cases balancing one another. When we examine the several groups, 32 in number, which contribute towards the above totals, a remarkable amount of agreement is shown throughout between calculation and observation, such as would raise the art of breeding to a science of considerable precision. The most notable exception is in the sixth column of set 2, where the numbers are 92 and 79, but, as is shown in the memoir, the observed values run there so irregularly with their neighbours, that they cannot be accepted as true representatives. The causes of heterogeneity undoubtedly include the disturbing effects of close interbreeding, because particular hounds of good shape that have also considerable prepotency, are largely bred from.

The author mentions that he had made experiments with the coefficients, altering them slightly and recalculating, and that he found in every case a notable diminution in the accordance between calculation and observation; the test that the law has successfully undergone thus appears to be even more severe and searching than might have been anticipated.

It is hardly necessary to insist on the value to breeders of a trustworthy law of heredity. Vast sums are spent annually in rearing pedigree stock of the most varied kinds, such as horses, cattle, sheep, pigs, dogs, and other animals, besides flowers and fruits. Certainly no popular view at all resembles that which is put forward and justified in Mr. Galton's memoir, which is epitomised here so far as space admits.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Maine State College at Orono will in future be known as the University of Maine.

MR. MUIR, of Halifax University, has been appointed to the chair of Psychology in Mount Holyoke College.

THE Victoria University on Saturday last conferred on Sir George Gabriel Stokes, Bart., the honorary degree of D.Sc.

THE Rev. D. J. Thomas has been appointed Principal of the Home and Colonial Training College, Gray's Inn Road, and of the Highbury Training College for Secondary Teachers.

THE establishment of a fresh-water biological station at Hemlock Lake, under the direction of Prof. Charles W. Dodge, has been sanctioned by the Board of Trustees of the University of Rochester, U.S.A.

THE library building of the University of Iowa was on June 19 struck by lightning, and destroyed by fire. The physical laboratory was on the first floor of the building. The total loss is estimated at about £20,000.

AMONG recent appointments may be mentioned:—Dr. Brault, to be Professor of Tropical Diseases at Algiers; Prof. W. Th. Engelmann, of Utrecht, to be Professor of Physiology at Berlin, in place of the late Prof. du Bois-Reymond.

THE following resignations are announced:—Dr. James Woodrow from the presidency of South Carolina College; President Craighead and Profs. Tompkins and Wright from Clemson College; Dr. W. H. Hervey from the presidency of the Teachers' College, New York.

ACCORDING to *Science*, Prof. Edward L. Nichols, the President of the New York State Science Teachers' Association, has appointed a committee of nine to consider and report at the next annual meeting of the Association on the following topics:—"Science as an Entrance Requirement to Colleges," "Science Teaching in the Secondary Schools," "Nature Study in Primary Schools."

THE June issue of the *London Technical Education Gazette* contains particulars of various courses of science lectures which are to be given in the autumn and winter of this year at University and King's Colleges, and at the Battersea and South-West London Polytechnics. Many of the courses are quite free of charge, and as only a limited number of persons can be accommodated at some of them, early application is desirable.

UNDER the auspices of the American Society for the Extension of University Teaching, a summer meeting is being held at the University of Pennsylvania from July 6 to 30. *Science* announces that two lectures on "Mediæval Science" will be given by Prof. W. F. Magie, and lectures on "Forestry" and "Museums" will be delivered by Prof. J. T. Rothrock and Prof. W. P. Wilson respectively. In Psychology courses of lectures are announced by Prof. L. Witmer, Prof. J. M. Baldwin and Prof. E. B. Titchener. Conferences on the teaching of geography will be led by Profs. W. M. Davis and R. E. Dodge.

SCIENTIFIC SERIALS.

Symons's Monthly Meteorological Magazine, June.—Hailstorm at Seaford, Sussex, May 30, 1897. It can be very rarely proved that a shower of hailstones as large as a hen's egg has fallen over a considerable area in England, but from letters received from various observers this is shown to have been the case during thunderstorms which occurred over the east of England on that day between the Isle of Wight and Lincoln. At Seaford several hailstones were picked up measuring 4½ inches round, and at Maidstone the stones were as large as walnuts; the noise there was so great that the services in nearly all the churches were interrupted.—Heavy rain at Port Elizabeth, Cape Colony, May 5, 1897. The amount measured between 8 a.m. and 1.30 p.m. was over 5 inches, and in three days 7·29 inches were measured.

Bulletin de la Société des Naturalistes de Moscou, 1896, No. 2.—New tertiary mammals found in Russia, by Mme. Marie Pavloff, with one plate (in French). The most important find is that of a bone which was identified as the lower end of the third metacarpus of *Anchitherium aurelianense*, Cuvier; thus being the first *Anchitherium* rest found in Russia. It comes from the neighbourhood of Nikolaieff, where it was found in a layer containing remains of *Mastodon borsoni*. The other remains belong to the Pliocene yellow "Balta Sands," and are: *Rhinoceros Schleiermacheri* (Kaup), *Capreolus cusanus* (Crois. and Job., *teste* Boyd Dawkins), and *Mastodon turicensis* (Schintz). They throw a new light on that interesting formation.—The reptiles of Europe, by Dr. J. Bedriaga, Part ii. *Urodela*. A most elaborate work (in German), containing full indexes of literature, synoptic tables for determination, and full detailed descriptions of the species (to be continued).—On the structure, &c., of the Nematocysts of Cœlenterata, by N. Iwanzoff, with two plates (in German, concluded).—Polar Land and Tropical Flora, by H. Trautschold (in German). Deichmüller having shown that the invariability of the rotation-period of the earth is not probable, and a variation in the position of the earth-axis having been proved, Prof. Trautschold enumerates the geological data, which render very probable that the position of the axis has been slowly displaced in geological times, and which could not be explained otherwise.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, May 13.—"Further Note on the Influence of a Magnetic Field on Radiation Frequency." By Prof. Oliver Lodge, F.R.S., assisted by Mr. Benjamin Davies.

Referring to a former communication of mine, on the subject of Zeeman's discovery, printed on page 513 of the *Proceedings* of the Royal Society for February 11 this year, vol. lx. No. 367, I wish to add an observation to those previously recorded, as I have recently acquired a concave Rowland grating (3½ × 1½-inch ruled surface, 14,438 lines to inch, being the one used by Mr. George Higgs), of which the spectra of the first and third orders on one side are very satisfactory.

It is said on page 513, "If the focussing is sharp enough to show a narrow, dark reversal line down the middle of each sodium line, that dark line completely disappears when the magnet is excited." With the greater optical power now available the dark reversal line is often by no means narrow, and though in some positions of the flame it does still tend to disappear or become less manifest when the flame is subjected to a concentrated magnetic field, the reason of its partial disappearance is that it is partially reversed again—*i.e.* that a third bright line, as it were, makes its appearance in the midst of the dark line, giving a triple appearance to each sodium line.

The following is a summary of the different appearances that may be seen according to the state of the flame and the strength of the field:—

At low temperature, and with the flame forward in the field, when each sodium line is sharp and single, magnetism widens it,

and with a little more power doubles it, causing a distinct dark line down its middle. The same effect occurs with lithium and thallium lines.

At higher temperature, and with the flame partially behind the field, when each sodium line appears as a broad hazy-edged double, magnetisation greatly widens the doubling, pushing asunder the bright components very markedly; stronger magnetisation reverses the middle of the widened dark band, giving a triple appearance; stronger magnetisation still reverses the middle once more, giving a quadruple appearance to the line. In every case a nicol, suitably placed, cuts off all the magnetic effect and restores the original appearance of the line.

The same thing is seen when salts of lithium or of thallium are introduced into the flame; and the components of the doubled red lines are more widely separated than the components of the doubled green lines, the effect being proportional to wave-length. The most interesting line to try was the red cadmium line, since this has been proved to be of specially simple constitution by Michelson. We have recently been able to get the cadmium spectrum well developed by means of a sort of spark arc between the magnet poles, maintained by an induction coil excited by an alternating machine, and we find that the magnetic doubling of the chief lines occurs in precisely the same way with the spark spectrum as with the flame spectrum, and that the red cadmium line behaves in the same way as the others. The magnetic effect is better seen from a direction perpendicular to the line of force when a nicol is interposed in the path of the light, but rotation of the nicol, through 90°, cuts it entirely off, accurately so where a small spark is the source of light.

June 17.—"Kathode Rays and some Analogous Rays." By Silvanus P. Thompson, F.R.S.

(1) The size of the kathodic shadow of an object depends upon its own electric state, as already found by Crookes (*Phil. Trans.*, 1879, Part ii. p. 648). If it is negatively electrified the shadow expands. If it is positively electrified the shadow contracts. The position, as well as the size of a kathodic shadow, may be affected electrostatically; the rays which cast the shadow being repelled from a neighbouring body if the latter is negatively electrified. In some cases the contraction of the shadow of a narrow object that is made positively electrical (anodic) may go so far that the luminous margins approach and even overlap, giving the appearance of a bright or negative shadow in place of a dark one. The enlargement of a shadow when the object is made kathodic, and the diminution of the shadow when the object is made anodic, both depend upon the degree of exhaustion of the tube; and both are augmented up to a certain point by raising the degree of exhaustion. The enlargement when the object is made kathodic vastly surpasses the diminution when the object is made anodic. Kathode rays are capable of being deflected electrostatically; being apparently strongly repelled from a neighbouring kathodic surface, and less strongly attracted towards a neighbouring anode. Two kathode beams from two small disc kathodes can cross through or penetrate one another without interfering with another.

(2) Objects protected by a non-conducting layer of glass do not at moderately low exhaustions, when made kathodic, repel or deflect kathode rays, and their shadow does not enlarge. But at a certain minimum exhaustion they suddenly exert an electrostatic deflection. Naked objects made kathodic deflect the kathode rays at all exhaustions.

(3) Kathode rays cannot be concentrated by reflection either from a non-conducting or a conducting surface, nor by passage through a metal tube which is itself negatively electrified.

(4) When kathode rays strike upon an internal metal target or anti-kathode there are emitted from the latter (both at exhaustions lower than suffice to produce Röntgen rays, and at exhaustions at which those rays are also produced) some internal rays resembling ordinary kathode rays in the following respects:—They produce a similar luminescence of the glass; they cast shadows of objects; they are susceptible of deflection both magnetically and electrostatically. But they produce no Röntgen rays where they fall upon the glass surface. They do not follow either the law of specular reflection, nor that of diffuse reflection, but are emitted from the anti-kathode surface apparently according to a similarly anomalous distribution to Röntgen rays, *i.e.* with nearly equal intensity, at all angles up to 90° with the normal. It is proposed to call these rays *para-kathodic* rays in contradistinction to the ordinary or *ortho-kathodic* rays. From the similarity of their distribution with that of the Röntgen rays it is inferred that the physical processes concerned in their production are identical. These para-kathodic rays are emitted from the anti-kathode both when the latter is made an anode, and when it is neutral or even made kathodic. From an anti-kathode there may proceed at one and the same time, and in one and the same direction para-kathodic rays and Röntgen rays, which, meeting an interposed object, may cast simultaneously two shadows—a para-kathodic shadow on the glass, and a Röntgen shadow on an external screen of barium platinocyanide. The former shadow can be deflected by a magnet, the latter cannot. The former shadow expands if the object is made kathodic; the latter does not.

(5) If thin metal screens are used to sift the kathode rays the luminescent phenomena change. The rays of least penetrating power appear to be most susceptible to magnetic and electrostatic forces. The various constituents of a heterogeneous kathode beam are emitted in various proportions at different degrees of exhaustion. In the kathode rays emitted at higher degrees of exhaustion there is a greater proportion of the less-deflectable rays. The least-deflectable rays are those which most readily penetrate through a perforated screen when that screen is itself negatively electrified.

When ordinary kathode rays fall upon a perforated screen which is itself made kathodic, or are attempted to be passed through a negatively electrified tube, there emerge beyond the screen or tube some rays, here termed *dia-kathodic* rays, which differ from the ortho-kathodic, and also from the para-kathodic rays. These dia-kathodic rays are not themselves directly deflected by a magnet. They show themselves as a pale blue cone or streak. Where they fall on the glass they do not excite the ordinary fluorescence of the glass. The dia-kathodic rays excite, however, a different or second kind of fluorescence; the tint in the case of soda-glass being a dark orange. Intervening objects in the beam or cone of dia-kathodic rays cast shadows. The orange fluorescence evoked on soda-glass by the dia-kathodic rays shows in the spectroscope the D lines of sodium only. The shadows cast by dia-kathodic rays are not deflected by the magnet, nor do they change their size when the object is electrified.

"Fifth Report to the Royal Society Water Research Committee." By H. Marshall Ward, F.R.S., Professor of Botany in the University of Cambridge. Presented to the President and Council, December 10, 1896.

The following conclusions show the principal points resulting from three years' study of the Bacterial Flora of the Thames:—

(1) Very many forms occur in the Thames, some of which are pathogenic under certain conditions.

(2) The "species" of the descriptive hand-books—principally medical—are frequently not species at all, in the botanical sense, but varieties, or growth-forms, the distinctive characters of which are not constant. These so-called species need revision and grouping around types, which may turn out to be the true species.

(3) The characters derived from the behaviour of colonies are not sufficient for the determination of species, and how far they may be employed in conjunction with other characters will only be elucidated by advances in our knowledge of the way the colonies are built up by the growing bacteria on the given media.

(4) The effects of definite changes in the environment on the media are of great importance, but have hardly been noticed as yet. Plate-colonies on gelatine, for instance, develop quite differently, according to the condition of the gelatine; so that a feeble and slow-growing bacterium produces colonies quite unlike those developed by the same species when vigorous and quickly growing, not only owing to its peculiarities of growth as a feeble form, but also because the gelatine has altered during the intervening period.

(5) The effect of changes of the environment on the growing organism itself is recognised as important.

(6) With especial reference to the Thames bacteria, the past history of the organism isolated from the river implies causes of variation. The river water is a poor nutritive medium, and the organism is exposed to great changes of temperature, light, movement, &c., during its sojourn therein. Consequently the time it has been in the river affects the behaviour of the organism when isolated, just as we know that a bacterium is affected by the previous conditions of its culture in other media. Hence two colonies on a plate may look very different, and yet belong to the same species, one being developed from a cell

that had been many days or weeks in the water, the other from one that had only been there a few hours. It may need weeks or months of cultivation under constant conditions to establish the identity of the two.

Linnean Society, May 24.—Anniversary Meeting, Dr. A. Günther, F.R.S., President, in the chair.—The report of the Librarian having been read, the President opened the chief business of the meeting, when the Fellows present proceeded to ballot for the President, Officers, and Council for the ensuing year. Scrutineers having been appointed, and the votes counted, the result was declared to be as follows:—President, Dr. Albert Günther, F.R.S.; Treasurer, Mr. Frank Crisp; Secretaries, Mr. B. Daydon Jackson and Prof. G. B. Howes. The President then delivered the annual presidential address, which, on the motion of Mr. C. B. Clarke, seconded by Prof. Stewart, it was resolved should be printed and circulated. The gold medal of the Society was formally awarded to Dr. J. G. Agardh, Emeritus Professor of Botany in the University of Lund, and, in consequence of his inability to receive it in person, was delivered on his behalf to his Excellency the Minister for Sweden and Norway, who made a suitable acknowledgment.

June 3.—Dr. A. Günther, F.R.S., President, in the chair.—Prof. G. B. Howes exhibited specimens of the remarkable Crustacean *Anaspides tasmaniæ*, from the Hartz Lake, Huon district, Tasmania, which he had received from Mr. G. M. Thomson, its discoverer (see *Trans. Linn. Soc.*, Zool. [2] vol. vi. p. 287), together with a letter stating that the animal is now known from three localities. He directed attention to a recent monograph by Calman (*Trans. R. Soc. Edinb.*, vol. xxxviii. p. 787), in which the conclusion was drawn that the "Pod Shrimps" of the genera *Acanthotelson*, *Gampsonyx*, and *Palæocaris*, in respect to characters in which they are anomalous, agree with *Anaspides*, and that the four genera are probably to be referred to an ancient group of primitive Malacostraca. He remarked that he was disposed to agree with Calman's determination of the morphological value of the "first thoracic segment" of Thomson, and that he could confirm his statement that the peduncle of the flagellum of the antenna was but two-jointed.—The Rev. T. R. Stebbing, F.R.S., threw doubts upon the association claimed by Calman for *Acanthotelson*, and remarked that some Amphipods are known to agree with *Anaspides* in the possession of double epipodial lamellæ. The "ocellus" of Calman did not appear to him to occupy the position of an ocellus, and he thought it might possibly be a luminous organ.—Dr. G. D. Haviland, F.L.S., gave the substance of a paper on *Termites*, illustrated by lantern-slides, showing some of the more characteristic and remarkable forms of nests made by these insects, as well as figures of the insects themselves. A discussion followed, in which Mr. Saville Kent, the Rev. T. R. Stebbing, and the Rev. F. C. Smith took part; Mr. Kent exhibiting another series of lantern-slides illustrating the nests of Australian species.—Prof. T. Rupert Jones, F.R.S., communicated a paper by himself and Mr. F. Chapman on the genus *Ramulina*, forming the second part of a paper of which the former portion, on the tubulose and fistulose Polymorphinæ, has been already published (*Linn. Soc. Journ.*, Zool. xxv. p. 496).—The Secretary communicated a paper, by Mr. E. C. Horrell, on the number of sterigmata and spores in *Agaricus campestris*.

June 17.—Dr. A. Günther, F.R.S., President, in the chair.—Dr. D. H. Scott, F.R.S., exhibited original preparations by Prof. Ikeno and Dr. Hirase, of Tokio, Japan, illustrating their discovery of spermatozoids in two Gymnospermous Phanerogams, namely, *Ginkgo biloba* and *Cycas revoluta* (*cf.* Bot. Centralblatt, Bd. lxix. Nos. 1–2, 1897, and Annals of Botany, June, 1897). The slides showed the spermatozoids while still in the pollen-tube, before the commencement of active movement. In the case of *Ginkgo* one section showed the two male generative cells, closely contiguous and enclosed in the pollen-tube. The general structure resembles that in many other conifers at the same stage, *e.g. Juniperus virginiana* and *Pinus silvestris* (Strasburger, Hist. Beiträge, iv. pl. 2). In *Ginkgo*, however, each generative cell showed a distinct spiral coil, situated in each cell, on the side remote from its neighbour. Another preparation of *Ginkgo* showed a series of sections across the micropyle, passing through a pollen-tube and its generative cells, the plane of section being in this case approximately parallel to the surface of contact of these two cells, through which four of the sections passed. In the two terminal sections of this series the spiral coil was clearly shown, consisting of about three windings. The spiral is connected with the nucleus of the cell, but whether it is itself of nuclear or cytoplasmic origin is not certain. In the preparation from *Cycas revoluta*, several pairs of generative cells were shown; in some cases the pollen-tube enclosing them was intact. The spiral coils in some of the generative cells were surprisingly clear, consisting of about four windings. A distinct striation was visible in connection with the coil, probably indicating the presence of the numerous cilia described by the Japanese discoverers. The facts admit of no other interpretation than that given by these authors, namely that in both *Ginkgo* and *Cycas* each generative cell gives rise to a spiral spermatozoid; the latter by its own movements (actually observed by Dr. Hirase in the case of *Ginkgo*) no doubt travels from the end of the pollen-tube to the female cell. In a discussion which followed on this highly important subject, Dr. W. T. Thiselton Dyer, C.M.G., Mr. W. Carruthers, F.R.S., Prof. E. Ray Lankester, F.R.S., Prof. Howes, F.R.S., and the President took part.—Mr. T. B. Blow exhibited and described a curious case of protective mimicry in *Asparagus albus*, which drew forth criticism by Mr. H. Groves and the President.—Mr. J. E. Harting exhibited and made remarks upon specimens of *Nestor productus* and *Nestor norfolcensis*, from the Derby Museum, Liverpool, lent for exhibition by Dr. H. O. Forbes. The specimen of *Nestor norfolcensis* was of especial interest, from the remark of Count Salvadori (Brit. Mus. Cat. Parrots, xx. p. 10) that this bird is now extinct and is only known from Latham's description (Gen. Hist. Birds, 1822, ii. p. 171), and from the description and figure of the head published by von Pelzeln (Sitzb. k. Akad. Wiss., 1860, xli. p. 322) from a drawing by Ferdinand Bauer, who had visited Norfolk Island where the bird was found. With regard to *Nestor productus*, it appeared (1) that the species underwent a change of plumage analogous to that of the Crossbills: (2) that the description given by Latham applied to a more adult bird than that now shown; (3) that the result of a comparison of the two skins exhibited and the dimensions of the wings, tarsi, and feet, rendered it doubtful whether the two forms were specifically distinct, the slight variations observable in the colouration being such as might reasonably be attributed to age or sex.—Mr. Miller Christy read a paper on *Primula elatior*, Jacq., in Britain. He remarked that this widely-distributed continental plant, though figured accidentally in "English Botany" in 1799, was not really detected in Britain till 1842, to which time the totally distinct hybrid Oxlip (*P. acaulis* × *veris*) was, by British botanists, confused with, and mistaken for it, as is still frequently the case. In Britain, *P. elatior* occupies a sharply defined area, divided by the valley of the Cam, with only two outlying localities, so far as Mr. Christy could ascertain. This area covers the two most elevated and unbroken portions of the boulder clay district, the loams and gravels of the river-valleys and the chalk being entirely avoided. The boundary-lines (some 175 miles in length) which had been traced by Mr. Christy with precision were, in consequence, very sinuous. They enclosed together about 470 square miles, over which area the Oxlip flourishes in immense abundance in all old woods and some meadows; while the Primrose (which grows all around) is entirely absent. Along the dividing line between the two, which is very sharply defined, hybrids are produced in great abundance. On the other hand, the Cowslip (which grows both around and throughout the Oxlip area) very rarely hybridises with it. Mr. Christy believed that the Primrose was, in this country, gradually hybridising the Oxlip out of existence. He then noticed a rare single-flowered variety of *P. elatior*, which he proposed to call var. *acaulis*, and several aberrations, showing upon the screen photographic views of these and of the hybrids, as well as a map of the distribution of the Oxlip in Britain. In a discussion which followed, Mr. C. B. Clarke, F.R.S., and Sir John Lubbock, Bart., M.P., confirmed the accuracy of Mr. Christy's observations.—On behalf of Mr. A. D. Michael, the Zoological Secretary read a report on the *Acari* collected by Mr. H. Fisher, naturalist of the Jackson-Harmsworth Polar Expedition, at Cape Flora, Northbrooke Island, Franz Josef Archipelago, in 1896. The collection had been formed under great difficulties, and consisted of five species, two of which (*Erethræus Harmsworthi* and *Oribata Fisheri*) were regarded as new to science.—Sir John Lubbock, Bart., M.P., F.R.S., communicated the substance of a paper entitled "Further observations on Stipules," in continuation of a former paper communicated by him to the Society on March 18 last.

The present paper. which was illustrated by diagrams, has reference, *inter alia*, to the Ash, Hop, and two species of Pea (*Lathyrus grandiflora* and *L. pratensis*). Mr. W. Carruthers, F.R.S., in commenting upon this paper, expressed the satisfaction which he was sure would be felt by botanists at the way in which the author was carefully working out details in the life-history of British plants, and in that respect conforming to the spirit of the charter of the Society which expressly defined the object of its formation to be "the cultivation of the science of natural history in all its branches, and more especially of the natural history of Great Britain and Ireland."—Prof. Conway Macmillan, of the University of Minnesota, communicated the principal points of a paper on minor tension-lines between plant-formations.

PARIS.

Academy of Sciences, June 28.—M. A. Chatin in the chair.—The President announced to the Academy the loss it had sustained by the death of M. Schützenberger, Member of the Chemical Section.—On the integration of the equation $\Delta u = F(u, x, y)$, by M. Émile Picard.—On uniform quadruply periodic functions of two variables, by M. Émile Picard.—On the rotatory parts of the transversal components of the velocity in a permanent flow gradually varied, by M. J. Boussinesq.—M de Lapparent was nominated as Member in the Section of Mineralogy, in the place of the late M. Des Cloizeaux.—On psoriasis and its relations with syphilis, by M. F. Bouffé. The injection of orchitine appears to be specific as a cure for psoriasis. The latter frequently masks the symptoms of syphilis. In the cases cited, if the treatment had been sufficiently prolonged, there was no return of the disease.—On the treatment of cancer, and of several infectious diseases by ozone, by M. Charles Chardin.—On the causes of differences of quality in harmonic chords, by M. Bourcoud.—Observations on the sun, made at the Observatory of Lyons with the Brunner equatorial, during the first quarter of 1897, by M. J. Guillaume. A tabulated statement of observations on sun-spots and faculæ.—On the geodesic lines of oppositely curved surfaces, by M. Hadamard.—On the enumeration of primitive groups of which the degree is below 17, by M. J. A. Miller.—On the determination of the integrals of certain non-linear partial differential equations by their values on a closed surface, by M. E. Le Roy.—On the permanent deformations of metals, by M. G. A. Faurie.—Influence of the intensity upon the pitch of a sound, by M. André Broca. If the intensity of a sound decreases, the note goes up, even though the period of vibration remains the same. The effects are small, and in the experiments described amount to about $\frac{1}{3}$ of a tone.—Researches on nickel-steels. Magnetic properties and permanent deformations, by M. C. E. Guillaume. The effect of temperature upon the magnetic properties of the nickel-steels was first studied, and it was found that these alloys could be divided into two classes, those containing from 0 to 25 per cent of nickel, for which the effects produced by heat were irreversible, whilst in the second class, containing higher percentages of nickel, the effects were reversible. The permanent changes of length set up in these alloys are of the same order as those in the hard glass used in thermometers.—The sulpho-antimonites of silver, by M. Pouget. The salts KAg_2SbS_3 and Ag_3SbS_3 are described. K_2AgSbS_3 could not be prepared.—On the function of manganese in certain oxidations, by M. Ach. Livache. A discussion of the action of manganese salts in quick-drying oils.—The colour of the phosphorescence of strontium sulphide, by M. José Rodriguez Mourelo. The phosphorescence depends largely upon the nature of the impurities present, and hence upon the method of preparation. The sulphide produced by the action of sulphur upon strontianite at a red heat gives the finest green colour.—Observations on the molecular volumes of several crystallised carbohydrates at 0°, by M. Pionchon. An extension of an observation of Joule and Playfair to the effect that the molecular volumes of cane-sugar and milk-sugar were exactly equal to the volume occupied in the state of ice, of the water of which this mass contains the elements. The same relations hold approximately for xylose, glucose, levulose, mellitose and raffinose.—Trioxymethylene and paraformaldehyde, by M. Delépine. The heats of formation of trioxymethylene and paraformaldehyde from its elements were determined, and also the heat of solution of the former in water.—On some combinations of phenylhydrazine with metallic iodides, by M. J. Moitessier. The compounds $ZnI_2.2(C_6H_5.N_2H_3)$, $ZnI_2.5(C_6H_5.N_2H_3)$, $CdI_2.2(C_6H_5.N_2H_3)$, $MnI_2.2(C_6H_5.N_2H_3)$, and $NiI_2.6(C_6H_5.N_2H_3)$ are described.—On the combination of metallic salts with organic bases homologous with aniline and their isomers, by M. D. Tombeck.—On the action of acetylene on silver nitrate, by M. G. Arth.—On the tetrameric regeneration of the tarsus of the Phasmidia, by M. Edmond Bordage.—The *N'djembo* the caoutchouc plant of Fernan-Vaz, by M. Henri Jumelle. The plant is described and named *Landolphia Foreti*. It is distinguished from *Landolphia owariensis*, among other points, by the superior quality of the caoutchouc produced from it.—A new remedy against mildew and black rot, by M. Gaston Lavergne. The mixture proposed consists of copper sulphate (500 gr.), black soap (1000 gr.), and water (100 litres).—Observation on a French meteorite, the fall of which (at Clohars in 1822) was unnoticed, by M. Stanislas Meunier.—The nerves of the heart and thyroid gland, by M. E. de Cyon.—Researches on the ostioles of the mucous membranes, by M. J. J. Andeer.—Effects of a hailstorm, by M. A. Forel. This hailstorm of June 2, at Morges, was remarkable for the duration of the fall of hail, more than ten minutes; the great electrical disturbances, the lightning being almost continuous; the magnitude of the hailstones, 5 to 6 cm. in length; and the peculiar structure of some of the pieces of ice.

BOOK, PAMPHLETS, and SERIALS RECEIVED.

BOOK.—The Chlorination Process: E. B. Wilson (Chapman).

PAMPHLETS.—Hints to Meteorological Observers: W. Marriott, 4th edition (Stanford).—The Fallacy of Marx's Theory of Surplus Value: H. Seymour (Murdoch).

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