

We have received from the Cambridge University Extension authorities the detailed programme of their summer meeting. Courses of study extending over a month (from July 29 to August 26 inclusive) have been arranged, intended primarily for those connected in some way with the University Extension Movement, though all members of the teaching profession and other students are also admitted. Though the full course extends over a month it has been arranged that those who can only spare a fortnight shall have a fairly complete course of work to go through. The subjects on which instruction is offered are extremely varied, including history, literature, and language, art, economics, and natural science. On the scientific side several courses of laboratory work are provided and in addition there are to be a set of lectures illustrating, from the history of several sciences, the progress and methods of natural science. The services of Sir Robert Ball, Sir Henry Roscoe, and a number of other well-known lecturers have been secured. Many intending visitors will be glad also to see that the authorities have not forgotten that August is a time for recreation as well as study and have made special arrangements for boating, for admission to college gardens, as well as for several excursions to places of historic, artistic, or scientific interest. Three colleges have agreed to board students at extremely moderate rates, and there is an abundance of lodgings. The total expense of the month for a student living economically need not exceed £6 or £7. There are probably not many other ways in which such a pleasant and profitable holiday can be spent for so small a sum.

THE following elections to natural science scholarships at Oxford have been announced:—Mr. H. C. H. Carpenter, of Eastbourne College, to a Natural Science Postmastership at Merton College. Mr. T. J. Garstang, of Manchester Grammar School, to a Natural Science Scholarship at Corpus Christi College. Mr. Richard Warren, of the Charterhouse, to an Open Natural Science Scholarship at New College. In each case the value gained is £80 per annum.

SUMMER courses seem to be the order of the day. The Marine Biological Laboratory at Woods Holl, Massachusetts, was opened on June 1, and will remain open until August 30. The Laboratory has aquaria supplied with running sea-water, boats, a steam launch, collecting apparatus, and dredges. There are thirty-three private laboratories for investigators, and five general laboratories. Short courses has also been arranged in zoology and botany, the laboratory work in each case being accompanied by lectures. Every facility is given for the obtaining of general knowledge, while those who are prepared to begin original work, under the guidance of instructors, are provided for as well as the practised investigator. This classification of workers into three grades is an excellent one and well worthy of imitation.

COL. SIR CHARLES W. WILSON, F.R.S., has been appointed Honorary Master of Engineering of the University of Dublin.

### SCIENTIFIC SERIAL.

*American Meteorological Journal*, June.—The principal articles are: Note on the relation of solar spots to terrestrial anticyclones, by A. Searle. The relation considered is not one of cause and effect, but simply an analogy recently suggested in the *Astronomische Nachrichten*, by E. von Oppolzer, whose idea is to substitute the anticyclone instead of the cyclone as is usually done, as the terrestrial term of the comparison. The author considers the comparison to be both striking and plausible, but Prof. Davis thinks it should be limited to terrestrial anticyclones during winter nights.—A new series of isanomalous temperature charts, based on Buchan's isothermal charts, by S. F. Batchelder. The author has constructed a new set of isanomalous charts, based on the observations of the *Challenger* expedition, which are said to show more plainly than those of Humboldt and Dove the departures from the average temperature of a parallel of latitude. The cold area on the west coast of South America is found to be  $10^{\circ}$  too cool, instead of  $6^{\circ}7'$ ; that on the west coast of Africa to be  $6^{\circ}$  instead of  $4^{\circ}5'$ . The excess of heat of Southern Alaska is given as  $10^{\circ}$  instead of  $6^{\circ}7'$ , and the south coast of Norway (under the influence of the Gulf Stream) is found to be  $23^{\circ}$  over the average for the latitude, instead of  $20^{\circ}3'$ , while the cold areas in the

interior of North America and Asia, given as  $11^{\circ}3'$  by Dove, are now shown to be  $14^{\circ}$  below the mean temperature of their latitude.—Proposed subjects for correlated study by State Weather Services, by W. M. Davis. The non-telegraphic records are almost entirely reduced in an arithmetical manner, suitable for the determination of climate, but not for the determination of unperiodic factors of the kind with which weather changes are concerned. The author suggests that all observers should make hourly records of the ordinary weather elements on certain days, that these observations should be charted for every hour, and afterwards consolidated on a single map for the whole country, by which means some extremely interesting illustrations of weather phenomena would be gained, and give a better knowledge of processes now imperfectly understood.—Meteorology as the physics of the atmosphere, by W. von Bezold. This concluding part deals more especially with observations made in balloons, and with thermometer exposure. The author thinks it probable that Dr. Assmann's aspirator will show that the temperatures hitherto made in balloons are affected by radiation to the extent of  $10^{\circ}$  at least. He also gives some valuable advice as to the observation of clouds, and draws especial attention to the importance of observing not only their outward appearance, but more particularly their formation and dissolution, so as to establish their classification and nomenclature upon a natural basis.

### SOCIETIES AND ACADEMIES.

#### LONDON.

Royal Society, June 8.—“The Experimental Proof that the Colours of certain Lepidopterous Larvæ are largely due to modified Plant Pigments, derived from Food.” By E. B. Poulton, F.R.S.

The object of this investigation was to afford a conclusive test as to the theory, previously submitted by the author, that some of the colours of certain Lepidopterous larvæ are made up of modified chlorophyll derived from the food-plant.

Larvæ from one batch of eggs laid by a female *Tryphæna pronuba* were divided into three lots fed (in darkness) respectively throughout their whole life upon (1) green leaves, (2) yellow etiolated leaves, and (3) white mid-ribs of cabbage. The larvæ fed upon (1) and (2) became green or brown as in nature, thus proving that etiolin, no less than chlorophyll, can form the basis of the larval ground-colour. Those fed upon (3), in which neither chlorophyll nor etiolin was accessible, were entirely unable to form the green or brown ground colour. The production of dark superficial cuticular pigment was, however, unchecked. One of the larvæ fed in this way was perfectly healthy, and had become nearly mature when it was accidentally killed. Many others died early, but resembled that last described in the inability to form a ground-colour.

The experiment seems to leave no doubt as to the validity of the conclusions previously reached. Interesting questions as to the changes passed through by the derived pigments are suggested by this inquiry.

“The Menstruation of *Semnopithecus entellus*.” By Walter Heape, Balfour Student at the University of Cambridge. Communicated by Prof. M. Foster, Sec.R.S.

“Researches on the Structure, Organisation, and Classification of the Fossil Reptilia. Part viii. On further Evidences of *Deuterosaurus* and *Rhopalodon* from the Permian Rocks of Russia.” By H. G. Seeley, F.R.S.

Royal Meteorological Society, June 21.—Dr. C. Theodore Williams, President, in the chair.—Mr. R. H. Scott, F.R.S., read a paper on fifteen years' fogs in the British Islands, 1876–1890, which was a discussion of the fog observations made at the stations which appear in the *Daily Weather Report*. From the observations it appears that there is no trace of a regular increase either in the monthly or in the annual curve. All that can be said is that taking the three lustral periods of five years each, the last of these, 1886–90, comes out markedly the worst, the successive totals being 262, 250, 322.—A paper on upper currents of air over the Arabian Sea, by Mr. W. L. Dallas, of the Indian Meteorological Office, was also read, in which it is shown that there exists a regular arrangement in the vertical succession of the upper currents, and that the Doldrum region,

and not the geographical equator, is really the dividing line between the currents of the northern and southern hemispheres.

## PARIS.

**Academy of Sciences, June 26.**—M. Loewy in the chair.—On the employment of Lagrange's equations in the theory of impact and percussions, by M. Paul Appell.—Theoretical calculation of the inferior contraction in weirs with thin walls and sheets free below, when this contraction attains its greatest values; with experimental verifications, by M. J. Boussinesq.—Formation of natural phosphates of aluminium and iron; phenomena of fossilisation, by M. Armand Gautier. Aluminium phosphate was formed in the Minerva grotto by the action of ammonium phosphate, resulting from the destruction of a bank of guano, upon a subjacent layer of hydrargilite. This action is easily reproduced experimentally. It is even possible to form a small quantity of aluminium phosphate by the prolonged action of ammonium phosphate upon kaolin. Iron phosphates are produced by the action of ammonium phosphate upon spathic iron ore. This is probably the usual origin of vivianite. It is shown that the simultaneous formation of ammonia, sulphuretted hydrogen, and other products of slow bacterial fermentation, with the action of the air dissolved in water, gives rise, in strata at the same time calcareous and ferruginous, to the simultaneous production of lime phosphates and of pyrites.—Note by M. Daubrée accompanying the presentation, in the name of its authors, of the geological map of European Russia.—Observations of the planet Charlois (1893 Z) made with the 14-inch equatorial of the Bordeaux Observatory by M. L. Picart.—On the maximum modulus which a determinant can attain, by M. Hadamard.—Experimental determination of the constant of universal attraction, and of the mass and density of the earth, by M. Alphonse Berget.—On the third principle of energetics, by M. H. Le Chatelier. The laws of the conservation of mass, of momentum, of quantity of electricity, of the centre of gravity, &c., can be embodied in a single law as follows: The individual "energy capacities" of an isolated system are constant, except that of heat (entropy) which increases in irreversible transformations. This "energy capacity," so termed by Ostwald, is made up of several factors of the type of those enumerated above.—On the employment of mercury in potential equalisers by flow, by M. G. Gouré de Villemontée.—Research on the dielectric constants of some biaxial crystals, by M. Ch. Borel. The principal constants of five rhombic and ten clinorhombic substances were determined by finding their axes of polarisation and measuring their periods of oscillation in a uniform electric field, and also measuring the attraction along each axis of polarisation. The crystals were cut in the shape of spheres. The attraction method was like that used by Boltzmann, except that his bifilar balance was replaced by a unifilar quartz fibre balance. Most of the substances examined were double sulphates. A redetermination of the constants for rhombic sulphur showed a closer agreement with Maxwell's law than Boltzmann's results.—On a new method of directly transforming alternating into direct currents, by M. Charles Pollak.—On the combinations of oxalic acid with titanate and stannic acids, by M. E. Pechard.—Researches on the chlorosulphides of arsenic and antimony, by M. L. Ouvrard.—Action of carbonic oxide upon sodammonium and potassammonium, by M. A. Joannis.—On the combinations of boron bromide with the bromides of phosphorus, by M. Tarible.—On the action of zinc and magnesium on metallic solutions and on the estimation of potash, by MM. A. Villiers and Fr. Borg.—Observations on a marine miocene raudannite of the Limagne d'Auvergne, by M. Paul Gautier.—The duration of excitability of the nerves and muscles after death is much greater than is generally believed, by M. A. d'Arsonval. This may be shown by means of the myophone, a kind of microphone arranged so as to indicate small muscular contractions. The instrument gives indications of muscular excitability in a rabbit even ten hours after death.—Remarks on M. d'Arsonval's paper, by M. Brown-Séguard. The fact that a muscle under the influence of complete cadaveric rigidity, remaining perfectly inert under the influence of the strongest impulses provoking contraction, is capable of rhythmic motor actions when its nerve is excited, is one of the most interesting discoveries in the physiology of nerves and muscles.—Sketch of the principal anatomo-pathological types of adult chronic gastritis, by M. Georges Hayem.—Observations on ice, made during the cruise of *La Manche*, by M. G. Pouchet.

## BOOKS, PAMPHLETS, and SERIALS RECEIVED.

**BOOKS.**—Elements of Psychology: Prof. J. M. Baldwin (Macmillan).—Everybody's Guide to Music: J. Booth (Saxon).—A Handbook on the Steam-Engine: H. Haeder, translated by H. H. P. Powles (C. Lockwood).—Murray's Handbook—Switzerland, Savoy, Piedmont, 18th edition (Murray).—University Correspondence College Calendar, 1892-93 (London).—Worked Examples in Co-ordinate Geometry (Clive).—A Biographical Index of British and Irish Botanists: J. Britten and G. S. Boulger (West, Newman).—Foundations of the Atomic Theory (Alembic Club Reprints, No. 2): Dalton, Wollaston, and Thomson (Edinburgh, Clay).—Im Reiche des Lichtes, Sonnen, Zodiakallichte, Kometen: H. Gruson (Asher).—Hourly Meteorological Observations made at the Madras Observatory, January, 1856, to February, 1861 (Madras).

**PAMPHLETS.**—Sir J. B. Lawes and the Rothamsted Experiments: C. M. Aikman (Glasgow).—U.S. Department of Agriculture: Reports of Observations and Experiments in the Practical Work of the Division (Washington).—Traces of Glacial Man in Ohio: W. H. Holmes (Chicago).—Are there Traces of Man in the Trenton Gravels: W. H. Holmes (Chicago).—Distribution of Stone Implements in the Tide-Water Country: W. H. Holmes (Chicago).—Report and Proceedings of the Ealing Microscopical and Natural History Society for 1892 (Ealing).—Yorkshire Carboniferous Flora: R. Kidston (Leeds).

**SERIALS.**—Proceedings of the Royal Society of Victoria, Vol. v. new series (Williams and Norgate).—Journal of the Royal Microscopical Society, June (Williams and Norgate).—Journal of the Asiatic Society of Bengal, Vol. lxi. Part 2, No. 3, 1892 (Calcutta).—Journal of the Royal Agricultural Society of England, third series, Vol. 4, Part 2, No. 14 (Murray).—The Botanical Gazette, June (Bloomington, Ind.).—Nyt Magazin for Naturvidenskaberne, 33te Bind, 4de og, 5te Hefte (Christiania).—L'Astronomie, July (Paris).—Himmel und Erde, July (Berlin).—Journal of Botany, July (West, Newman).

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