

some ten different substances. The curves are very regular and characteristic, and he considers that with those spectra, in which the absorption continuously increases from one end to the other, a measurement of the light intensity at six or eight parts of the spectrum is quite sufficient, in order to construction of the whole absorption curve, and determining the relation of absorption to the wave-length of the light.—Attention is directed to some new physical phenomena: thus M. Kundt has observed a well-marked dichroism in certain substances (such as caoutchouc and gutta-percha) on stretching. Examined with a dichroscopic lens a thin strip gave two images, one dark brown, the other nearly straw-yellow; the ray whose vibrations are in the direction of stretching is the most absorbed.—M. Antolik studies what he calls the "gliding" of electric sparks; a phenomenon which is had, if *e.g.* a spark be made to strike a soot-smearred glass ball. The path-trace left by the spark shows two light parallel lines, and a dark one between; the former are due to thrusting aside of the soot, and, in the dark band, the soot seems compressed, for, on washing the globe, the soot remains there after the rest has gone. The outer edge of the light band shows, in the microscope, a number of dark and light triangles, apparently produced by induction.—M. Obermayer describes phenomena presented by the dispersion of some solutions of aniline colours in water.—M. Edlund rejects, as inadequate, a recent experimental investigation, by Prof. Røitii, of the question: Is the galvanic current an ether current? and M. Reye replies to M. Zöllner on the subject of sun-spots and protuberances.—A Japanese toy-bird is the topic of a note by M. Erdmann. The bird is placed with its back on a board, by means of which it is thrown forward; and after rising 8 ft. or 9 ft. in a parabolic curve, it returns, head foremost, to the thrower.—M. Nordenskjöld furnishes some particulars as to the nature of cosmic dust which had been observed to fall, with atmospheric precipitates, in the neighbourhood of Stockholm.—Among the matter selected from other serials we may note an account of M. Wiedemann's researches on the elliptical polarisation of light, and its relation to the surface colours of substances; and remarks on the arrangement of a *dispersimeter*, by M. Mousson.

### SOCIETIES AND ACADEMIES

#### LONDON

Royal Society, April 23.—Note On the minute anatomy of the alimentary canal, by Herbert Watney, M.A., Cantab. Communicated by Dr. Sanderson, F.R.S., Professor of Practical Physiology, University College.

Zoological Society (anniversary), April 29.—Viscount Walden, F.R.S., president, in the chair.—The report of the council, which was read by the secretary, Mr. P. L. Sclater, F.R.S., stated that the number of ordinary members of the Society on January 1 last was 3,173, of foreign members 25, and of corresponding members 196.—The total income of the Society in 1873 was 28,099*l.*, being 1,371*l.* more than that of 1872, and exceeding the income of any previous year, even those of the years 1851 and 1862, when the Great and International Exhibitions were held, which have hitherto been regarded as exceptional years. The total ordinary expenditure of 1873 had been 22,721*l.*, and 4,945*l.* had been likewise devoted to extraordinary expenditure, leaving a balance of 1,384*l.* to be carried forward for the benefit of the current year. The assets of the Society on December 31, 1873, were calculated at 10,530*l.*, while the liabilities were reckoned at 5,490*l.* The reserve fund consisted at the close of the year of a sum of 8,000*l.* reduced three per cents., but it had been resolved to increase this fund by investing the interest of it from time to time, and by purchasing a further sum of like stock to the amount of 500*l.* every year. The scientific publications of the Society for 1873 had consisted of the usual octavo volume of "Proceedings," and of three parts of quarto "Transactions." The most important work undertaken in the Society's gardens in 1873 had been the rebuilding of the main refreshment-room in the South Gardens at a total cost of 2,096*l.* The total number of visitors to the Society's Gardens in 1873 had been 713,046, being 64,958 more than the corresponding number in 1872, and exceeding that of any previous year since the Gardens had been open to the public. The number of animals in the menagerie on December 31, 1873, was 2,187. Many of the accessions during the year had consisted of specimens of rare or little known animals, of which full particulars were given. The report concluded with a long list of donors and their several donations to the menagerie. The adoption

of the report was moved by Mr. J. Stewart Hardy, M.P., seconded by Prof. Tennant, and carried unanimously. The meeting then proceeded to elect the new members of council and the officers for the ensuing year, and, a ballot having been taken, it was found that Viscount Walden, F.R.S., had been elected president, Mr. Robert Drummond, treasurer, and Mr. P. L. Sclater, F.R.S., secretary to the Society. The new members of council elected were Robert Hudson, F.R.S., the Marquis of Ripon, K.G., Lord Arthur Russell, Osbert Salvin, F.R.S., and Lord Walsingham.

Anthropological Institute, April 28.—Prof. Busk, F.R.S., president, in the chair.—Mr. H. H. Howorth read a paper, entitled *Strictures on Darwinism*; part 3, on *Gradual Variation*. The paper was in continuation of a series in which the author endeavoured to show that Mr. Darwin's main conclusion is not supported by the evidence of the changes of type that can be examined. Mr. Darwin differed from the older naturalists in assigning, as the cause of variation, a struggle between the individuals of a class for existence by which a favoured individual and its progeny eventually survive. They, on the contrary, argued that variation is induced by a change in the external conditions of climate, food, &c., which operate upon the whole class together and make it change, as a whole, in a certain definite manner and direction, that is in one which can be actually predicted. So that if any individual of a class or any number of individuals of a class be subjected to a certain alteration of conditions, a certain definite and uniform change will be produced in the individual or the class. Again if the new conditions were annihilated, the object of the experiment is reverted to its original surroundings. The author supported that argument by a large number of facts, and in doing so was constrained to conclude that the operating cause of variation in man, as in the case of plants and animals, is the working of external causes; and that an individual with its progeny is not so much better fitted for enduring the new conditions that it eventually supplants the rest, but rather that the whole class is moulded together into a new shape, which is called a new variety. Some facts were drawn from the experience of history showing that where the conditions have been uniform, as in Egypt, although there has been a considerable mutual pressure among the individuals of a class (or food, &c.), yet there has been no variation, while a transplanting of similar individuals, as in the case of European emigration to America, has been followed by almost immediate change. The illustrations that might be drawn from the cases of man, as in the changes that have ensued in both the Aryan and the black emigrants to North America, of the Dutch to the Cape, of the Portuguese to South America, &c., were notable and telling instances of the operation of the law argued for by the author, inasmuch as changes of type of a marked character have occurred where there has been neither time nor opportunity for the creation of a fresh type by the successive amelioration or change in the idiosyncrasies of the descendants of a common ancestor, but where the change has undoubtedly occurred in the whole class together over a very wide area.

#### DUBLIN

Royal Irish Academy, March 16.—Rev. J. H. Jellett, B.D., president, in the chair.—The minutes of the previous meeting having been read and confirmed, Dr. Ingram, secretary to the council, read the annual report, which referred to the work done by the Academy during the previous session, the state of the museum, &c. Seven members were lost by death during the year.—At the conclusion of the report, a ballot took place for the election of president and council. Dr. Stokes, F.R.S., was declared duly elected president, and the following officers were elected:—J. R. Garstin, LL.B., treasurer; E. Perceval Wright, M.D., secretary; J. T. Gilbert, librarian, and Dr. R. M'Donnell, F.R.S., secretary of foreign correspondence.

April 13.—Dr. Stokes, president, in the chair.—A paper was read by M. Donovan on some Improvements of a Comparable Self-acting Hygrometer.—John Casey LL.D., read a paper on a new method of finding the Equation of the Squares of the differences of the roots of a Biquadratic, given by its general equation.—Mr. H. W. Mackintosh read a paper on the Anatomy of the Coatimondis and Marten. During the summer of last year two species of the coatimondis (*Nasua narica* and *N. fusca*), and two specimens of the common species of marten (*Martes foina*), which formed part of the collection in the Dublin Zoological Gardens, having died, were obtained for the Dublin Uni-

versity Museum, and through the kindness of Dr. Macalister I had the opportunity of assisting him in dissecting them. *Nasua narica*, as doubtless many are aware, has a very long and flexible snout, and hence we found the facial muscles correspondingly better developed in it than in the others. Trapezius, which is tripartite in all, is remarkable in *N. fusca* for sending from its clavicular portion a slip to the humerus and also for being joined to brachialis anticus. Omohyoid was completely absent in the Coatis, but represented by a fine muscular band in Martes. Teres major is remarkable in Martes for being inserted into the humerus free from the tendon of the latissimus dorsi. Pectoralis major has the usual band from the presternum to the humerus; in *N. fusca*, besides the two laminae from the whole sternum, and from the mesosternum respectively to the pectoral ridge, and greater tuberosity of the humerus, there was a third portion arising from the abdominal parietes and inserted below the humeral tuberosity. The clavicle being rudimentary, the subclavius, as is generally the case amongst carnivores, had disappeared. Acromial deltoid in *N. narica* has some of its fibres continuous with those of brachialis anticus. There was a perfectly separate prescapular slip of subscapularis in *N. fusca*, but not in the other two pronator radii teres passes in all to be inserted below the distal half of the radius. The extensor of the little finger sends tendons to the third and fourth, as well in *N. fusca* and Martes; but in *N. narica* there is a separate extensor *quarti et tertii digiti*. In the hind limb, sartorius has a double insertion into the tibia and into the patella and femoral condyle, the former segment being fused with gracilis. *N. narica* has a distinct aginator caudae, which is represented in the marten by the caudal origin of the biceps femoris. Bicipiti accessorius is distinct in the Coatis, but inseparable from triceps in Martes, in which also gastrocnemius externus and plantaris are fused. Tibialis anticus is double in Martes, one part arising anterior to the other and being inserted beside and separate from it.—Dr. Collins read a paper On accessory Lobes of the Human Lung. The specimen exhibited presented an accessory lobe of the right lung, lying above the root, and invested by a pleural duplicature, which contained in its lower free margin the azygos vein, and in its external border the superior intercostal. Reference having been made in detail to seven similar cases noticed in different parts of Europe, special stress was laid upon a unique case detailed by Wrisberg of a lobe having similar relations upon the left side, as conclusively establishing the mode of origin of the lobe in connection with the development of the azygos, and superior intercostal venous systems. The author regarded these as the only true accessory lobes yet described in man. Mention was made of other so-called accessory lobes, particularly one described by M. Pozzi, below the right bronchus, from its apparent homology to the mammalian lobus impar, and a similar one upon the left side, described by Prof. Recktorzik. These, however, the author regarded as merely higher developments of pulmonary notches, which in not a few instances are normally to be found. The paper, which was illustrated by the recent specimen and by drawings, concluded with an allusion to accessory bronchi in their connection with the subject.

PARIS

Academy of Sciences, April 27.—M. Bertrand in the chair.—The following communications were read:—Fourth memoir on chemical dynamics, by M. Becquerel, a continuation of the author's electro-chemical researches.—On freezing mixtures, by M. Berthelot. The author concluded, from his researches, that by application of the resources indicated by theory, a much lower temperature ought to be obtained than has hitherto been reached.—Study and experiments upon sulphides: alkaline sulphides, by M. Berthelot, a continuation of the author's thermo-chemical researches.—M. Kronecker contributed an algebraical paper on quadratic and bilinear forms.—Note on the decomposition of the work done by forces, M. A. Leduc. The author gave a rigorous enunciation of Luca's theorem relating to the division of the work done by forces in a material vibrating system.—The production of gum in fruit trees considered as a pathological phenomenon, by M. E. Prillieux. Trees affected by this malady were stated to be cured by making longitudinal incisions in the branches.—On uncursal curves, a geometrical memoir by M. Painvin.—Orbit of the double star  $\gamma$  Virginis, by M. C. Flammarion. This system offers the unique case of an elliptical orbit facing us in a plane exactly perpendicular to the line of sight, so that no distortion of the ellipse due to perspective is perceived.—On the conclusions to be drawn from the application of thermo-chemical theorems to ex-

plosive bodies in general and to gunpowder in particular, by M. F. Castan.—On the thermal conductivity of rocks and of bodies in general, by M. E. Jannettaz. The law which regulates the propagation of heat in crystals appears to the author a particular case of the general law that heat is propagated most easily in the direction of least cohesion.—Determination of the age of the human embryo by the examination of the evolution of the dental system, by M. E. Magitot. The results are likely to be of great service in medico-legal cases.—M. E. Combes presented a note on a theorem concerning simultaneous partial differential equations.—Direct construction of the radius of curvature of the curve of apparent contour of a surface projected orthogonally on a plane, by M. A. Mannheim.—On the limit of the degree of the primitive groups which contain a given substitution, a mathematical note by M. C. Jordan.—Elements and ephemerides of the planet (127), by H. Renan.—On the elementary law of electrodynamic actions, by M. J. Moutier.—Observations on Tyndall's experiments on the acoustic transparency and opacity of the atmosphere, by M. Baudrimont. The author stated that the given explanation of the phenomenon of acoustic extinction might be true, but did not seem sufficiently demonstrated to be admitted without submission to a special inquiry, and concluded by stating that the observations were made to be considered by Prof. Tyndall only as means offered to him for the verification of facts of such great importance.—Study of the properties of explosive bodies, by F. A. Abel.—On the employment of oxygen mixed with atmospheric air in respiration, by M. A. Gaudin. The author confirmed the results obtained by MM. Crocé-Spinelli and Sivel in their last balloon ascent.—On a burying-place of the ancient Troglodytes of the Pyrenees superposed upon a (funeral) hearth containing human remains associated with sculptured teeth of the lion and bear, by MM. L. Lartet and Chaplain-Duparc.

BOOKS RECEIVED

BRITISH.—Physiology for Practical Use. 2 vols. Edited by James Hinton (H. S. King & Co.).—A Treatise on Food and Dietetics: Dr. Parry (Churchill).—Sanitary Arrangements for Dwellings: W. Eassie (Smith, Elder & Co.).—Thorpe's Qualitative Chemical Analysis (Longmans)—Principles of Mechanics: Goodeve (Longmans).—Year Book of Facts: Timbs (Longmans).—Surface Zones of the Globe: Keith Johnston (W. & A. K. Johnston).—Lectures on Experimental Chemistry: Prof. Reynolds (Hodges, Foster & Co.).—Mechanics: Willson (Thacker).—Pickering's Physical Manipulation (Macmillan).—Physiology: F. de Guér. Clark (S.P.C.K.).—Geology: T. G. Bonney (S.P.C.K.).—Africa: A. Gruar Forbes (Low & Co.).—Proceedings of the Royal Society of Edinburgh.  
AMERICAN.—The Constants of Nature. Part I. (Smithsonian Institute). Compiled by F. W. Clarke, S.B.—A History of American Birds: S. F. Baird, T. M. Brewer, and R. Ridgway (Little, Brown & Co.).—The Unity of Creation: F. K. Kingston (Trübner).  
COLONIAL.—General Report of the Great Trigonometrical Survey of India during 1873: Col. J. T. Walker (Dehra Doon).—Geological Survey of Canada. Report for 1873: (Dawson).—Report of the Secretary for Agriculture, Victoria.—Transactions of the Royal Society of Victoria.  
FOREIGN.—Statique des Liquides. 2 vols. J. Plateau (Gauthier Villars).—Association Française. 1st session. Comptes Rendus.—Histoire de la Creation: E. Haeckel (Reinwald, Paris).—Schriften der Naturforschenden Gesellschaft in Danzig. 1873.—Les Explorations Sous-Marines.—Elements de Geologie et de Palæontologie: Ch. Contejean (Baillière).—Principes de Geologie: Gustave Dollfus (Savigi, Paris).—Verhandlungen Zoologisch Botanischen Gesellschaft in Wien, Band xxiii.

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