

the kind assistance of Sir E. Sabine, been provided with a set of magnetic instruments by which the connection of terrestrial magnetism with the most violent of our tropical storms may be thoroughly investigated.

SCIENTIFIC SERIALS

THE *Monthly Microscopical Journal* for this month commences with a paper by Mr. W. H. Dallinger and Dr. Drysdale, entitled "Researches on the Life History of a Cercomonad: a lesson in Biogenesis,"—in which they describe, as the result of a very thorough and long-continued series of observations, the life history of a new Cercomonad, which is thus summarised:—"When mature, it multiplies by fission for a period extending over from two to eight days. It then becomes peculiarly amœboid; two individuals coalesce, slowly increase in size, and become a tightly distended cyst. The cyst bursts, and incalculable hosts of immeasurably small sporules are poured out, as if in a viscid fluid, and densely packed; these are scattered, slowly enlarge, acquire flagella, become active, attain rapidly the parent form, and once more increase by fission." They show also that the granules can withstand a temperature much higher than can the mature forms.—Dr. Royston-Pigott makes remarks on the Confirmation given by Dr. Colonel Woodward to the "Colour test," which comes into play in proving that spherical aberration is reduced to a minimum in objectives.—Dr. Dawson remarks on Mr. Carruthers' views of Protaxites, the latter author having described it as a gigantic seaweed, called by him *Nematophycus*. Dr. Dawson gives further reasons for maintaining his original opinion that it is [phenogamous.—Prof. Rupert Jones continues his excellent papers on Ancient Water-flees of the Ostracodous and Phyllopodous tribes (Bivalve Entomostraca). This is followed by an article on the pathological relations of the diphtheritic membrane and the croupous cast, by Mr. Jabez Hogg, which would have been more in place in a medical journal. The Wenham-Toller controversy is maintained by the latter and some others, and there are abstracts of several interesting papers, with notices of Vol. III. of Stricker's *Histological Manual* and Dr. Frey's work on the microscope.

Foggendorff's Annalen der Physik und Chemie; No. 4, 1873.—In this number appears the sixth of the series of papers on internal friction of gases, by O. E. Meyer and F. Springmühl. The authors, having formerly examined the transpiration of atmospheric air through capillary tubes, have further observed that of carbonic acid, of oxygen, and of hydrogen, and find the Poiseuille law to hold good for these gases also. In most of the experiments the gas streamed from one vessel into another containing the same gas at lower pressure; but the case of a gas streaming into a vessel containing another kind of gas was also examined. The velocity of transpiration proved the same, and there was no counter-current of the second gas through the capillary tube, as in the case of diffusion. In an appended note the authors criticise some experiments of von Lang.—Dr. Röntgen gives details of a careful determination of the relation of specific heat at constant pressure to that at constant volume, for the gases, air, carbonic acid, and hydrogen; the mean numbers obtained being 1.4053, 1.3052, and 1.3852 respectively. The writer discusses these results in their bearing on the mechanical equivalent of heat, and the velocity of sound, and compares the work of previous experimenters on the subject.—The concluding part of a paper by F. Rudorff on solubility of salt mixtures appears in this number; and A. Potier replies to certain strictures, by Quincke, on some recent observations of his, as to reflection from metals and glass. Among the remaining matter may be noted an important memoir by G. Rose (communicated to the Berlin Academy), on the behaviour of the diamond and graphite on being heated. The author describes and illustrates the regular forms produced in the diamond through combustion, treats of the general heating effects where air is excluded and where it is not, the natural blackening of diamonds, the so-called carbonate, and connected topics.—A note by F. Zöllner, detailing further experiments to show that electrical currents are produced by current water (a statement which was questioned by Beetz a short time since), also deserves attention.

Der Naturforscher, June 1873.—Among the more important papers in this issue we may note the account of Pettenkofer and Voit's recent researches on the value of fat as a nutritive substance. They find that fat is very largely absorbed from the alimentary canal, but after long feeding with great quantities of

fat the absorption becomes less; also that (contrary to a common opinion), fat is much more readily decomposed into simpler products than albumen. The decomposition of food-fat depends on that of albumen, on the amount of albumen present, and on the proportion of it fixed in the organs, to what is in circulation. The results given in this memoir have an important practical bearing. Another physiological paper treats of the influence of food on the structure of digestive organs: the experimenter, H. Crampe, thinks that the nature of food, alone, affords no sufficient explanation of the differences found in these.—An article on the loss of free nitrogen in putrefaction describes some interesting experiments by Messrs. König and Kiesow. In physics and chemistry we find notes on the change of length and electricity produced by the galvanic battery, on the action of electricity on carbon compounds, on Dr. Gladstone's new air battery, on the action of electrical force on non-conductors, &c.—There are two French astronomical papers, one on an attempt to measure the diameter of Sirius; the other, on MM. Cornu and Baille's new determination of the mean density of the earth. Geology, meteorology, and other branches of science, are also represented.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, July 28.—M. de Quatrefages, president, in the chair.—The following papers were read:—On the exponential function, by M. Hermite.—An examination of the theory of the thrust of earthworks against their sustaining walls, by M. de Saint-Venant. This was a criticism on M. Curie's late papers on this subject.—On a proposed regular service of train transports between Dover and Calais, by M. Dupuy de Lôme. The author, in conjunction with Mr. Scott Russell, has devised a method of transporting entire trains by means of large steamers. Part of the paper was devoted to a project of a new port west of Calais, as that place is useless for the purpose; at Dover everything is ready for such a purpose, there being now 40 ft. of water at the end of the Admiralty pier at low tide. The proposed scheme would be able to carry 800,000 passengers, and 870,000 tons of goods annually.—On electric cauterisation applied to surgery, by M. Sédillot.—New researches on the solar diameter, by Father Secchi. The author had found the sun's diameter, observed spectroscopically in the lines C and B, to be less than that given by the Nautical Almanac; he hence advocated the use of monochromatic images for making such determinations, and replied to some objections of S. Respighi, who, on repeating these experiments, agreed with the almanac.—M. Lédieu's paper on thermo-dynamics was continued.—On a new method of condensing liquefiable bodies held in suspension in gases, by MM. Pelouze and Audouin.—On different forms of curves of the fourth order, by M. H. G. Zeuthen.—On the respiration of submerged aquatic vegetables, by MM. P. Schützenberger and F. Quinquaud.—On the structure of the cerebral ganglia of *Zonites algirus*, by M. H. Sicard.—On the planet Mars, by M. C. Flammarion.—On a new system of pneumatic telegraphy, by MM. D. Tommasi and R. F. Michel.

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