

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. Liliensfeld 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 Shishuun 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 ridge. He then walked for six hours, and mounted the Kijanka farthest, 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-

jection upon the screen; and M. Guebard awakened a lively interest when he proceeded to show that such films, especially the fleeting films condensed from the breath, may exhibit phonoscopic properties. The various vowels being pronounced so that the breath impinges on the surface of the cooled mercury, rings are obtained having certain forms more or less strongly characteristic of their different qualities of tone.

THE influence of temperature on tuning forks (which are now such valuable aids to research), has been lately investigated by Herr Kayser (*Ann. de Phys.* No. 11), and by the method of observing the alteration of the difference of phase of two forks with the temperature. The forks were furnished with mirrors and the Lissajous figures observed with a telescope. These results were arrived at: 1. The vibration number of a tuning-fork is, between 0° and 30° , a linear function of the temperature. 2. The influence of temperature is greater, the higher the tone of the fork, and with similarly arranged forks, the variation of the vibration number is about proportional to the square root of that number. 3. With moderate variations of temperature, such as occur in a room, the temperature affects the vibration number in the second place of decimals. 4. The co-efficient of elasticity of steel increases between 0° and 30° with the temperature.

OBACH proved, a few years since, that alloys of the metals proper, such as lead and tin, potassium and sodium, and sodium amalgam, conduct a current, without being decomposed. Herr Elsässer has recently (*Ann. der Phys.* No. 11) experimented with combinations of metals with the half-metallic elements antimony and bismuth, passing a current through the fused alloy in a glass tube with electrodes of gas carbon. There was here also no decomposition. The author notes that the transition from these compound conductors of the first class to the electrolytes, is no sudden one. Between the two groups are substances, which at a low temperature conduct without decomposition, but at a high one, and even partly before they melt, are electrolysed, e.g. copper and silver sulphides, and the sulphides of lead, nickel, iron, bismuth, tin, and antimony. To this middle class, also, may be added a number of compounds, which have not hitherto been electrolysed, probably because they are so difficult to fuse (such as the oxides of tin, iron, and chromium); the electrolytes proper do not conduct without being electrolysed; and to this class belong especially the haloid compounds of the metals, which are not decomposed in the solid state because they are insulators; whenever they begin to conduct, being fused, they are decomposed. Lastly there is a fourth class of compounds, which in general do not conduct, either with or without decomposition.

AN experimental determination of the indices of refraction of some liquefied gases has been lately made by Herr Bleekrode (*Ann. der Phys.* No. 11). He used the method of Faraday's tubes, but observed the liquefied gas with a microscope in a small vessel with plane parallel sides having mirror plates. Only cyanogen, carbonic acid, and ammonia, were thus successfully examined, and the average numbers obtained for these were, severally 1.320, 1.163, and 1.314. The method is also useful for compounds which are liquid at ordinary temperature, but difficult to examine on account of their inflammability. Thus, the author applied it to zinc-ethyl, obtaining the number 1.489. *A propos* of the index of carbonic acid, Herr Bleekrode has some interesting remarks on liquid inclosures in certain minerals. In another paper he hopes shortly to give the indices of most of the other liquefied gases, his experiments on which were, in part, accomplished with Cailletet's compression apparatus.

THE somewhat doubtful name *Audiphone* has been given by Mr. Rhodes of Chicago to an instrument to improve the hearing powers of the partially deaf. We understand that it consists essentially of a flat flexible disk of resonant metal furnished with a handle, like a palm leaf fan and capable of being adjusted in curvature by means of a cord and a tightening clamp. The edge of the disk is to be pressed against the upper front teeth while its concave surface is presented towards the speaker to receive the sounds. The vibrations thus taken up by the disk are transmitted through the teeth and bones of the skull to the auditory nerves. This would appear to be a more practical instrument than the megaphone of Mr. Edison, of which nothing has been heard of late, or the apparatus recently explained by M. Paul Bert to the *Académie des Sciences*. Mr. J. Samuelson of Liverpool, exhibited the Audiphone at the late *soirée* of the associated scientific societies held in the St. George's Hall.

PROF. C. S. HASTINGS of the Johns Hopkins University has contributed to the current number of *Silliman's Journal* an important paper on "Triple Objectives with Complete Colour Correction." He controverts the opinion of Prof. Harkness expressed in a preceding number of the journal that the focal plane of a system of lenses does not correspond to the minimum focal distance.

It is stated that a new photographic process has just been discovered in Japan by an inventor whose name is not given. One of the substances employed in the manufacture of Japanese lacquer has the property of becoming almost as hard as stone under the action of light. A slab covered with this material and duly exposed behind a photographic "negative" for some twelve hours, was afterwards scraped, and rubbed with spatula and brush, leaving the hardened portions raised in low relief, and capable of being used as a block for printing.

OUR contemporary, the *Electrician*, announces the startling discovery of an electric divining-rod, "whereby paying deposits of gold, silver, and copper can be positively indicated, and their exact location pointed out." This "discovery" is of course a trans-Atlantic one, but, "strange to say, it does not emanate this time from Menlo Park, though Mr. Edison may of course have prevented it many years ago!"

IN the *Institutes of Akbar*, whose reign over a considerable part of India extended from 1560 to 1600, are found the following directions for the artificial freezing of water. Into two parts of water is thrown one part of dry powdered nitre. In this mixture a small stoppered silvered jug containing pure water is stirred about briskly for a quarter of an hour, when its contents will be found to be wholly or partially frozen.

SCIENTIFIC SERIALS

Journal of the Royal Microscopical Society, vol. ii. Nos. 7 and 7a, contains:—Transactions of the Society.—W. H. Gilbert, On the morphology of vegetable tissues (Plates 22 and 23).—J. Beck, On the structure of the scale of a species of the genus *Mormo*.—Prof. E. Abbe, On new methods for improving spherical correction, applied to the construction of wide-angled object-glasses.—H. E. Forrest, On the anatomy of *Leptodora hyalina* (Plates 24 and 25).—Dr. H. Stolterfoth, On a new species of *Eucampia*.—John Mayall, jun., On an immersion stage illuminator, and on aperture measurements of immersion objectives expressed as "numerical aperture."—J. W. Stephenson, On a table of numerical apertures showing the equivalent angles of aperture of dry, water immersion, and homogeneous immersion objectives, with their respective resolving powers, taking the wave-length of line *Z* as the basis; $a = n \sin w$, n = refractive index, and $w = \frac{1}{2}$ angle of aperture.—The record of current researches relating to zoology, botany, and microscopy.—Bibliography.—Proceedings of the Society.—The editor announces that the Society has obtained the assistance of Mr. T. Jeffery Parker, Mr. A. W. Bennett, and Prof. F. Jeffrey Bell in the production of the journal.—No. 7a is a supplementary number containing the index to vol. ii., List of Fellows of the Society, &c.

Proceedings of the Boston Society of Natural History, vol. xx. part 2, November, 1878, to April, 1879.—Dr. H. A. Hagen, Larvæ of insects discharged through the urethra, and On birds swarming after white ants.—Dr. S. Kneeland, Traces of the Mediterranean nations in the Northern Ocean.—Dr. H. A. Hagen, Remarks on white ants.—President Bouvé, Remarks on the death of Dr. J. B. S. Jackson.—Prof. N. S. Shaler, Evidences of a gradual passage from sedimentary to volcanic rocks in the Brighton district.—Dr. H. A. Hagen, Flies from a petroleum lake.—W. O. Crosby, Occurrence of fossiliferous boulders in the drift of Truro, Cape Cod.—Dr. S. Hunt, On the pre-Cambrian rocks of Great Britain.—W. H. Patton, Synopsis of the New England species of Colletes.—J. S. Kingsley, Notes of North American Decapoda.—W. P. Crosby, A possible origin of petro-silicious rocks.—B. D. Halsted, The American species of Characæ. The author enumerates eight species of *Nitella*, one of *Tolypella*, and nine of *Chara*, one of which, *C. robbinsii*, from Rhode Island, is described as new.—Dr. C. S. Minot, Growth as a function of cells, and On certain laws of histological differentiation.—Rev. G. F. Wright, The kames and moraines of New England.—Mr. W. Upham, Glacial drift of Boston and vicinity.