such provision for complete knowledge of the arts and sciences can we as a nation maintain our place in the world." Each of the pamphlets appeals to the reader in the following words:—"For your own sake, your children's sake, your country's sake, do all *you* can to push through the Education Bill. Get in touch with your M.P."

THE following letter from Lord Stamfordham, the King's private secretary, has been received by Mr. Fisher, President of the Board of Education:—"It has given the King and Queen much pleasure to visit recently schools of various types, and thus gain an insight into the daily life of the rising generation at work and at play. Their Majesties are aware of the magnificent response which the educational service throughout the country has made to the demands of the present time, not only in its contribution to the fighting forces, but also in the assistance which it has rendered in many kinds of important war work. Above all, they wish to express their admiration of the self-denial and devotion of the teachers, who, it is evident, while training the mind and body of their pupils, recognise the importance of the formation of character. These visits have brought home to the King and Queen the keenness and patriotism of the youth of the country. They realise the unselfish and hearty manner in which boys and girls, inspired by the example of their teachers, have formed War Savings Associations, subscribed money for charitable purposes, and, by their handiwork, contributed to the personal needs and comforts of the troops. Their Majesties feel that the nation can be proud of its young sons and daughters, whose example during this great war augurs well for the future of our race. I am commanded to request you to convey to the school authorities and teachers the hearty congratulations of the King and Queen upon the admirable manner in which the public service of education is being maintained, the progress of which their Majesties will ever watch with interest and sympathy."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Meteorological Society, April 17.—Sir Napier Shaw, president, in the chair.—E. G. **Bilham**: The variations of underground watel-level near a tidal river. The paper is chiefly devoted to a comparison of records from the Kew Observatory water-level recorder and the Richmond Lock tide-gauge for a period of two years beginning May, 1914. The seasonal variations, determined from lunar-monthly means, were found to be very similar, as was to be anticipated on general grounds. A better method of determining the extent to which the variations of subsoil water-level were directly controlled by the River Thames consisted in the analysis of the well records to find tidal oscillations analogous to those which were well-marked in the river. The well responds but slightly to the lunar semi-diurnal tide, but the lunar-fortnightly oscillation is well reproduced with a lag of five days and a reduction of amplitude in the ratio of 1 to 14 (approximately). After allowing for the direct action of the river, the well is found to be very sensitive to local rainfall during winter months. The effects of rainfall upon river-level and underground water-level appear to be in many respects closely similar.—J. **Fairgrieve**: Suggestions as to the conditions precedent to the occurrence of summer thunderstorms, with special reference to that of June 14, 1914. The paper deals particularly with the thunderstorm of June 14, 1914. The meteorological phenomena accompanying the rainfall are put on record. The cloud distribution, the barometric pressure, the wind movements, and the temperature are specially dealt with. From an examination of the data it is evident that the clouds and the rainfields lie in parallel belts, and that the former appear some hours before the rain begins to fall. It is suggested that this belting of wind and rain may be due to rippling on a large scale, the rippling being brought about by the interaction of two currents of different temperatures. If the conditions are unstable, and especially if relief also induces disturbance, thunderstorms will develop along lines of rippling, and will drift with the wind Thunderstorms have apparently three movements, a development along a belt, a sideways movement in the direction of the prevailing wind, *i.e.* to leeward, and a spread to windward. The first may be due to rippling; the second is a drift; the third may be explained if it is granted that a local ridge of high pressure develops along the axis of the thunderstorm. The thunderstorm then breaks up into two belts, of which the leeward soon dies out owing to the lack of a supply of rising air.

PARIS.

Academy of Sciences, April 8.—M. Paul Painlevé in the chair.—Col. **Vallier**: Obituary notice of Gen. Zaboudski. Gen. Zaboudski, correspondant in the section of mechanics, was assassinated in Petrograd in March, 1917, but his death has only recently come to the knowledge of the Academy.—A. **Lacroix**: Some sodium rocks, lode-like in character, of the Archipelago of Los, French Guinea. Thirteen minerals are described and complete analyses given. Even in the rocks most removed from syenites the alkaline character persists, with a predominance of soda over potash. The connection between the lodes and the surrounding syenites is also indicated.—E. **Fournier**: The causes and effects of the resistance of water to the translation of ships' hulls.—L. **Maquenne** and E. **Demoussy**: The influence of acids on germination. Care has to be taken to prevent the disturbing influence of calcium salts on the experiments, calcium derived either from the water or from the integuments of the seeds themselves. It is concluded that the mineral acids, even in extreme dilution, are poisonous and hinder germination.—E. **Ariès**: The anomalies presented by the saturated vapour pressures of certain diatomic liquids. A comparison of the formula derived by the author in previous communications with the experimental figures for oxygen and nitrogen shows marked differences; the data for nitric oxide are also not in agreement with the calculated figures. The causes of the divergence are discussed.—B. de **Fontviolant**: Strains developed in bridges with straight girders, with double lines, when one line only is loaded.—D. **Eydoux**: Conduits closed at both ends. Accumulators and buffer cylinders.—E. **Baticle**: The determination of the most advantageous dimensions of the principal elements of a hydraulic installation.—A. **Mailhe** and F. de **Godon**: A new preparation of the methyltoluidines by catalysis. The method described in a preceding communication of preparing monomethylaniline and dimethylaniline by passing a mixture of the vapours of methyl alcohol and aniline over alumina heated to 350° to 400° C. is now shown to be applicable to the preparation of the methyltoluidines.—E. **Belot** and C. **Gorceix**; The experimental reproduction of the formation of great mountain chains.—E. **Hesse**: *Caulleryella anophelis*, a schizogregarine parasite of *Anopheles bifurcatus*.—R. **Combes**: The equine paratyphoid bacillus.—A. **Vernes**: The precipitation of an organic colloid by human serum, normal or syphilitic. It is shown to be possible so to regulate the state of a colloidal suspension that it can be flocculated by syphilitic serum, and not flocculated by normal serum.—R. **Dubois**: The synthesis of luci-

ferine. Luciferine can be synthesised by the action of coluciferase upon taurine.

April 15.—M. L. Guignard in the chair.—G. **Humbert**: The representations of an integer by certain indefinite quadratic forms,—C. **Richet**, P. **Brodin**, and Fr. **Saint-Girons**: The density of the blood after great hæmorrhage. With loss of blood there is a progressive lowering of the density, and the determination of the density of the blood gives a better measure of the loss through a wound than any other method available.—G. A. **Boulenger**: Considerations on the affinities and geographical dispersion of the Lacertidæ.—G. **Julia**: Rational substitutions.—R. **Garnier**: The irregular singularities of linear equations.—M. **Valiron**: The maximum of the modulus of entire functions.—M. de **Pulligny**: Some new remarks on the approximate quadrature of the circle.—E. **Hernandez-Pacheco**: The Cambrian of the Sierra de Cordoba, Spain.—L. **Gentil**, M. **Lugeon**, and L. **Joleaud**: The age of the pre-Riffian layers and the crushing of the South Riffian Strait, Morocco.—H. **Perrotin**: The nocturnal cooling of the lower layers of the atmosphere.—J. **Legendre**: The biology of the Madagascan perch.—M. **Heitz-Boyer**: An attempt at the mechanical reduction of fractures.

BOOKS RECEIVED.

Memoirs of the Geological Survey. Special Reports on the Mineral Resources of Great Britain. Vol. iii., Gypsum and Anhydrite, by Dr. R. L. Sherlock and B. Smith; and Celestine and Strontianite, by Dr. R. L. Sherlock. Second edition. Pp. iv+64. (London: H.M.S.O.) 2*s*. net.

Story Lives of Great Scientists. By F. W. Rowbotham. Pp. 266. (London: Wells Gardner and Co., Ltd.) 3*s*. 6*d*.

A Flora of Epsom and its Neighbourhood. By the Rev. T. N. Hart Smith-Pearse. Pp. 107. (Epsom: L. W. Andrews and Son.) 3*s*. 6*d*. net.

The Manufacture of Intermediate Products for Dyes. By Dr. J. C. Cain. Pp. xi+263. (London: Macmillan and Co., Ltd.) 10*s*. net.

A Check List of North American Amphibians and Reptiles. By L. Skejneger and T. Barbour. Pp. 125. (Cambridge, Mass.: Harvard University Press.) 10*s*. 6*d*. net.

British Museum (Natural History). Report on Cetacea Stranded on the British Coasts during 1917. By Dr. S. F. Harmer. Pp. 5 to 21. (London: British Museum (Natural History).) 2*s*. 6*d*.

British Museum (Natural History). British Antarctic (*Terra Nova*) Expedition, 1910. Natural History Report. Zoology. Vol. iv., No. 2, Cephalodiscus. By Dr. W. G. Ridewood. Pp. 11–82. (London: British Museum (Natural History).) 12*s*.

DIARY OF SOCIETIES.

THURSDAY, MAY 2.

ROYAL SOCIETY, at 4.—Election of Fellows.—At 4.30.—Nerve-End Cells in the Dental Pulp: Dr. J. H. Mummery.—The Nature of Growths in Colloidal Silica Solutions: H. Onslow.

ROYAL SOCIETY OF ARTS, at 4.30.—The Freedom of the Seas: Gerard Fiennes.

LINNEAN SOCIETY, at 5.—A New Fresh-water Shrimp (*Caridina*) from Fiji: G. M. Thomson.—(1) *Bennettites scottii*, sp. nov., a European Petrifaction with Foliage; (2) A Survey of the Biological Aspect of the Constitution of Coal: Dr. Marie Stopes.

FRIDAY, MAY 3.

ROYAL INSTITUTION, at 5.30.—The Spinning Top in Harness: Sir G. Greenhill.

INSTITUTION OF MECHANICAL ENGINEERS, at 6.—*Discussion*: Employment of Women in Munition Factories. Opener, Miss O. E. Monkhouse.

SATURDAY, MAY 4.

ROYAL INSTITUTION, at 3.—Modern Investigation of the Sun's Surface: Prof. H. F. Newall.

MONDAY, MAY 6.

ARISTOTELIAN SOCIETY, at 8.—Practical Dualism: Miss E. E. Constance Jones.

SOCIETY OF ENGINEERS, at 5.30.—Modern Shipbuilding and Economy in Material: J. W. Isherwood.

SOCIETY OF CHEMICAL INDUSTRY, at 7.30.—The Interaction of Aluminium and (*a*) the Alcohols, (*b*) the Higher Fatty Acids, (*c*) Phenol, Cresol, and Naphthol: Dr. R. Seligman and P. Williams.—The Principles and Applications of Hot-Wire Anemometry: J. S. G. Thomas.

TUESDAY, MAY 7.

ROYAL INSTITUTION, at 3.—Craniologists: Prof. A. Keith.

ZOOLOGICAL SOCIETY, at 5.30.—The Arenaceous Foraminifera of the Genus Thurammina: E. Heron-Allen.—Comparison between the Lower Jaws of the Cynodont Reptiles Gomphognathus and Cynognathus: Dr. Branislav Petronievics.—A New Genus of Extinct Muscardine Rodent from the Balearic Islands: Miss Dorothea M. A. Bate.

FARADAY SOCIETY, at 5.30.—*Discussion*: The Co-ordination of Scientific Publication. Opener, Sir Robert Hadfield, Bart.

RÖNTGEN SOCIETY, at 7.45.

WEDNESDAY, MAY 8.

ROYAL SOCIETY OF ARTS, at 4.30.—The Rubber Planting Industry: Prof. John B. Farmer.

BRITISH ASSOCIATION GEOPHYSICAL COMMITTEE (Royal Astronomical Society), at 5.—*Discussion*: The Movements of the Earth's Pole. Opener, Sir F. W. Dyson.

THURSDAY, MAY 9.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Contribution to the Theory of Attraction when the Force varies as any Power of the Distance: Major P. A. MacMahon and H. B. C. Darling.—Electromagnetic Integrals: Sir George Greenhill.—Intensity Relations in the Spectrum of Helium: Dr. T. R. Merton and Prof. J. W. Nicholson.—The Outline of a Theory of Magnetic Storms: Dr. S. Chapman.

ROYAL INSTITUTION, at 3.—The Folk Lore of Bells: Sir J. G. Frazer.

ROYAL SOCIETY OF ARTS, at 4.30.—The Freedom of the Sea: Sir F. T. Piggott.

INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—*Discussion*: A British Electrical Proving House. Opener, C. Turnbull.

OPTICAL SOCIETY (Imperial College of Science and Technology), at 7.—Note on Spherical Aberration: T. Y. Baker and Major L. N. G. Filon.

FRIDAY, MAY 10.

ROYAL INSTITUTION, at 5.30.—Human Nutrition: Prof. F. Gowland Hopkins.

ROYAL ASTRONOMICAL SOCIETY, at 5.

PHYSICAL SOCIETY, at 5.—The Times of Sudden Commencement of Magnetic Storms: S. Chapman.—The Entropy of a Metal: H. S. Allen.—Tracing Rays through an Optical System: T. Smith.

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