C. Vincent. The results of the author's researches are : (1) The separation of the three normal propylamines ; (2) the discovery of nitrosodipropylamine ; (3) the determination of the physical constants of di- and tripropylamine and of nitrosodipropylamine. —On a new creatinine (ethylamido-acetocyamidine), and on the formation of the creatinines and creatines, by M. E. Duvillier. From the author's experiments it follows, so far, that the action of cyanimide on the starch acids consists essentially in the formation of creatinines, that of creatines taking place only in a very few cases.—On a combination of stannic chloride with hydrochloric acid (chlorostannic acid), by M. R. Engel.—On the alcoholate of potassa, by M. E. J. Maumené. Referring to M. Engel's note in the last issue of the *Comptes Rendus*, the author points out that he had already determined and announced an alcoholate of potassa so far back as the year 1872 (*Les Mondes*, December 19, 1872).—Note on the antennæ of the Eunicians, by M. Et. Jourdan.—On the effects of pollinisation in the orchid family, by M. Léon Guignard. A series of experiments is described which the author has carried out for the purpose of determining the varying interval which intervenes between pollinisation and fertilisation in this group of plants.—On the amphibolic schists and gneiss, and on the limestones of Southern Andalusia, by MM. Ch. Barrois and Alb. Offret.—Fresh experiments with balloon photography : ascent of MM. A. and G. Tissandier and P. Nadar, by M. G. Tissandier. During this ascent, which took place on July 2, and lasted nearly six hours, the altitude never exceeding 1700 metres, M. Nadar took no less than thirty instantaneous photographs ; of these about a dozen constitute undoubtedly the finest series of negatives yet obtained from a balloon. Amongst them were two views of Versailles at 800 metres ; one of Sèvres at 600 metres ; one of Ballème (Orme) at 900 metres ; several perspectives of Saint-Remy (Sarthe), some at 1200 metres. During a second ascent the following week, M. Nadar secured three good views of Champigny and the banks of the Marne. These experiments place beyond all doubt the success of aërial photographic operations.

Berlin

Physical Society, June 4.—Dr. Pringsheim spoke on a new application of the telephone for the measurement of electrical resistances, a purpose for which it had already been brought into use by Prof. Kohlrausch in cases in which the resistances were measured by means of alternating currents—in cases, that is, of fluid conductors and also in the case of wires. Dr. Pringsheim had, however, observed that in the measurement of wire-resistances by means of alternating currents the determinations by the telephone did not always concur with those of the galvanometer, and varied very much with repeated measurements. He therefore applied the telephone for measurement by means of a constant current, and that in the following manner. In the Wheatstone bridge the circuit usually occupied by the galvanometer was of constant resistance. The four sides of the wire arrangement contained the wire the resistance of which required to be measured, and the rheostat. The two free angles of the square were connected by a wire circuit in which was placed a telephone. So long as the resistances of the two sides of the bridge were not perfectly equal, a part of the current flowed through the telephone circuit, and each time this was opened a snapping was heard in the telephone. The rheostat resistance was then changed till nothing was heard on opening the telephone circuit. The sensitiveness of this method was equal to 0·04 per cent. of the total resistance.—Prof. von Helmholtz reported on his most recent investigations, which respected the "doctrine of the maximum economy of action," and communicated the interesting history of the understanding of this principle. The doctrine was first propounded by Maupertuis in 1744 in a treatise laid before the Paris Academy. This treatise contained, however, no general statement of the proposition, nor did it define the limits of its applicability, but only adduced an example. This example was, in accordance with the present state of our knowledge, not pertinent, and had no relation to the principle of the *actio minima*. Two years later Maupertuis propounded his principle before the Berlin Academy, proclaimed it to be a universal law of nature and the first scientific proof of the existence of God. On this occasion, too, he did not prove the proposition nor determine the limits of its applicability, but only supported it by two examples, one of which alone was correct. This principle, propounded with such grand solemnity, but so weakly supported, was violently attacked by König of Leipzig, and just as keenly defended by Euler. This mathematician likewise failed to furnish the proof, which was not possible till after the investigations of Lagrange. The form in which the principle of the *actio minima* now existed was given to it by Hamilton, and the Hamiltonian principle for ponderable bodies was in complete harmony with the Lagrange propositions. The elder Neumann, Clausius, Maxwell, and the speaker had already extended the Hamiltonian principle to electro-dynamics. For this purpose, and in order to be able to subordinate to it all reversible processes, the speaker had undertaken some transformations of it, and had introduced into it the conception of the "kinetic potential." In the form it had thus attained the Hamiltonian law —the old principle of the *actio minima*—had in point of fact universal validity. It had just as wide an application as had the law of the conservation of energy, and revealed a whole series of mutual relations between the different physical processes. In his communication Prof. von Helmholtz gave only a quite general view of his investigations.

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