Mr. H. C. Sorby, F.R.S., the Secretary, Mr. R. P. Grey, F.G.S., and the Council is composed of men whose names are well-known in science.

THE head of the publishing firm of Didot, died a few days ago at the age of eighty-six. The deceased was a member of the Academy of Inscriptions, and under his direction the firm published a number of valuable scientific books. The Didot firm hold the office of printers to the French Institute, M. Gauthier Villars being only printer to the Academy of Science.

THE second annual meeting of the members of the Scientific Club was held at the Club House, Savile Row, on Thursday, the 17th Feb. Major F. Duncan, D.C.L., Chairman of the Committee, presided. The Report of the Committee, showing the rapid progress the Club had made during the past year, was unanimously adopted.

WE are asked to state that supplemental meetings for the reading and discussion of papers by students of the Institution of Civil Engineers have been appointed for the following Friday evenings :—February 25, March 3, 10, 17, 24, and 31. The chair will be taken at 7 o'clock on each evening, and successively by Dr. Pole, F.R.S., Sir W. G. Armstrong, C.B., F.R.S., Mr. H. Hayter, Mr. Woods, Mr. Brunlees, and Mr. Berkley, Members of Council.

AMONG the papers in the published "Proceedings" of the Belfast Natural History and Philosophical Society for 1874–75 are the following :—Presidential Address on atoms and automata, by Joseph J. Murphy, F.G.S.; On some Irish Palæozoic fossils, by Rev. John Grainger, D.D.; On the water-bearing strata between Moira and Lurgan, by Robert Young, C.E.; On the geographical distribution of mammals, by R. O. Cunningham, M.D., Professor of Natural History, Queen's College, Belfast; A suggestion on chemical notation, by the president, Joseph John Murphy, F.G.S.; Further notes on some of the swimming birds frequenting Belfast Lough, with special reference to the Great Northern Diver, by R. Lloyd Patterson.

THE additions to the Zoological Society's Gardens during the past week include a Virginian Eagle Owl (*Bubo virginianus*) from N. America, presented by Mr. H. Knight; two Widgeons (*Mareca penelope*), a Common Wild Duck (*Anas boschas*), a Lesser Black-backed Gull (*Larus fuscus*), three Herring Gulls (*Larus argentatus*), two Common Gulls (*Larus canus*), three Black-headed Gulls (*Larus rudibundus*), European, presented by Mr. C. Clifton; a Common Otter (*Lutra vulgaris*), European, received in exchange; a Darwin's Pucras (*Pucrasia darwini*) from China, a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, deposited; a Zebu (*Bos indicus*) born in the Gardens.

SCIENTIFIC SERIALS

THE *American Naturalist* has changed its form this year. In future it is to be published by Messrs. H. O. Houghton and Co., Cambridge, Mass., under the editorship of Dr. A. S. Packard, jun. The amount of matter is increased, and the articles will be of a more popular nature than previously. A department of Geography and Travel is added, and Dr. R. H. Ward, of Troy, N.Y., will superintend the Microscopy. There seems to be considerable difficulty in the production of a science journal in America, and we think that there is still room for improvement. The first paper in the January number is on "Burs in the Borage family," by Prof. Asa Gray, in which a new form, named *Harpagonella*, is described, having been obtained by Dr. E. Palmer, from Guadalupe Island, off Lower California.—The Rev. S. Lockwood describes the habits of the "Florida Chameleon" (*Anolis principalis*).—Mr. David Scott writes on the proper specific name of the Song Sparrow, *Melospiza fasciata* (Gondin), not *M. melodia* (Wilson).—Mr. J. C. Russell shows of what great value the New Zealand Flax (*Phormium tenax*) would be if a method of cleaning it could be discovered.—Mr. J. A. Allen discusses the availability of certain Bartramian names in ornithology, and opposing Dr. Coues' desire to establish some of them. A list is given of those of Bartram's names which Dr. Coues wishes to re-establish.—Prof. N. S. Shaler describes the first session of the Harvard Summer School of Geology.—Ancient ruins in S.W. Colorado are illustrated and described from photographs taken by Mr. W. H. Jackson, the photographer to Prof. Hayden's United States Geological Survey of the Territories, including a house, a round tower, and a square one of Indian construction.—Reviews of Sach's "Botany" (English translation) and Caton's "Summer in Norway," with badly-engraved drawings, are given, together with notes, &c., which conclude the number.

Poggendorff's Annalen der Physik und Chemie., No. 11, 1875.—The tuning-fork has become an important instrument in physical observations, and this number of the *Annalen* begins with a description of experiments by Dr. Ettingshausen, with a stroboscopic tuning-fork apparatus, in which the motion of an electromagnetically excited fork is observed through slits arranged in connection with another fork of nearly the same pitch placed near it. The following are some of his results :—Compared with pendulum motion, that of tuning-forks is somewhat retarded in the inward course, and accelerated in the outward. The vibration time considerably increases with increase of the time of closure of the circuit. The electro-magnetically excited fork vibrates (where the divergences are not too great) more quickly than if the vibrations were caused by elasticity alone. With equal amplitude the duration of vibrations increases slightly with the time the apparatus has been in action; and it decreases with increasing density of the surrounding air.—Electric phenomena occupy a large share of attention in this number, especially various actions of the spark. M. Peters, extending the researches begun by M. Antolik on "gliding" electric sparks, describes effects obtained by letting the spark glide on smoked paper brought near the machine on a glass table. The trace of the flash showed three different parts, each about a third of the whole length. In the *positive third* were numerous branchings outwards from a middle part, which consisted of a succession of parallel dark and bright strips (the darkest in the middle); the *negative third* showed no branchings, and the parallel strips were in reverse order; the *middle third* was distinguished by a greater width and brightness. M. Peters seeks to account for these phenomena. In another note he points out some differences between spark-forms from large inductors and those from the Holtz machine.—A paper by MM. Mach and Wosyka, also suggested by Antolik's experiments, furnishes reason for thinking that the soot figures produced are due to air motions, and especially sound motions.—Again, M. Riess gives an account of the phenomenon of weak electric sparks (as he called them), which differ from the ordinary strong sparks in form, light, sound, and other properties. A mode of producing them was formerly described. He observes that the greater length of the negative electrode has no essential connection with their production, and that, in regard not only to length, but to light and sound, they are independent of the composition of the circuit in which they occur.—Some striking new light phenomena of electricity are also described by M. Holtz.—In a note on the dielectric constants of liquids, M. Silow furnishes experimental proof of a proposition of Helmholtz with regard to attraction of two electric masses situated in an insulating medium, and a valuable paper by M. Herwig treats of the magnetisability of cylindrical iron pipes in different directions; he considers that in addition to the forces hitherto taken into account, there are further molecular magnetic forces which are of the greatest importance. These act within a magnetic line in the direction of the entire magnetisation, and in interrupted portions of a magnetic line in the contrary direction.—MM. Hildebrand and Norton endeavour to fill up some gaps in our knowledge of the properties of metallic cerium, lanthanum, and didymium; having obtained these elements by the help of the electric current, according to Bunsen's method, in quantities of nearly fifty grammes.—A note on impact machines is contributed by M. Sedlaczek.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, Feb. 18.—Annual General Meeting.—John Evans, F.R.S. president, in the chair.—The Secretary read the reports of the Council and of the Library and Museum Committee for the year 1875. The position of the Society was

described as very satisfactory, although owing to various extraordinary expenses, the expenditure of the year was considerably in excess of its income. The Society was stated to be in a prosperous state, and the increase in the number of Fellows to be greater than in any previous year. The report also referred to the bequest by the late Sir Charles Lyell of the die of a medal and of the sum of 2,000*l.*, a bronze copy of the former and the interest of the latter to be given annually or from time to time by the Council as a mark of honorary distinction to some person or persons who shall be regarded as having aided the progress of Geological Science. It was also announced that Dr. Bigsby, F.R.S., has offered to found a bronze medal to be given in alternate years as an incentive to the study of Geology. The President then presented the Wollaston Gold Medal to Professor Huxley, F.R.S.; the balance of the proceeds of the Wollaston Donation Fund to Mr. J. Gwyn Jeffreys, for transmission to Professor Giuseppe Seguenza, of Messina, F.C.G.S.; the Murchison Medal to Professor Ramsay for transmission to Mr. A. R. C. Selwyn, F.R.S,; the balance of the Murchison Geological Fund to Professor Ramsay for transmission to Mr. James Croll; and the first Lyell Medal and the entire proceeds of the Fund to Professor Morris, F.G.S. The President then proceeded to read his anniversary address, an abstract of which we give on another page. The ballot for the Council and Officers was taken, and the following were duly elected for the ensuing year:—President: Prof. P. Martin Duncan, F.R.S. Vice-Presidents: Sir P. de M. Grey Egerton, Bart. F.R.S.; R. A. C. Godwin-Austen, F.R.S.; J. W. Hulke, F.R.S.; Prof. A. C. Ramsay, F.R.S. Secretaries: David Forbes, F.R.S.; Rev. T. Wiltshire. Foreign Secretary: Warington W. Smyth, F.R.S. Treasurer: J. Gwyn Jeffreys, F.R.S. Council: H. Bauerman; Rev. T. G. Bonney; W. Carruthers, F.R.S.; Frederick Drew; Prof. P. Martin Duncan, F.R.S,; Sir P. de M. Grey Egerton, Bart., F R.S.; R. Etheridge, F.R.S.; John Evans, F.R.S.; David Forbes, F.R.S.; R. A. C. Godwin-Austen, F.R.S.; Henry Hicks; J. W. Hulke, F.R.S.; J. Gwyn Jeffreys, F.R.S.; Prof. T. Rupert Jones, F.R.S.; J. W. Judd; Prof. J. Morris; Prof. A. C. Ramsay, F.R.S.; Samuel Sharp, F.S.A.; Warington W. Smyth, F.R.S.; Admiral T. A. B. Spratt, F.R.S.; W. Whitaker; Rev. T. Wiltshire, F.L.S.; Henry Woodward, F.R.S.

Linnean Society, Feb. 17.—J. Gwyn Jeffreys, F.R.S., vice-president, in the chair.—Dr. D. D. Cunningham, Mr. W. C. Tuely, Mr. C. M. Wakefield, and Mr. C. F. White were elected Fellows of the Society.—"Additional observations on Ants," by Sir John Lubbock, Bart. In this paper Sir John communicated some further experiments in continuation of those contained in his last memoir. As regards the cases in which when an ant has found a store of food, other ants make their way to it, he commenced by referring to some of his recent observations. To the edge of a board communicating with the nest he fastened three parallel strips of paper about a foot long (G, H, and I). One of these (G) led to a shallow glass tray containing a number of larvæ. The object of this was to ascertain how many ants would find the larvæ for themselves under such circumstances, and as a matter of fact none did so. On the middle strip (H), near the centre, and at right angles with it he placed two strips of paper 2 inches long, one (K) leading to another shallow tray containing larvæ (F), while the other (L) rested on the third strip of paper (I). He then took an ant (*F. nigra*), marked her, and put her on the tray F. She immediately took a larva, and went away to the nest along the strip of paper H. Now it is obvious that by always causing the marked ant to cross from the strip of paper, H, to the larvæ over a particular bridge of paper, K, and if whenever a stranger came, the paper bridges, K and L, were reversed, it would be shown whether the other ants who came to the larvæ had had the direction and position explained to them. In such a case they would go right notwithstanding the interchange of the paper bridges: but if they found their way by tracking the footsteps of the first ant, they would pass over the paper bridge K, and thus be led away from the larvæ to the strip of paper I. The result was that out of 79 strange ants which came up to the point at which the paper bridges diverged, 24 went straight along the strip of paper, 11 took the right bridge to the larvæ, while 44 were misled and went over the paper bridge K away from the larvæ to the strip of paper I. He then slightly altered the arrangement, transfixing one end of the two paper bridges by a pin, and so fastening them by one end to the strip of paper H, the other ends free, that each of them could be turned either to the larvæ or to an empty glass tray. When the marked ant came he turned one paper bridge, K, to the larvæ, the other, L, to the empty tray; while whenever any other ant came he turned the bridges, so that K led to the empty tray and L to the larvæ. Under these circumstances, seventeen ants which came along the strip of paper H, without a single exception, went over the bridge K to the empty tray. He then varied the experiment by leaving the paper bridge K loose as at first; but instead of having a separate bridge L, he cut the strip of paper H into two pieces, H′ and H″. Then when a strange ant was coming, he rubbed his finger two or three times over the bridge K, so as to remove or at least confuse the scent. As soon as the ant had passed over the first part, H′, of the strip of paper H, and had arrived on the part H″, he took up the piece H′ and placed it where the paper bridge L had been in the previous experiments, *i.e.* so as to connect the end of H with the empty glass tray. By this arrangement the bridge K was left in its place, and, on the other hand, there was a bridge which the marked ant had crossed and recrossed as often as K, but which led away from the larvæ. Under these circumstances, out of forty-one ants which found their way to the end of the strip H, and within two inches of the larvæ, fourteen only passed over the bridge K to the larvæ, while twenty-seven went over H′ to the empty tray. Taking these observations altogether, out of 150 ants which came to the end of the strip of paper H, and thus within two inches of the larvæ, only twenty-one took then the right turn and arrived at their destination. These experiments therefore certainly seem to show that when ants flock to a treasure of food which one of them has discovered, they either accompany one another or else track it out by scent. The fact, therefore, is by no means an evidence of any high intelligence, or any complex system of communication, but is merely an instance of instinct, little higher than that which is found in other social animals. On the other hand, that some higher power of communication does exist, seems, however, to be obvious from some of the facts recorded in Sir John's previous paper. In the latter part of his present paper the author narrated a variety of experiments on the senses of ants, and on their power of recognising friends. A lively discussion followed the reading of the paper, in which Messrs. Lowne, Romanes, Mivart, and McLachlan, &c., took part.—Dr. Cobbold gave a notice of and exhibited several specimens of the new human fluke discovered by Prof. J. F. P. McConnell, of Calcutta. This parasite was first described by Dr. McConnell in the *Lancet*, Aug. 21, 1875. Prof. Leuckart, of Leipsic, unaware that the species had been already named, *Distoma sinense*, proposed the name *D. spatulatum* for it, which thus sinks into a synonym. Dr. Cobbold pointed out how the transparency of the specimens permitted all the internal organs to be well seen, and thus their structure could not readily be confounded with any other known species. The Entozoa found by Dr. Kerr, of Canton, and described by Prof. Leidy, did not belong to the above species, but to the great human fluke (*Distoma crassum*) discovered by Prof. Busk. Details of this last-named parasite have just been published in the Society's Journal. —A paper was read by Dr. John Anderson "On the cloacal bladders, and on the peritoneal canals in Chelonia." The former seem first to have been described by Bojanus in *Emys europœa*, but since have received sparse attention. Dr. Anderson has ascertained their presence in a number of Asiatic genera and species, though they do not occur in others, *Testudo*, *Trionyx*, &c., to wit. He suggests these organs may be related to the habits of life, as it appears they are confined to those animals semi-terrestrial and semi-aquatic in habit, the true land and essentially water-living Chelonians being unprovided with them. Although known that some Chelonia draw in and eject water from the cloaca, the precise functions of the pouches in question have not been clearly determined.—The peritoneal canals have received elucidation fron Cuvier, Is. Geoffroy, and Martin, but as to their relations, functions, and homology, Dr. Anderson is at variance with these *savans*. Basing his views on experimental injection and otherwise, he regards them as not connected with the generative functions, but rather agrees with Dumeril and Bibron as to their being accessory and subordinate to transpiration. He believes they have a distinct origin from the Mullerian ducts, and are homologous with the abdominal pore of Selachians and Ganoids.—The chairman called attention to a letter from the Director of the South Kensington Museum, in which the Committee of Council of Education desire the co-operation of the President and Fellows of the Linnean Society toward furnishing objects on loan for the forthcoming Exhibition of Scientific Apparatus.

Anthropological Institute, Feb. 22.—Mr. J. Park Harrison, treasurer, in the chair—The Director, Mr. E. W. Braybrook, read a paper by the Rev. John Earle, M.A., on the Ethnography of Scotland. The author alluded to the great similarity in the physiognomy of the Norwegians and the Scotch as exhibited in photographic portraits, the likeness between the two peoples having also struck Dr. Beddoe. The conquest of the northern parts of Scotland, and especially Caithness, (Icelandic Kata-ness=ship promontory) is celebrated in the Sagas: and the author believed that the "harrying west" of the Danes along the eastern coast of Great Britain extended at least as far as the Firth of Forth. Vigfusson's Icelandic Dictionary supplies materials to illustrate numerous striking features in the Scottish language and the Norsk, *e.g.* bairn, carline, eldine, ettle, fey, (make); gar, greet, (to weep); speer, firth, &c. The Danish and Norsk districts in Scotland are the meeting ground of the great and divergent branches of the Gothic family—the Teutonic and the Scandinavian. In the Scottish language the Norsk element is almost undiluted with Saxon, and we gain from it Ethnological evidence, which recorded history does not distinctly afford. An analysis of the language Mr. Earle believes would bring out additional proofs that it is the permanent expression of the overlapping of the races above alluded to.

BERLIN

German Chemical Society, Feb. 14.—A. W. Hofmann, president, in the chair.—E. Paterno and G. Briosi made preliminary communications on hesperidine obtained from oranges; 1,000 oranges yield less than 150 grains of the pure substance.—A. Ladenburg has found that isomeric diamines are acted upon by nitrous acid in very different ways. Parametatoluylendiamine yields a well crystallised body $C_7H_7N_3$, amidoazotoluylene.—T. v. d. Hoff finds that succinic acid obtained in reducing malic acid with HI is optically inactive.—V. Wartha has discovered indigo in commercial litmus.—P. Weselsky described a reaction of phloroglucine. Mixed with nitrate of toluidine and nitrite of potassium it yields a precipitate of the colour of cinnabar.—A. Claus has found that the body until lately known as crotonchloral when treated with cyanide of potassium, yields not only chlorocrotonic acid $C_3H_4ClCO_2H$, but also a bibasic acid $C_3H_4(CO_2H)_2$, and tricarballylic $C_3H_5(CO_2H)_3$.—The same chemist described combinations of sulfo-urea with bichloride of mercury, and with oxalic acid.—R. Hasevcleors, in using Deacon's chlorine-apparatus has remarked that the amount of HCl decomposed, sunk within six weeks from 80 to 2 per cent. He found the hydrochloric acid passing through the apparatus to be contaminated with sulphuric acid, and believes this to be the reason of the deterioration of the process. Sulphuric acid, so he believes, is decomposed into sulphurous acid, and oxygen and the sulphurous acid is reoxidised by retransforming the chlorine into hydrochloric acid:—

$$SO_4H_2 = H_2O + O + SO_2$$
$$SO_2 + Cl_2 + 2H_2O = SO_4H_2 + 2HCl.$$

A support of this view is found in the fact that manufacturers that take great care in introducing hydrochloric free from sulphuric acid, are able to use the process for a comparatively longer period.—M. Neneky, who by the action of formic and acetic acids on guanidine obtained formo-guanamine $C_3N_5H_5$, and aceto-guanamine $C_4N_5H_7$, has also obtained two isomeric bases $C_6N_5H_{11}$ by the action on guanidine on butyric and isobutyric acids. Aceto-guanamine, by taking up one or two molecules of water under the influence of potash, respectively yields guanide $C_4N_4H_5O$; guanamide $C_4N_3H_5O_2$. By oxidation it yields cyanuric acid $C_3N_3H_5O_3$.—E. Bandrowsky, treating guanidine with valerianic acid and caproic acid, obtained the corresponding guanamines, $C_7N_5H_{13}$ and $C_8N_5H_{15}$.

PARIS

Academy of Sciences, Feb. 14.—Vice-Admiral Paris in the chair.—The deaths of MM. Andral and Seguier were announced.—The following papers were read:—On the ethers of hydracids, by M. Berthelot.—On the formation of amides, by M. Berthelot.—On hyposulphite of potash, by M. Berthelot.—Memoir on the approximation of functions of very large numbers and on an extensive class of developments in series (second part), by M. Darboux.—Vibrations of a homogeneous solid in equilibrium of temperature, by M. Felix Lucas.—On the movements of the heart when it is submitted to artificial excitations, by M. Marey. The results obtained show that the heart is refractory to excitation during the greater part of its systolic phase. The systole produced (by excitation) is greater the longer its interval from the spontaneous systole which precedes it. After each systole produced, there is a compensating repose which restores the temporarily altered rhythm of the heart. This is important as confirming a law the author believes he has established, viz., that the work of the heart tends to remain constant.—On deviations from the laws relating to gases, by M. Mendéléeff.—On isomerous rosanilines, by M. Rosenstiehl. There are three of these, one derived from 1 molecule of aniline and 2 molecules of toluidine; another, 1 of aniline and 2 of pseudo-toluidine; the third, 1 of aniline, 1 of toluidine, and 1 of pseudo-toluidine; the latter constitutes, for the most part, commercial fuchsine.—On the optical inactivity of the reducing sugar contained in commercial products, by MM. Aimé Girard and Laborde.—On a new element in the determination of chimi-calories, by M. Maumenè. Very various liquids undergo a molecular alteration (readily revealed by chemical action) without their nature being changed; the purely physical influence of heat gives them a sort of temper (*trempe*), during which their chemical actions produce extraordinary numbers of chimi-calories. Olive oil recently heated to about 300° behaves no longer like its former self when treated with hot acid, but it is not perceptibly altered in colour, odour, or density.—On a new acid pre-existing in the fresh milk of mares, by M. Duval. It appears to be distinct from hippuric acid, and the author proposes to call it *equinic* acid.—On the aptitude of oysters for reproduction from the first year, by M. Gerbe. Observation shows this to be a fact. Among these precocious mothers there are some whose shell, in transverse diameter, measures hardly 25 mm. Hence the prosperity of the reproducing portion of a natural oyster bed, does not depend only on the presence of large oysters. The quantity of eggs, indeed, is generally in proportion to the size of the oyster. Many oysters, especially the young, propagate twice in the season, under favourable conditions. The laying of eggs occurs at long intervals, possibly corresponding to lunar phases.—Reply to a note of M. Arm. Gautier, relative to the *rôle* of carbonic acid in the coagulation of blood, by MM. Mathieu and Urbain.—Description of the diplometer, by M. Landolf. This is an instrument for measuring the diameter of an object at a distance and independently of its movements.—On the origin and mode of generation of atmospheric whirlwinds, and on the unity of direction of their gyratory motion, by M. Cousté. The whole mechanism of whirling movements in the atmosphere depends on two causes, gravity and heat; the weight of the air drives vertically from below upwards the less dense water-vapour which the heat has produced; and further, the weight of the air causes this gas to be precipitated (in horizontal, or at least *inclined* directions into the vacuum which the vapour tends to leave behind it in rising.

CONTENTS

ERRATUM.—Vol. xiii. p. 328, last line, for *him* read *me*.