discharge of electric condensers, by S. Emilio Villari.—Report on the antiquities recently discovered in Val della Torre, Adria, Forli, Orvieto, and other parts of Italy, by S. Fiorelli.

SOCIETIES AND ACADEMIES

PARIS

Academy of Sciences, October 29.—M. Blanchard, president, in the chair.—Allusion was made by the President to the loss sustained by the Academy in the person of M. Louis Breguet, the mechanician, who died suddenly on the night of October 26.—Observations on the geometrical deformations produced by pressure on a rectangular parallelopipedon with prolongation in a single direction (two illustrations), by M. Tresca.—Fossil and savage man; anthropological studies, by M. de Quatrefages. In presenting this important work to the Academy, the author remarked that since the discoveries of Boucher de Perthes and the jawbone of Moulin-Quignon some twenty years ago, not only has the existence of Quaternary man been universally recognised, but a certain number of distinct Quaternary races has already been determined. The existence of Tertiary man also, without being yet fully demonstrated, has been rendered highly probable, especially by the researches of M. Capellini. A detailed account is given of all the known Quaternary races of Western Europe, based mainly on the fossil remains collected by M. de Baye in the artificial caves explored by him in the department of La Marne.—Note on the freezing point of alcoholic solutions, by M. F. M. Raoult. In accordance with the general law established by the author, the soluble bases are shown to belong to two distinct groups, one presenting a molecular lowering of the freezing point comprised between 33° and 48°, with a mean of 39°; the other lying between 16° and 20°, with a mean of 19°.—Report on the results of the treatment of the vines attacked by phylloxera in the Maritime Alps, by M. Laugier. The report speaks favourably of the experiments made during the years 1881-83 with sulphuret of carbon and sulphocarbonate of potassium.—On certain equations connected with surfaces of constant curvature, by M. G. Darboux.—Determination of the equivalent of nickel by means of its sulphate, by M. H. Daubigny.—On a process for detecting by chemical analysis the traces of blood in clothes that have been washed, by M. C. Husson.—A comparative study of the excitability of the surface and deeper parts of the brain, by M. Couty.—On the spermatogenesis of podophthalmous crustaceans, and especially of the decapods, by M. G. Herrmann.—Note on the anatomy and physiology of the Sacculine and the allied genera Peltogaster and Lernæodiscus, by M. Yves Delage.

BERLIN

Physical Society, October 19.—Dr. Frölich made a report on measurements of solar heat executed by him in continuation of observations he had made at an earlier date, according to the method he was still pursuing, on the temperature of celestial space. Observations on the temperature of the earth's surface had led him to the conviction that solar heat, the principal source of the temperature of the earth, must pass through very rapid oscillations, which were in all probability connected with the quick movements on the solar surface that had been brought to light by the new methods of investigation. To establish these variations beyond all doubt required long-continued observations of the sun's heat by means of trustworthy instruments remaining invariable for years. Thermoelectric piles provided with due protective apparatus could alone be deemed instruments of this description. Mr. Langley's bolometer was not adequate for any length of time, the electric resistance of thin metal plates being liable to very rapid variations. The thermoelectric pile he had made use of was inclosed in a wide, double-walled pipe, opening in front in the shape of a funnel, in which circulated a constant stream of water of atmospheric temperature. The exposed front end of the thermopile was closed by a plate of rock salt, and the whole was set up in such a manner that it could turn in a frame, which itself might be turned in all directions and closed by means of a Venetian shutter. The whole apparatus was capable of revolving in all directions. The thermopile and the galvanometer of Siemens and Halske's recent construction were perfectly trustworthy instruments, as Dr. Frölich had repeatedly convinced himself. There now remained the task of finding a standard for the solar heat. For this purpose preparatory experiments were instituted with luminous heat generators—a glowing platina sheet and an electrical glow-lamp of older construction. These experiments, however, came to nothing. At last recourse was had to dark heat, such as was produced from a hollow screen filled with steam, one side of which is blackened with smoke, and the other whitened with chalk. With these apparatus measurements of solar heat were taken on perfectly clear days under a bright sun at very different points of the sun's altitude, and were represented by curves, the abscissæ of which showed the thickness of the transmitted atmosphere; the ordinates, the observed warmth of the sun. Under favourable conditions the curve formed a straight line, which, when extended to zero of the abscissa, furnished the measurement of the solar heat without atmospheric absorption. The measurements were at first attempted to be taken at the Berlin Observatory, but were found to present so many irregularities and oscillations in consequence of the situation of the Observatory in the midst of the city and the constantly vaporous and dusty state of the atmosphere surrounding it that they had to be discontinued there. Better and more regular results were obtained from observations made at a house in the western suburbs. The best and most conclusive measurements, however, in which the errors of observation were reduced to 1 per cent., were obtained from a tower in the West End near Berlin, where, throughout six days of the past summer, curves were registered approximating very closely to a straight line. One single measurement executed on the Faulhorn at a height of 9000 feet yielded a perfectly straight curve. The six measurements distributed over the months of June, July, August, September, and October, showed considerably different results in the different months. Dr. Frölich caused Dr. Lohse, who had been taking daily photographs of the sun at the Potsdam Observatory, to supply him with data regarding the presence of sunspots in the last months. From these data Dr. Frölich found that the lower degrees of solar heat corresponded with numerous formations of spots, while the higher gradations of heat were attended with fewer sunspots. In this coincidence Dr. Frölich was disposed to see a sequence of cause and effect. It would be necessary, however, to accumulate a large number of observations, and in particular to take them at elevated stations before any definitive judgment could be passed respecting the influence of sunspots on solar heat.

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