observed on August 19, 1887, at Petrovsk, Government of Jaroslav, by M. G. M. Stanoiewitch. Owing to the extremely unfavourable atmospheric conditions the observer was unable to carry out any important part of his programme. A chief result of his observations was the conclusion that the gloom prevailing during eclipses is all the deeper the less clouded is the sky and the flatter the ground, especially on the horizon. The sky the flatter the ground, especially on the horizon. being on this occasion almost completely overcast, he was able to read the title of a pamphlet printed on a red cover at a distance of 2 metres.-On the variations of temperature of gases and vapours which preserve the same quantity of heat under different tensions, by M. Ch. Antoine. A simple means is proposed for avoiding the laborious calculations required to determine the values Θ and Θ^1 in the formula $y = 25\sqrt[3]{\Theta} - \Theta^1$ deduced from V. Regnault's experiments on atmospheric air.---On the energy needed to create a magnetic field and to mag-netize iron, by M. Aimé Witz. The researches here described serve to verify Lamont's statement that the effect produced by a magnetic field on a magnet is greater when the force acts to diminish than it is when the force acts to increase the magnetizing power.—On the rapidity of transformation of meta-phosphoric acid, by M. Paul Sabatier. Solutions of metaphosphoric acid are transformed spontaneously with greater or less rapidity. Berzelius and Thomsen suppose that there is at first production of pyrophosphoric acid, which is afterwards changed to orthophosphoric acid. Others, with Graham, think that there is immediate formation of tribasic orthophosphoric acid, and the author's researches tend to show that this is normally the case. It is also established that the rapidity of transformation is at each instant proportional to the mass of transformable substance present in the system.—On an alloy of titantium, silicium, and aluminium, by M. Lucien Lévy. Wöhler indicated two alloys of these metals without giving their composition. The author here determines a similar alloy differing in some of its properties from those of Wöhler. He has also determined its composition, as apparently a mixture of two isomorphous bodies crystallized together with formula $TiAl_4$ and $SiAl_4$. The same preparation with zinc or magnesium substituted for aluminium yielded no results.—On some derivatives of cinchonine, by MM. E. Jungfleisch and E. Léger. The authors were able some time ago to announce that the sulphate of cinchonine being heated to 120° C. for forty-eight hours with a mixture in equal parts of sulphuric acid and water, the alkaloid changes to diverse bases, of which they have isolated the six most abundant. Here they explain the process by which they have succeeded in separating the alkalies. —On the presence of diaphragms in the aëriferous ducts of roots, by M. C. Sauvageau. The transverse diaphragms intersecting the aëriferous ducts of vascular plants have hitherto been supposed to be confined to the middle region of the bark of their various members. But the author has now determined their presence also in the root of at least one such aquatic plant, the Hydrocharis morsus-ranæ.

BERLIN.

Physiological Society, December 16, 1887 .- Prof. du Bois Reymond, President, in the chair.-Herr Meyer, from Hamburg, discussed the nature of ventriloquism, and combated the opinion, so widely spread among physiologists, that it consists in speaking while inspiring, and without the cavity of the mouth acting in any way as a resonator; on the contrary, ventriloquists speak while expiring, and do move their mouths. An extended series of laryngoscopic observations on the speaker, who has practised ventriloquism for many years, has shown that in ventriloquizing the vocal opening of the larynx is shortened as it is when producing the falsetto, and that the soft palate is pressed back and that the uvula becomes invisible. Everybody who naturally possesses a high voice can easily learn to ventriloquize. One most important factor in the deception of the listeners is the contrast between the loud, full and metallic tone in which the question is asked and the answer which immediately follows in a high and gentle falsetto. Sibilants and the high I should be as far as possible avoided. The speaker then gave a series of ex-Sibilants and the high I should be as tremely successful examples of ventriloquism, which did not presuppose any particular training, and showed that it is never accompanied by any special action of the abdominal muscles. Prof. Gad has made some experiments on Herr Meyer, and by graphically recording the variations in pressure of the air, has shown that the curve obtained when a certain sentence is spoken in the ordinary way is in all respects identical with the one which is described when the same sentence is spoken ventri-

loquially. In the latter case the volume of air expired was considerably less than during normal speech ; in one particular case it amounted to only 900 c.c., whereas during normal speech the volume expired was 1300 c.c. Dr. Benda expressed his idea that when ventriloquizing the Eustachian tubes are open and the cavity of the tympanum, together with the tympanic membrane, are set into simultaneous vibration. He had not been able to detect any resonance of the tympanic membrane in Herr Meyer ; but he believes that this explanation of the curiously veiled tones emitted is not thereby invalidated, since they closely resemble the tones produced by speaking while yawning, in which case the Eustachian tubes are certainly open and the tympanic cavity acts as a resonator.-Dr. Benda gave a further account of his re-searches on the development of spermatozoa, and referred to several works which have been recently published and do not agree with the results obtained by himself. For his own part he could only confirm his earlier opinions by his later researches. In Marsupials he finds some resemblance to that which holds good in Sauropsida. In general it may be said that the very varying relationships observed in Mammalia between the parentcell and the spermatozoa-cells which are connected with this may be looked at from one common point of view ; it is only necessary to adopt for animals the differentiation of the cells of pollen-grains, observed by botanists, into vegetative or nutritive, and into generative, from which the spermatozoa then arise. These vegetative and generative cells can be made out both in the functioning and not yet active testes of embryos, the cells having extremely varying relations each to the other.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

A Course of Elementary Instruction in Practical Biology : T. H. Huxley and H. N. Martin ; Revised Edi ion, extended and edited by Profs. Howes and Scott (Macmillan) — Early Christian Art in Ireland : Margaret Stokes (Chapman and Hall).—Diseases of the Dog : J. H. Steel (Longmans).— Papers of Fleeming Jenkin, 2 vols. (Longmans).—Practical Guide to Photographic and Photo-mechanical Printing : W. K. Burton (Marion).—United States Commission of Fish and Fisheries, Part 13, Report of the Commissioner for 1885 (Washington).—Mechanics and Experimental Science.— Mechanics : E. Aveling (Longmans).—Astronomy for Amateurs ; J. A. W. Oliver (Longmans).—Modern Theories of Chemistry : Dr. L. Meyer. translated by Profs. Bedson and Williams (Longmans).—Calendar of the University College of Wales, Aberystwith, 1887–88 (Cornish, Manchester) — The Caildren : How to Study Them : Dr. F. Watner (Hodgson).

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