

kathode rays, and canal rays associated with double kathodes (as devised by Goldstein), and pairs of simple kathodes. The conclusions of Goldstein and Kunz with respect to the form of beams of canal rays are controverted. Remarkably well-defined beams of kathode rays were obtained with some arrangements. Schuster's relation between thickness of dark space and strength of current was confirmed. The records are photographic throughout.—Some fatigue effects of the kathode in a discharge tube: R. **Whiddington**. The kathode phenomena vary with time of running in such a way as to suggest that the emitted kathode rays become more homogeneous in velocity and more slowly moving. Restoration of the kathode cannot be effected by causing the absorption of hydrogen, oxygen, nitrogen, carbon dioxide, carbon monoxide, or helium, even at the temperature of liquid air. A transient recovery occurs on momentarily running the fatigued kathode as anode. Kathodes of carbon, platinum, and aluminium were tried. The kathode fall of potential shows a falling off with the time.—The influence of dilution on the colour and the absorption spectra of various permanganates: J. E. **Purvis**. Dilute solutions of the permanganates of barium, zinc, and potassium were compared in tubes of different lengths, and so that each tube contained the same amount of dissolved salt. The highly diluted solutions gradually changed from the well-known permanganate colour to reddish-brown and to yellow colours. At the same time several of the absorption bands became narrower, and others wider, until, when the colour had become quite yellow, the bands disappeared and only marked general absorption remained. These changes took place, not only when the solutions were subjected to the influence of light, but the phenomena were observed after the solutions had remained in the dark, although light appeared to accelerate the changes. The changes also occurred when the solutions were kept out of contact with the atmosphere and light. The explanation was that the MnO_4 ion broke down with the production of MnO_2 and O_2 , and the MnO_2 was dissolved in the colloidal condition.—Note on the histology of the "giant" and ordinary forms of *Primula sinensis*: R. P. **Gregory**.

GÖTTINGEN.

Royal Society of Sciences.—The *Nachrichten* (physico-mathematical section), part i. for 1909, contains the following memoirs communicated to the society:—

January 9.—The representation of unsaturated cyclic acids and carbohydrates with semi-cyclic connection: O. **Wallach**.

February 6.—*In memoriam* Hermann Minkowski. A proof that integers may be represented by a fixed number of n th powers (Waring's problem): David **Hilbert**.—Ordinary linear differential equations with singular regions and their particular functions: H. **Weyl**.—The concept of deformation-work in the theory of elastic solids: J. **Weingarten**.

February 20.—The uniformisation of algebraic curves by means of automorphous functions with imaginary substitution-groups: P. **Koebe**.

March 6.—The decomposition of matrices: J. **Wellstein**.

March 20.—Molecular free vibrations: E. **Madelung**.

DIARY OF SOCIETIES.

THURSDAY, JUNE 3.

ROYAL INSTITUTION, at 3.—A Modern Railway Problem: Steam v. Electricity: Prof. W. E. Dalby.

LINNEAN SOCIETY, at 8.—On the Alcyonaria of the *Sealark* Expedition: Prof. J. A. Thomson.—On the Cephalochorda of the *Sealark* Expedition: H. A. S. Gibson.—Report on the Porifera collected by Mr. C. Crossland in the Red Sea: R. W. Harold Row.

RÖNTGEN SOCIETY, at 8.15.—Annual General Meeting

INSTITUTE OF ACTUARIES, at 5.—Annual General Meeting.

FRIDAY, JUNE 4.

ROYAL INSTITUTION, at 9.—Researches in Radiotelegraphy: Prof. J. A. Fleming, F.R.S.

GEOLOGISTS' ASSOCIATION, at 8.—The Fossiliferous Lower Keuper Rocks of Worcestershire: L. J. Wills.

SATURDAY, JUNE 5.

ROYAL INSTITUTION, at 3.—The Vitality of Seeds and Plants: (1) A Vindication of the Vitality of Plants: Dr. F. F. Blackman, F.R.S.

TUESDAY, JUNE 8.

ROYAL INSTITUTION, at 3.—Biological Chemistry: Dr. F. Gowland Hopkins, F.R.S.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—Prehistoric Human Remains from Various Parts of England: Dr. A. Keith.

WEDNESDAY, JUNE 9.

SOCIETY OF PUBLIC ANALYSTS, at 8.—The Estimation of Iron by Permanganate in Presence of Hydrochloric Acid: G. C. Jones and John H. Jeffery.—On Jaffé's Colorimetric Method for the Estimation of Creatinine: A. C. Chapman.—The Estimation of the Alkalinity of Bleaching Powder Solutions: Dr. K. J. P. Orton and W. J. Jones.—(1) The Sabatier-Senderens Test for Distinguishing between Primary, Secondary and Tertiary Alcohols: (2) Note on a New Test for the Halogens: Dr. G. B. Neave.

THURSDAY, JUNE 10.

ROYAL SOCIETY, at 4.30.—Croonian Lecture: The Functions of the Pituitary Body: Prof. E. A. Schäfer, F.R.S.

ROYAL INSTITUTION, at 3.—A Modern Railway Problem—Steam v. Electricity: Prof. W. E. Dalby.

MATHEMATICAL SOCIETY, at 5.30.—On the Behaviour at the Poles of a Series of Legendre's Functions representing a Function with Infinite Discontinuities: F. J. W. Whipple.—An Analogue of Pascal's Theorem in Three Dimensions: W. H. Salmon.

FRIDAY, JUNE 11.

ROYAL INSTITUTION, at 9.—Problems of Helium and Radium: Sir James Dewar, F.R.S.

PHYSICAL SOCIETY, at 8.—The Arthur Wright Electrical Device for evaluating Formulæ and solving Equations: Dr. A. Russell and Arthur Wright.—The Echelon Spectroscope, its Secondary Action and the Structure of the Green Hg line: H. Stansfield.—The Proposed International Unit of Candle Power: C. C. Paterson.—Inductance and Resistance in Telephone and other Circuits: Dr. J. W. Nicholson.—Note on Terrestrial Magnetism: G. W. Walker.—On the Form of the Pulses constituting White Light: A. Eagle.

ROYAL ASTRONOMICAL SOCIETY, at 5.
MALACOLOGICAL SOCIETY, at 8.—Diagnoses of new Trochoid Shells from North Queensland: H. B. Preston.—Notes on some of the Ampullariidæ in the Paris and Geneva Museums: G. B. Sowerby.—On the Radulæ of British Helicidæ: Rev. E. W. W. Bowell.

SATURDAY, JUNE 12.

ROYAL INSTITUTION, at 3.—The Vitality of Seeds and Plants: (2) The Life and Death of Seeds: Dr. F. F. Blackman, F.R.S.

CONTENTS.

PAGE

The Evolution of the Vascular System in Ferns. By D. H. S.	391
Electrical Engineering. By Prof. Gisbert Kapp	392
Why Leaves are Green. By H. W.	393
The Foundations of Geometry. By G. B. M.	394
Valency. By J. C. P.	395
Economic Geology in British Guiana and South Africa. By J. W. G.	395
Our Book Shelf:—	
Bateson: "The Method and Scope of Genetics."— J. A. T.	396
Boulanger: "Hydraulique Générale"	396
Scott-Moncrieff: "The Chadwick Lectures, University of London, Session 1907-8"	397
Letters to the Editor:—	
The Temperature of the Upper Atmosphere.—Dr. C. Chree, F.R.S.	397
An Optical Phenomenon.—V. P.	398
The Oldest Remains of Man. (<i>Illustrated</i> .) By Dr. William Wright	398
A Great Endowment and its Influence. By Prof. John Edgar	399
Germany and the Patents and Designs Act, 1907	401
Dr. von Neumayer, For Mem.R.S. By Hy. Harries	402
T. Mellard Reade. By H. B. W.	404
Notes	404
Our Astronomical Column:—	
Astronomical Occurrences in June	409
The Dispersion of Light in Interstellar Space	409
A Remarkable Transit of Jupiter's Third Satellite	409
The Spectrum of Magnesium in Hydrogen	410
The Perturbations of Brooks's Comet (1889 V) by Jupiter in 1886	410
Recent Observation of Daniel's Comet, 1907 <i>d</i>	410
The Variable Star 6.1909 Ursæ Majoris	410
Polar Magnetic Storms. By G. W. W.	410
Rock-Engravings in South Africa. (<i>Illustrated</i> .)	411
Centenary of the Physico-Medical Society of Erlangen	411
The International Congress of Applied Chemistry	412
Education and Research in Applied Chemistry. By Prof. Raphael Meldola, F.R.S.	413
The Campaign against Malaria. By Prof. Ronald Ross, F.R.S.	415
University and Educational Intelligence	418
Societies and Academies	419
Diary of Societies	420