It must be remembered that this was done on foot and on camels, then it will be appreciated. We hardly slept at all, only in the evenings and mornings we

rested for awhile. But then who would have thought that Kufra lies $1\frac{1}{2}$ more to the south than is indicated on the maps? that Kufra is the largest oasis but one of the Sahara? that of all oases Kufra contains the largest *uninterrupted* areas of arable land. Are there *uninterrupted* areas at Fesan extending over 200 kilometres? Or at Tuat, or at Taflet? No! And everywhere the finest water. There may be about 1,000,000 palm trees in the oasis, and if Kufra is otherwise poor as regards variety of species of plants, it is all the richer in numbers of plants of one and the same species. I have not reached Wadai on my tour. Thus I have not even been able to reach the basis upon which my operations were really to begin. But it is not my fault. I have the consciousness of having fully done my duty."

THE King of Sweden has expressed his wish that after the *Vega* has reached Naples Prof. Nordenskjöld and Lieut. Falander should, on their trip overland, visit several geographical societies on the continent. At Copenhagen they are to rejoin their ship, and with it proceed to Stockholm.

AT the last meeting of the Halle Geographical Society, the President, Dr. Kirchhoff, announced the formation of a geographical union amongst the students at that University, this being the first union of the kind. It is hoped that the students at other universities will imitate this commendable example. Later on at the same meeting Dr. Lilienfeld read a highly interesting paper on the South African diamond fields which he visited last year.

DR. OSCAR LENZ writes from Tetuan, under date of November 27, as follows:—"I arrived at Tangiers in excellent health. After having made excursions from this place in all directions, I travelled to Tetuan, which is highly interesting and situated most beautifully, and which was particularly attractive to me in a geological sense. For several days past I have been trying to start in a southerly direction for the Shishuan district, which has never before been visited by a Christian, but I have not yet obtained permission from the Caliph; it is stated that the inhabitants are in open revolt against the Sultan, also that the Kabyl tribes are extremely fanatical and will not tolerate any Christians in their country. Between December 4 and 8 I expect again to be at Tangiers, from which place I shall send a detailed report of my interesting journey to the African Society. Then I shall prepare for a prolonged sojourn in the interior. About New Year's Day I hope to be at Fez."

THE January number of *Petermann's Mittheilungen* contains a detailed account, by Prof. Veth, of the Dutch expedition to Sumatra. He gives a statement of the literature relating to Sumatra previous to the expedition, a sketch of its programme, the results of Schouw Santvoort's expedition, and those of his own and Hassel's journeys in Rawas, Lebong, and Lemun, concluding with a sketch of the important Balang Hari river. A fine large map of part of Sumatra accompanies the paper. This is followed by a paper on the Sanpu river of Tibet, with a map from English sources. There is also a narrative of the recent voyage of the Dutch vessel, *Willem Barents* to the Barents Sea, also with a map, which is followed by one of Dr. Emin Bey's valuable narratives, describing his journeys between the Victoria and Albert Nyanza in 1878. We are glad to see from the monthly summary that the publication of the narrative of Baron von Der Decken's travels in East Africa, 1859-65, has at last been concluded.

A GRANT of 4,000*l.* has been made by the Minister of Public Instruction at Paris, to the French Committee of the International African Association, in order to enable them to establish two stations similar to those which the Belgian expeditions are about to found in Eastern Africa. One of these will be placed in the Ogowe region, and will probably be under the command of M. Savorgnan de Brazza, already well known for his explorations in that quarter. It is expected that the other station will be established in Usagara, on the eastern side of the continent. It had previously been proposed that M. de Brazza should lead an expedition from the Gaboon towards Lake Chad, and it is not impossible that there may be some further modification of the present projects.

In the letters which, after long delays, have at length reached the London Missionary Society from Ujiji, Mr. Hore gives some account of his explorations on Lake Tanganyika and its adjacent rivers. In March apparently he explored the coasts of Ujiji, Ukuranga, and Ukawendi, and the Malagarasi and Kibwe rivers. At the end of April he started on another voyage, during which

he visited Uguhha and explored the mouth of the Lukuga River; this he declares is the veritable outlet of the lake. Mr. Hore descended the river in a canoe as far as where the Mitwanse—now swept away—used to be, and landed at Stanley's farthest. He then walked for six hours, and mounted the Kijanka ridge, which is farther down the river than Stanley places it. He slept there, getting the latitude by stars and good bearings; and from above where he landed he had a glorious bird's-eye view of the river far into Urua. He states that the so-called Lukuga Creek is a wide and very swift river. With regard to Uguhha, Mr. Hore says that, by general consent, it is the gateway from Lake Tanganyika to the west.

THE new number of the Geographical Society's periodical contains only one paper, Capt. A. H. Markham's account of his Arctic cruise of 1879, in the Barents Sea; it has been rendered inordinately long by the introduction of many pages of irrelevant matter. It has, however, a redeeming feature, in that it is illustrated by two useful maps.

THE new *Bulletin* of the Belgian Geographical Society furnishes some interesting information in its "Chronique Géographique," more particularly in regard to the various expeditions of the International African Association, from which we gather that another expedition will before long leave Zanzibar for the interior. It is especially worthy of note, however, that no information is allowed to leak out respecting Mr. H. M. Stanley's proceedings on the Lower Congo, on which subject and his plans the Central Committee maintains a discreet silence.

WE have received Parts 9, 10, and 11 of the new edition of Stieler's Hand Atlas.

PHYSICAL NOTES

WE learn that Mr. Edison is attempting to construct a portable electric lamp which shall, including the constant battery employed to generate the current, be no larger than an ordinary moderator lamp.

THE *Scientific American* states that the story of Edison's telephone having been used over 2,000 miles of line is incorrect; the messages were transmitted over the greater part of the line by telegraph, and only over the last few miles in Pennsylvania by telephone.

A MEASURING polariscope, specially adapted for examining the angles between the optic axes of crystals upon the plan suggested a few months ago by Prof. W. G. Adams, has been constructed by Herr E. Schneider, and is described in Carl's *Repertorium*.

THE study of the spirit level has been continued by M. Plantamour. He has shown that the bubble of very accurately adjusted levels is continually moving; indicating a continual gently rising and falling of the earth's crust.

A SINGULAR phenomenon of atmospheric electricity during a snow storm was observed at Cherbourg on November 20, by M. Delamare. At about half-past five in the evening the snow-flakes fell so quickly that it was perfectly dark. M. Delamare, walking along under the shelter of his umbrella, heard a faint buzzing sound as of insects flying around, and at the same moment observed a pale luminous "brush" proceeding from the extremity of each of the ribs of his umbrella. On extending his finger towards one rib the brush-discharges ceased, and he received a continuous stream of faint sparks. It would be interesting to learn whether the handle of the umbrella was of ivory or any material of specially good insulating properties.

M. GUÉBHARD has recently shown an elegant method of procuring iridescent rings in a permanent form. These rings, which are, like Newton's rings, due to interference giving rise to the "colours of thin plates," differ however from Newton's rings in reversing the order of the colours, that corresponding to greatest thickness being at the centre. M. Guébard drops a little collodion on to the surface of mercury. It is drawn out on all sides into a thin film of iridescent hue, which when hard may be floated off on to paper. Ten years ago the writer of this note similarly fixed on paper iridescent films obtained by dropping mastic varnish on to the surface of water. M. Guébard produces similar rings, though of no permanency, with drops of volatile mineral oil on the surface of mercury, or even by the film of moisture condensed from the breath. At the meeting of the *Société de Physique* of Paris, on December 5, these experiments were shown by pro-