closed by means of strips of fur, and dried interiorly with chloride or calcium, so that in all weathers the machine acts well.

HERR ZEHFUSS has lately given (*Wied. Ann.*, 4) some personal experiences of the phenomenon of "after images of motion" (about which Plateau and Oppel have before written). These after images may be had, *e.g.*, in a train, if one look at a point on the horizon for a little, then turn to look at (say) a horizontal fibre in the wood of the carriage, or close one's eyes. Motions then seem to be still perceived; in the latter case, *e.g.*, a stream of sparks seems to be moving to the right (or if the point originally looked at have been between the observer and the horizon, there is a stream of sparks above going to the right and one below to the left). Herr Zehfuss offers a physiological explanation, in preference to the partly psychical ones proposed by Plateau and Oppel. Each individual nerve rod, he supposes, has special blood-vessels, which, when the original image of a moved object goes to the right, directs the course of the blood to that side, just as in ordinary light the decomposed blood is promptly replaced by fresh. By this preponderant direction of blood to the right a heaping up occurs in each retinal element on the right, which gives rise to return currents as soon as the outer cause has ceased to act. As the blood flows back there arise, in consequence of the specific excitability of the rods, those spark-streams, which are projected as elementary motions to the right.

IN a recent number of *Wiedemann's Annalen* (3) Herr Schönn describes a method of making visible ultra-violet prismatically decomposed light in such a way that exact measurements can be made. One feature of it is the use of a disk of fine calking paper saturated with sulphate of quinine, and contained in a small cell which is brought close before the Ramsden ocular, which can be directed at once on the disk and on a luminous line (its axis is not inclined like that of Soret's, but coincides with the axis of the telescope). The author gives measurements of the ultra-violet spectrum of cadmium, zinc, and thallium.—In the same number Herr Glan describes a "spectro-telescope," with which objects can be seen in any homogeneous colour at will. The instrument has various applications, especially in astrophysics.

IN a paper on the thermic theory of the galvanic current (*Wied. Ann.*, No. 4) Herr Hoorweg lays down the following propositions:—Wherever two conductors come into contact, motion of heat results in development of electricity; therefore a constant electric difference arises between the two substances. 2. If in a closed circuit, the total sum of the differences of potential be different from zero, there arises in this circuit a continuous electric current. 3. This current exists at the cost of the heat at one part of the point of contact, and has heat-production in the other for a result. 4. All voltaic currents are thermo-currents. 5. The chemical action in the battery and the decomposition apparatuses is a result of the galvanic current.

AN interesting series of experiments has been recently made by Dr. König on the vibrations of a normal tuning-fork (*Wied. Ann.*, No. 3). He finds that, practically, at least to 50° to 60° of heat, the influence of heat on a tuning-fork may be regarded as constant. Thick tuning-forks are more affected by heat than thin ones of the same pitch, indicating (it is remarked) that change of elasticity, and not change of the length of the arms, is the primary cause of the change of pitch. The influence of heat on tuning forks of different pitch, and of not very different thickness, is proportional to their number of vibrations. Generally the period of vibration of a tuning-fork is increased or diminished $\frac{1}{8000}$ by a difference of temperature of 1° centigrade. The general change in pitch of the normal fork $Ut_3 = 512$ vibrations per second at 20°, through the temperature difference of 1° C. is 0·0572 vibrations per second. Dr. König has constructed a fork which, at any temperature, will exactly give 512 vibrations.

SOME quotations by Herr Oehler (*Wied. Ann.*, No. 3) from Jacob Hermann's work, "Phoronomia sive de Viribus," &c., published in 1716, have a curious significance in relation to the history of the mechanical theory of heat. In the twenty-fourth chapter, "De motu intestino fluidorum," the following paragraph occurs:—"Hoc nomine non intelligitur hoc loco internus molecularum motus fluidi cujuscunque in suo statu naturali consistentis, sed is particularum motus, qui in fluidis a causis externis et accidentalibus excitari solet, quo calor præsertim est referendus, qui dubio procul ex concitatiore particularum motu in corpore calido a causis externis producitur. Utut vero ejusmodi motus intestinus admodum perturbatus sit, nihilo tamen minus regula physice satis accurata pro ejus mensura media tradi potest. In another place Hermann offers a demonstration of the theorem that "Calor, cæteris paribus, est in composita ratione ex densitate corporis calidi, et duplicata ratione agitationis particularum ejusdem."

GEOGRAPHICAL NOTES

LIEUT. A. LOUIS PALANDER, of the Swedish Royal Navy, was last week elected a Corresponding Member of the French Geographical Society, in acknowledgment of his brilliant services to geography as commander of the *Vega* during the late Arctic Expedition. We understand that the Swedish Royal Academy of Sciences have just caused a handsome bronze medal to be struck in commemoration of the successful accomplishment of this enterprise. This medal shows on one side the heads of Prof. Nordenskjöld and Lieut. Palander, and on the other a well-executed representation of the *Vega* surrounded by ice.

AT the Anniversary Meeting of the Geographical Society, on Monday next, the Earl of Northbrook will take the chair for the last time, and will deliver an address on recent geographical progress. The formal presentation of the Royal Medals will also take place at this meeting, though neither of the recipients (Lieut. Palander and Mr. Ernest Giles) can be present. The Duke of Edinburgh, Honorary President of the Society, will preside at the Anniversary Dinner in the evening, which will be held, as usual, at Willis's Rooms.

LORD ABERDARE, it is understood, will succeed the Earl of Northbrook as President of the Geographical Society.

A BEGINNING is about to be made to carry out Lieut. Weyprecht's proposal for a circle of observing stations around the North Polar region. The Danish Government has resolved to establish a station at Upernivik, in West Greenland; the Russian Government has granted a subsidy for an observatory at the mouth of the Lena, and another on the new Siberian Islands; Count Wilczek is to defray the expenses of a station on Novaya Zemlya under the direction of Lieut. Weyprecht; the U.S. Signal Service, under General Myer, has received permission to plant an observatory at Point Barrow, in Alaska; and it is expected that Canada will have a similar establishment on some point of her Arctic coast. At the Hamburg Conference it was announced that Holland would furnish the funds for a station in Spitzbergen; and it is expected that Norway will have an observing post on the extremity of the Province of Finmark. This is a good beginning, and we hope that some sort of agreement will be established to have all the observations made after a uniform method, otherwise their value will be greatly decreased.

BARON EGGERS, of St. Thomas, West Indies, sends is a prospectus of a plan for the scientific exploration of the West Indies, especially as regards their natural history, his main purpose evidently being to make complete collections of plants, insects, and shells. Such collections he offers at certain rates to all who express their wish to become subscribers, the subscription to be paid on delivery of the collections. Details may be obtained from Baron Eggers or from his agent in Europe, Dr. Eug. Warming, Copenhagen.

M. PAUL SOLEILLET, who was compelled to return to Senegal in his attempt to reach Timbuctoo, is now in Paris, and expresses his determination to embark again in July, to make another attempt.

A SOCIETY of Geography for the north of France has been established at Douai.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The election to the Professorship of Mineralogy, vacant by the death of Dr. W. H. Miller, F.R.S., will be held in the Senate House on June 12.

In the fourteenth Annual Report of the Museums and Lecture-Room Syndicate, Lord Rayleigh, the recently-appointed Professor of Experimental Physics, says:—"On visiting the Cavendish Laboratory in December last, after my appointment to the Professorship of Experimental Physics, I was at once struck with the