

lowing insects :—The gooseberry span-worm (*Eufitcheia ribearia*, Fitch), the imported currant worm (*Nematus ventricosus*, Klug.), the native currant worm (*Pristiphora grossularia*, Walsh), the strawberry worm (*Empfhytus maculatus*, Norton), Abbot's white pine worm (*Lophyrus abbotii*, Leach), and Le Conte's pine worm (*Lophyrus le contei*, Fitch). There is an account of the progress of the Colorado beetle, the army worm, the wheat-head army worm, and the Rocky Mountain locust.

MUSCULAR contraction, it is known, is always accompanied with electric phenomena; the difference of electric potential between two points of a muscle, undergoes a diminution, which, according to Bernstein, precedes by about $\frac{1}{100}$ of a second, the contraction of the muscle. This electric variation has been observed on various muscles, and in particular on the heart (by Du Bois Reymond and Kühne), and recently M. Marey has represented it graphically by photographing the indications of a Lippmann capillary electrometer. We learn from the *Journal de Physique*, that M. De la Roche has tried the experiment on the heart of a living man. Two points of the epidermis of the chest were connected with the poles of a capillary electrometer, by means of electrodes, formed each of a bar of amalgamated zinc, with a plug of muslin at its lower end saturated with sulphate of zinc. Held with insulating handles, the bars were applied, one with its plug opposite the point of the heart, under the left nipple, and the other to another point of the chest. The mercurial column was then seen to execute a series of very distinct periodical pulsations synchronous with the pulse; each pulsation even marked the double movement of the heart (of the auricles and ventricles). The amplitude corresponded to about $\frac{1}{1000}$ Daniell.

We have received from Perthes of Gotha a special map of Eastern Turkey, by Dr. Petermann, so full of details that for the war operations on and beyond the Danube, should the Russians succeed in crossing, we know of no better.

A RUSSIAN work, by M. Bogolubsky, on Gold and Gold Mining in Russia, is worthy of notice. It contains very interesting information upon that industry in Russia and Siberia. We observe that the area of gold mines occupies in the Russian empire about 2,100,000 square miles, and now yields yearly about 80,000 lbs. of gold, in value upwards of 3,000,000*l.* sterling. The total amount of gold produced in Russia since 1752 has been upwards of 2,500,000 lbs.

A VERY thorough and exhaustive investigation of the Alaska region may now be expected, through the agency of Mr. E. W. Nelson, a well-known naturalist, who has lately proceeded to Norton Sound, by way of Alaska, to relieve Mr. Turner. He has been provided with the necessary outfit by the Smithsonian Institution, and will probably greatly increase the amount of our knowledge of that interesting country.

We have received from Mr. Stanford "Botanical Tables for the Use of Junior Students," by Miss Arabella B. Buckley. There are two tables—one of some common terms used in describing plants, and the other a table of the chief natural orders of British plants, arranged according to Bentham and Oliver. Both tables are well arranged, and seem to us well calculated to serve the purpose for which they are intended.

M. MEGUIN has lately been making important researches on Acarians, and on that strange asexual form called Hypopes, a form which is not absolutely necessary for reproduction, but which seems to occur under certain biological conditions, for the indefinite conservation of the species. In the aerial reservoirs of birds, especially Gallinaceæ, there breeds an inoffensive species, which M. Meguin calls *Kytodites glaber*, which sends colonies even into the bronchial branches, and into the marrowless bones of the limbs in communication with the air vessels in birds. Another

harmless acarian is found in the cellular tissue of birds living and dying there, and persisting after death, surrounded by a calcareous tubercle. A third species, which lives normally between the barbs of the feathers, produces at the time of moulting, and in the skin of the birds, especially domestic and wild pigeons, a hypopial vermiform nymph. Without this precaution of nature, the species would be annihilated, by reason of the fall of the feathers in the moulting season.

THE additions to the Zoological Society's Gardens during the past week include a Lesser White-nosed Moakey (*Cercopithecus petaurista*) from West Africa, presented by Mrs. Cleaver; a Common Buzzard (*Buteo vulgaris*), European, presented by Mr. F. Buckland; a Smooth Snake (*Coronella levis*) from Hampshire, presented by Lord Lilford, F.Z.S.; three Crested Guinea Fowls (*Numida cristata*), two Vulturine Guinea Fowls (*Numida vulturina*) from East Africa, an Imperial Eagle (*Aquila imperialis*) from Turkey, deposited; four Summer Ducks (*Aix sponsa*), bred in the Gardens.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—In a Convocation held June 5, the decree authorising the expenditure of 7,000*l.* on the construction and fittings of new chemical laboratories at the University Museum, to which we referred p. 94, was introduced by Prof. H. Smith, and carried on a division by 64 against 42.

A second proposal to grant a sum of 2,400*l.* for additions to the University Observatory was carried on a division by 46 placets to 27 non-placets.

The Trustees of the Johnson Memorial Prize for the encouragement of the study of astronomy propose the following subject for an essay:—"The History of the Successive Stages of our Knowledge of Nebulae, Nebulous Stars, and Star-Clusters from the Time of Sir Wm. Herschel." The prize is a gold medal of the value of ten guineas, with what remains of the dividends of four years on 338*l.*, reduced annuities, after deducting cost for medals, and other expenses. The essays must be sent to the Registrar of the University on or before March 31, 1879, under the usual conditions.

CAMBRIDGE.—A curatorship in the Department of Zoology at the Museum of the University of Cambridge has just been established by the Senate, to which Mr. J. F. Bullar, B.A., of Trinity College, has been appointed. Mr. Bullar graduated in the first class of the Natural Sciences Tripos of 1875, and has been twice nominated by the University to study at the Zoological Station at Naples, where he is at present working.

The various special examinations for the Ordinary B.A. Degree were held on Friday and Saturday week, when the total number of candidates was 204, while at the corresponding period of 1876 the number was 190. Candidates can select one of the following subjects for this final examination, viz., Theology, Law, Modern History, Natural Sciences, Moral Sciences, Mechanism, and Applied Science. The number in each branch of study is as follows:—Theology, 95, Law, 31, Political Economy, 29; Modern History, 24; Natural Sciences, 21—viz., 13 in Chemistry, 5 in Botany, 2 in Zoology, 1 in Geology. In Mechanism and Applied Science there are four candidates.

Mr. William Napier Shaw, B.A., has been elected a fellow of Emmanuel College. He graduated as 16th Wrangler in the Mathematical Tripos of 1876, and obtained a first-class in the Natural Sciences Tripos, 1877, being distinguished in physics.

LONDON.—The Council of University College have elected Mr. G. D. Thane Professor of Anatomy for two years.

DORPAT.—The Annual Report of the Dorpat University for 1876, gives the number of students at the University as 815, of whom 86 study theology, 173 jurisprudence, 121 history and philology, 363 medicine, and 72 physics and mathematics. The number of professors is 67. The library of the University numbers 138,924 volumes.

RUGBY SCHOOL NATURAL HISTORY SOCIETY.—The Report of this Society for 1876, shows that it is in a "fairly healthy condition," to use the words of the preface. A considerable

proportion of the papers are by members of the Society, as are also several of the illustrations. The papers are on very varied subjects and all up to a creditable standard. The preface complains that so few members take an active part in the Society's proceedings, but, in this respect, the Society is no worse than others of much greater pretension. Still it would be to the advantage of the youthful members if the patrons and office-bearers made every effort to increase the number of actual workers. We regret that our space prevents us making special reference to any of the papers. The Botanical Section has issued a list of local plants, by H. W. Trott, the result of many years' observation; this last, we daresay, may be obtained by any one desiring it. The price is only 9d.

LONDON SCHOOL-BOARD DISTRICTS.—Mr. Stanford is preparing for the School-Board of London a series of maps of the various School-Board districts of the metropolis, which are likely to possess considerable interest. These maps are on the scale of six inches to a mile, show the various School-Board subdivisions, the positions of the schools which have been erected by the Board, and, in a different colour, of those which are under the Board's inspection. We have seen the sheet of the Hackney district, and no better evidence could be produced of the thoroughly good work done by the Board since its institution.

SCIENTIFIC SERIALS

Memorie della Società degli Spettroscopisti Italiani, January.—Note from Prof. Draper on photographing the spectra of Venus and a Lyrae; a 28-inch reflector and a 12-inch refractor are the instruments used, and an exposure of from ten to twenty minutes. In the photograph of the spectrum of a Lyrae bands or broad lines appear in the ultra-violet region totally different to anything in the solar spectrum.

February.—Letter on the comet Borelly, 1877, Brorsen-Bruhns, 1857, and the eclipse of the moon of February 27, 1877. The spectra of the first appears, according to him, to consist of some carbon compound.—Tables of statistics of protuberances and spots observed at Rome in the months of January and February, 1877.—List of positions on the solar limb in which the vapour of magnesium was observed from February 20, 1876, to July 4 of the same year.—In the appendix to this number appears an article explaining the construction of the several different forms of aneroid barometers.

March.—List of positions on the solar limb in which the vapour of magnesium was observed from July to November, 1876, by Prof. Tacchini, and a table for the year showing the frequency of visibility of the *b*-line and 1,474-line, from which it appears that the latter line is more frequently visible than the former. Table of positions and size of protuberances observed at Rome in 1876, by Father Secchi.—Some observations of the zodiacal light, by Prof. A. Serpieri.—Note by Prof. Tacchini on Mr. Le Verrier's researches on the intra-Mercurial planet.—Drawings of chromosphere for September and October, 1875, made at Rome and Palermo.

April.—Spots and facula observed spectroscopically and directly at Palermo in 1876. This paper consists of the daily notes of observations of the chromosphere for last year.—Table of spots and faculae observed in February and March, 1877, by Prof. Tacchini.—Drawings of the chromosphere for October, November, and December, 1875, by Secchi, Ferrari, and Tacchini, observed at Rome and Palermo.

Journal de Physique, April.—On the cause of the motion in the radiometer, by M. Gaffie.—On the capillary theory of Gauss and its extension to the capillary properties of liquid lines, by M. Lippmann.—New electric lamp, by M. Jabloschkoff.—On the quadrant electrometer of Sir W. Thomson, by M. Benoit.—Complement to the theory of the microscope and the dark chamber, by M. Neyreneuf.—Experiments of static electricity, by M. Grisson.

May.—On the observation of the infra-red part of the solar spectrum by means of the effects of phosphorescence, by M. Edm. Becquerel.—Determination of the polar distance in magnets, by M. Benoit.—Electric variation produced by contraction of the heart in the living man, by M. De la Roche.—On a new industrial application of heat, called the thermodynamic motor, by M. Ferd. Tommasi.—On the absorbent power of moist air, by M. Hoorweg.—On refrigerating mixtures of snow and sulphuric acid, by M. Pfaunder.

Morphologisches Jahrbuch, vol. iii. Part 1.—Oscar Hertwig, contributions on the formation, fertilisation, and cleavage of the animal ovum, part second (*Hæmopsis*, *Nepheleis*, *Rana temporaria*, and *R. esculenta*), 86 pages, 5 plates.—A. Rauber, the fixation of long bones in joints, and the form of the bones.—W. Moldenhauer, the development of the middle and outer ear, 56 pages, 4 plates.

Reale Istituto Lombardo di Scienze e Lettere, Rendiconti, vol. x. Fasc. vii.—Two new mycetes parasitic on vines, by M. Cattaneo.—On a cause little estimated in the pathogenesis of some female diseases, by M. de Giovanni.—The molecular velocity of gas and the corresponding velocity of sound, by M. Brusotti.

SOCIETIES AND ACADEMIES

LONDON

Chemical Society, June 7.—Dr. Gladstone in the chair.—The following papers were read:—On the gases inclosed in lignite coal and mineral resin from Bovey Heathfield, by J. W. Thomas. Four samples were examined, two of which contained much hydrated oxide of iron in the cleavages. The gases consisted chiefly of carbonic acid, carbonic oxide, nitrogen, and sulphuretted hydrogen. In one case sulphur sublimed off in yellow crystals; organo-sulphur compounds, mercaptan, sulphide of allyl, &c., were also present in the gases. The lignites resemble cannel coal more than any other of the true coals as regards the occluded gases, but are far less stable, decomposing, *in vacuo*, below 200° C., whilst the true coals resist a temperature of 300° C. It seems probable that the iron pyrites of true coal have derived their sulphur from that existing in organic combination in the plants from which coal is produced.—On apparatus for gas analysis, by Dr. Frankland. The author proposes to substitute for the india-rubber cork, which has several disadvantages, at the bottom of the water-cylinder, a cast-iron base through which the two glass tubes pass, and are firmly clamped by a wooden clamp; the latter is screwed to the cast-iron base. The most important improvement is, however, the removal of the steel clamps which connect the laboratory and measuring tubes. These are replaced by a glass cup at the top of the measuring tube into which fits the drawn-out end of the laboratory tube, covered with thin sheet-india-rubber; this flexible joint, when wetted and covered with mercury, is quite air-tight.—On narcotine, cotamine, and hydrocotamine, Part V., by Dr. Wright. The preparation of bromhydrocotarnine hydrobromide, bromocotarnine hydrobromide, and tribromhydrocotarnine hydrobromide is described; the second of these bodies, when heated to 200° splits into a new base, tarconine, and a large amount of an indigo-blue substance; the latter body is very insoluble, but dissolves in strong sulphuric acid, forming a magnificent intense purplish solution. Bromocotarnin crystallises in fine scarlet crystals. Noropianic acid and other substances were also prepared and their properties examined.—On otto of limes, by C. H. Piesse and Dr. Wright. A terpene-like body boiling at 176° C. was obtained which yielded but little cymene. The residue in the retort, after standing two to three months, formed a quantity of crystals. These crystals were investigated and their composition determined.—On primary normal heptyl alcohol and some of its derivatives, by C. F. Cross. Pure œnanthol was prepared with a specific gravity of 0.823 at 16° C. Pure heptyl alcohol is colourless, has an agreeable odour, sp. gr. at 0° 0.833, boils at 175°. Heptyl chloride, bromide, iodide, acetate, and œnanthylate were prepared and examined; their boiling-points closely agree with those calculated by Schorlemmer.—On the transformation of aurin into rosanilin, by Messrs. Dale and Schorlemmer. The authors find the spectra of the hydrochlorides of their new base, and rosaniline quite identical; they have also prepared from their base Hofmann's violet, aniline blue, and aniline green.

Geological Society, May 23.—Prof. P. Martin Duncan, F.R.S., president, in the chair.—Richard George Coke, Robert Slater, and William Swanson were elected fellows of the Society.—The president read a letter from Mr. C. J. Lambert, announcing that he had allotted the sum of 500l. to the Geological Society out of the 25,000l. left by his father for distribution. The president further announced that the sum of 500l. had already been paid to the Society, and would be invested for its benefit.—The following communications were read:—Remarks on the coal-bearing deposits near Erekli, the ancient Heraclea, Pontus Bithynia, by Rear-Admiral T. A. B. Spratt, C.B., F.R.S.