

chemical as well as physical characters there is an unmistakable similarity between the two products. Thus (1) slaked lime, which, of course, accompanies carbide pellets, can be detected in some of the cavities on surfaces of the pulsator pellets. (2) Variations in hardness, form, colour, fracture, size of pellets, and peculiar markings are faithfully reproduced. (3) In either case the lumps and pellets vary in composition from iron carbide, attacked by dilute acids, to iron silico-carbide, which is attacked by hydrofluoric acid, but not by hydrochloric and sulphuric acids. (4) The pellets from either source give off an odour of acetylene when crushed. (5) The pulsator pellets, as well as ordinary carbide pellets, do not contain, so far as can be found, notable quantities of titanium. In an iron mineral derived from the ilmenite of "blue ground," by reduction at a high temperature, one should certainly expect to find titanium.—**J. C. Beattie**: Further magnetic observations in South Africa during the years 1910 and 1911. The communication contains the reduced results of observations in various parts of South Africa during 1910 and 1911 for determining the secular variation of the magnetic elements. It also contains results of additional observations in the West Transvaal and the east of Cape Province, with a discussion of the magnetic states of these regions.—**W. A. Douglas Rudge**: Action of radium salts on glass. An account of experiments carried on during the past three years in order to study the prolonged action of radium salts upon glass. Small quantities of radium were sealed up in thick-walled tubes, and the extent to which the coloration extended determined by cutting up sections of the tube, polishing the ends, and examining with a microscope. The tint developed depended upon the nature of the glass employed, and the depth of penetration depended upon the structure of the glass. Many kinds of glass show a "zonal" structure, and an abrupt change in the depth of coloration appears at the junction of successive zones. The width of the zones were measured with a micrometer, the first and darkest being 0.27 mm.; the others extended right up to the external walls of the tube, a distance of 2.48 mm. from the bore. If the coloration is due to X particles alone, the range must be much greater than would be deduced from the experiments of Rutherford and Joly. There is evidently some obstacle met with to the free passage of the rays at each zonal layer, as the coloration shows. The action of even a very impure radium salt is comparatively rapid; a few milligrams of a salt, containing about one-thousandth of its weight of radium, causes a very definite coloration at the end of twenty days, the first zone being then clearly defined. The coloration must be due to B and Y, as well as X, rays and emanation.—**J. Burt-Davy**: A new species of Mesembryanthemum from the Transvaal, and notes on the genus *Ficus*.

NEW SOUTH WALES.

Linnean Society, September 27.—**Mr. W. W. Froggatt**, president, in the chair.—**Archdeacon F. E. Haviard**: Notes on the indigenous plants of the Cobar district. The Cobar district may be said to comprise the country within a 50-mile radius of the town of Cobar, embracing an area of about 6000 square miles. It is flat, with occasional hills rising abruptly. The town of Cobar is 805 feet above sea-level, and the distance from the coast about 420 miles. The district is droughty, with prevailing high temperatures and a dry atmosphere, the average annual rainfall being about 14 inches. The flora is a typical inland, dry-country flora, the general appearance of the vegetation being that of brushwood, few trees of any kind attaining any considerable dimensions. The plants met with represent 161 genera and 284 species of Dicotyledons, 30 genera and 47 species of Monocotyledons, and 5 genera and 6 species of Acotyledons.—**R. H. Cambage**: Notes on the native flora of New South Wales. Part viii. Camden to Burrigorang and Mount Werong. One of the features brought out is the marked influence of climate upon plant distribution, for, as the mountain is ascended, the vegetation is found to correspond more nearly with that of Tasmania, where a similar climate prevails. Between Camden and Burrigorang, at altitudes ranging up to 1800 feet, 30 per cent. of the species are Tasmanian; but between Colong and Mount Werong, at altitudes varying from 2000 to 4000 feet above sea-level, about 48 per cent.

of the plants seem to belong to species which occur in Tasmania. Reference is made to the occurrence of the narrow-leaved ironbark (*Eucalyptus crebra*) around Colong at altitudes up to 2500 feet, which is unusual in latitudes south of Sydney; its presence may generally be regarded as an indication that the rock producing the soil upon which these trees grow contains upwards of 60 per cent. silica. Although it will thrive on rather poor siliceous soils, it is absent from excellent basaltic soil a few yards away, but which contains less than 45 per cent. silica; and the question is raised whether it may not be rather the physical conditions of the soil than the chemical constituents which regulate the distribution of this tree.—**R. J. Tillyard**: The genus *Diphlebia* (Neuroptera: Odonata), with descriptions of new species and life-histories. The genus *Diphlebia* is one of three closely allied genera, grouped by de Selys to form the sixth legion (Amphipteryx) in his classification of the subfamily Calopteryginae—*Devadetta* (= *Tetraneura* of Selys) from the Malay Peninsula, Siam, and Borneo, *Amphipteryx* from Colombia, and *Diphlebia* from Australia, represented, hitherto, by two species. Two additional species of the last of these are described as new, one from Kuranda, North Queensland (Dodd), and the other from rocky creeks in the Nandewar Ranges, New South Wales. The life-history of the latter has been worked out. In the Anisoptera, the characters of the larval gizzard determine the separation of the main groups. The same test should be applied to the unsatisfactory classification of the Zygoptera.

BOOKS RECEIVED.

Chemistry Note-book. By E. J. Sumner. Pp. 92. (Burnley: Cooper Printing Co., Ltd.) 2s.

Photograms of the Year, 1911-12. Typical Photographic Pictures Reproduced and Criticised. Edited by H. S. Ward. Pp. 154. (London: G. Routledge and Sons, Ltd.) 2s. 6d. net.

The Rainfall of Jamaica from about 1870 to end of 1909. By M. Hall. Pp. 27+14 maps. (Jamaica.)

Upon the Inheritance of Acquired Characters. A Hypothesis of Heredity, Development, and Assimilation. By E. Rignano. Authorised English translation by Prof. B. C. H. Harvey. With an Appendix upon the Mnemonic Origin and Nature of the Affective or Natural Tendencies. Pp. iv+413. (Chicago: Open Court Publishing Co.) 12s. 6d. net.

The Calorific Power of Gas. A Treatise on Calorific Standards and Calorimetry. By J. H. Coste. Pp. xvi+310. (London: C. Griffin and Co., Ltd.) 6s. net.

Junior Mathematics: being a Course of Geometry and Algebra for Beginners. By D. B. Mair. Pp. viii+200. (Oxford: Clarendon Press.) 2s.

Ministry of Education, Egypt. Records of the School of Medicine. Vol. iv. Part ii. By Dr. A. Looss. Pp. viii+163-613+plates xi-xix. (Cairo: National Printing Department.)

The Stars from Year to Year; with Charts for every Month. By H. P. Hawkins. Fifth edition. Pp. 23. (Bedford: Beds. Times Publishing Company, Ltd.) 1s. net.

The Star Almanac for 1912; with Star Charts of the Seasons, the North America Nebula, Solar Eclipse, &c. By H. P. Hawkins. (Bedford: Beds. Times Publishing Company, Ltd.) 6d. net.

The Star Calendar for 1912, with Revolving Chart. By H. P. Hawkins. (Bedford: Beds. Times Publishing Company, Ltd.) 1s. net.

The Evidence for the Supernatural. A Critical Study made with "Uncommon Sense." By Dr. I. L. Tuckett. Pp. vi+399. (London: Kegan Paul and Co., Ltd.) 7s. 6d. net.

Forecasting Weather. By Dr. W. N. Shaw, F.R.S. Pp. xxvii+380. (London: Constable and Co., Ltd.) 12s. 6d. net.

Boiler Draught. By H. K. Pratt. Pp. vi+138. (London: Constable and Co., Ltd.) 4s. net.

The Colloidal and Crystalloidal State of Matter. By Prof. P. Rohland. Translated by W. J. Britland and H. E. Potts. Pp. 54. (London: Constable and Co., Ltd.) 4s. net.

Applied Biology: an Elementary Text-book and Laboratory Guide. By Prof. M. A. and A. N. Bigelow. Pp. xi+583. (London: Macmillan and Co., Ltd.) 6s. net.

Revolving Vectors with Special Application to Alternating Current Phenomena. By Prof. G. W. Patterson. Pp. vi+89. (London: Macmillan and Co., Ltd.) 4s. 6d. net.

Stability in Aviation. An Introduction to Dynamical Stability as applied to the Motions of Aeroplanes. By Prof. G. H. Bryan, F.R.S. Pp. x+192. (London: Macmillan and Co., Ltd.) 5s. net.

The Making of Northern Nigeria. By Captain C. W. J. Orr. Pp. x+306. (London: Macmillan and Co., Ltd.) 8s. 6d. net.

The Land of Uz. By Abdullah Mansûr (G. Wyman Bury). Pp. xxviii+354. (London: Macmillan and Co., Ltd.) 8s. 6d. net.

Fourth Report of the Wellcome Tropical Research Laboratories at the Gordon Memorial College, Khartoum. Vol. A—Medical. Pp. 494+xxiii plates+118 figures. (London: Baillière, Tindall and Cox.) 21s. net.

The Recent and Fossil Foraminifera of the Shore-sands at Selsey Bill, Sussex. By E. Heron-Allen and A. Earland. (Printed by W. Clowes and Sons, Ltd., London.)

The Ontario High School Physics. By Dr. F. W. Merchant and Prof. C. A. Chant. Pp. viii+504. (Toronto: Copp, Clark Company, Ltd.) 90 cents.

The Ontario High School Laboratory Manual in Physics. By Dr. F. W. Merchant and Prof. C. A. Chant. Pp. viii+128. (Toronto: Copp, Clark Company, Ltd.) 35 cents.

Ministère de l'Agriculture. Direction de l'Hydraulique et des Améliorations Agricoles. Service des Grandes Forces Hydrauliques (Région des Alpes). Etudes Glaciologiques. Tome ii. Savoie—Programme pour l'Étude d'un Grand Glacier. Pp. vii+140.

The Indian Forest Memoirs. Forest Botany Series. Vol. i. Part i.—On some Indian Forest Grasses and their Ecology. By R. S. Hole. Pp. iv+126+xl plates. (Calcutta: Superintendent of Government Printing, India.) 8s. 6d.

The Transactions of the Linnean Society of London. Second series—Zoology. Vol. xi. Part vi.—On the Life-history of *Chermes himalayensis*, Steb., on the Spruce (*Picea Morinda*) and Silver Fir (*Abies Webbiana*). By E. P. Stebbing. Pp. 99-124+plates 20-23. (London: Linnean Society.)

DIARY OF SOCIETIES.

FRIDAY, DECEMBER 1.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Brake-lining Coefficients of Friction: J. and W. Legg.
GEOLOGISTS' ASSOCIATION, at 8.—(1) Note on a Maxilla of Triconodon from the Middle Purbeck Beds of Swanage; (2) On Prehistoric Paintings and Drawings in the Caverns of Northern Spain: Dr. A. Smith Woodward, F.R.S.

MONDAY, DECEMBER 4.

SOCKET OF ENGINEERS, at 7.30.—The Design of Tall Chimneys: H. Adams.
SOCIETY OF CHEMICAL INDUSTRY, at 8.—Physical Properties of Clays: W. C. Hancock.—The Value of the Non-tannins in the Formation of Leather: Dr. J. Gordon Parker and R. J. Blockey.—The Estimation of Carbon Monoxide: L. A. Levy.—The Composition of Bassia Fats: Russell G. Pelly.

ARISTOTELIAN SOCIETY, at 8.—Animism and the Doctrine of Energy: Dr. T. P. Nunn.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Geography and Economic Development of British Central Africa: Sir Alfred Sharpe, K.C.M.G., C.B.

ROYAL SOCIETY OF ARTS, at 8.—The Carbonisation of Coal: Prof. Vivian B. Lewis (Lecture II.).

TUESDAY, DECEMBER 5.

RÖNTGEN SOCIETY, at 8.15.—The Energy of the X-Ray: Prof. W. H. Bragg, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Further Discussion: Electric Lighting of Railway Trains: the Brake-Vehicle Method: R. T. Smith.

WEDNESDAY, DECEMBER 6.

SOCIETY OF PUBLIC ANALYSTS, at 8.—The Estimation of Small Quantities of Essential Oil in Spices, etc. (Part II.): J. A. Brown.—The Determination of Furfural by Means of Fehling's Solution: Lewis Eynon and J. H. Lane.—The Examination of Petroleum Mixtures: J. H. Coste, E. T. Shelbourn, and E. R. Andrews.—Note on Ground Almonds: G. C. Jones and R. F. Easton.—A Method for Determining the Amount of Insoluble Particles in Raw Rubber: C. Beadle and Dr. H. P. Stevens.—Note on the Determination of Small Quantities of Methyl Alcohol: C. Simmons.—Note on Oil of Male Fern: Ernest J. Parry.—(1) The Composition of Australian (Victoria) Milk; (2) The Composition of Sweetened Condensed Milk; (3) The Aldehyde Figure of Butter: E. Holl Miller.

FARADAY SOCIETY, at 8.—A Redetermination of the Density and Coefficient of Linear Expansion of Aluminium: Dr. F. J. Brisl e.—The Solution Volumes of Nitric Acid: V. H. Veley, F.R.S.—The Influence of the Physical Condition of Metals on Cathodic Over-voltage: Dr. J. N. Pring and J. R. Curzon.—Notes on Thermostats: Prof. Hugh Marshall, F.R.S.—Notes on Two Thermo Regulators: W. R. Bousfield, K.C.—Notes on Thermostats and Devices used in Connection with Thermostats: Dr. A. C. Cumming.

ENTOMOLOGICAL SOCIETY, at 8.
ROYAL SOCIETY OF ARTS, at 8.—British Guiana and its Founder, Storm van 's Gravesande: J. A. J. de Villiers.

GEOLOGICAL SOCIETY, at 8.—The Faulted Inlier of Carboniferous Limestone at Upper Vobster (Somerset): Dr. T. F. Sibly.—Geology of a Part of Costa Rica: James Romanes.

THURSDAY, DECEMBER 7.

ROYAL SOCIETY, at 4.30.—Probable Papers: Lapworth: a Typical Brittlestar of the Silurian Age, with Suggestions for a New Classification of the Ophiuroidea: Miss I. B. Sollas and Prof. W. J. Sollas, F.R.S.—The Physiological Influence of Ozone: Dr. Leonard Hill, F.R.S., and M. Flack.—On the Factors Concerned in Agglutination: H. R. Dean.—The Action of Dissolved Substances upon the Auto-fermentation of Yeast: Dr. A. Harden, F.R.S., and S. G. Paine.—Further Experiments upon the Blood Volume of Mammals and its Relation to the Surface Area of the Body: Prof. Georges Dreyer and W. Ray.—The Origin and Destiny of Cholesterol in the Animal Organism. Part viii. On the Cholesterol Content of the Liver of Rabbits under Various Diets and During Inanition: G. W. Ellis and J. A. Gardner.

LINNEAN SOCIETY, at 8.—The Internodes of Calamites: Prof. Percy Groom.—On Some Mosses of New Zealand: H. N. Dixon.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Notes on National and International Standards for Electrical Machinery: Dr. R. Pohl.

CONTENTS.

	PAGE
The Scientific Study of Mammals. By A. S. W.	135
Geographical Distribution of Ferns. By A. W. H.	136
Ophthalmic Therapeutics	137
Pharmacognosy in the United States. By Prof. Henry G. Greenish	137
The Chemistry of Bleaching	138
Systematic Psychology. By W. B.	139
Our Book Shelf	139
Letters to the Editor:—	
The Weather of 1911.—Dr. W. N. Shaw, F.R.S.	141
The Inheritance of Mental Characters.—Dr. G. Archdall Reid	142
Amedeo Avogadro.—Eng.-Lieut. Edgar C. Smith, R.N.	143
Characteristic Röntgen Radiations.—R. Whiddington	143
A Suggested Reform in Palaeobotany.—Dr. Marie C. Stopes	143
The Unit of Momentum.—Prof. F. R. Barrell; Prof. John Perry, F.R.S.	144
Fish and Drought.—J. Y. Buchanan, F.R.S.	144
The Interaction between Passing Ships. (With Diagrams.)	145
The Central Europe Earthquake, November 16, 1911. (With Diagram.) By Prof. John Milne, F.R.S.	146
Dust Explosions. By Prof. W. Galloway	147
The Teaching of Mathematics. By R. Y. S.	147
Tsetse-flies and Sleeping Sickness	149
The International Conference at Paris on Nautical Almanacs	149
The Solar Physics Observatory	151
Notes	151
Our Astronomical Column:—	
Astronomical Occurrences for December	155
Observations of Mars	155
Are the White Nebulae Galaxies?	155
Meteor Studies	156
Popular Observatories	156
The Greek Question at Oxford	156
Papers on Invertebrates. By R. L.	156
Lipoids and Nutrition	157
Water Resources of the United States	157
Roman Surveying	158
The Natural History of Tyneside	158
Cancer Research	158
Investigation of the Upper Atmosphere. (With Diagram.)	161
A Scientific Miscellany	162
University and Educational Intelligence	163
Societies and Academies	164
Books Received	167
Diary of Societies	168