

do not exceed £30 a year. In the case of scholars proceeding to the old universities a contribution of £30 per annum is made by the Board towards the college and university tuition fees. Candidates must be resident within the administrative County of London, and must send in applications to the Secretary of the Board, at 13 Spring Gardens, on or before Monday, June 29, on forms which can be obtained on application. Last year the Board awarded several exhibitions of smaller value to specially deserving candidates in addition to appointing five County Scholars. Hitherto the selection of the scholars has been based upon the record of their past achievements and testimonials received from their teachers or others qualified to judge of their capabilities. These scholarships are restricted to candidates whose parents are in receipt of not more than £400 per annum.

THE Hartley Institution at Southampton has not developed so much as it might have done since it was established, owing to a divided management and limited finances, but it has now entered upon a brighter part of its career, and we confidently expect to learn of rapid and vigorous growth in the near future. The Secretary of the Institution has retired on a pension, and the Town Council of Southampton have decided to grant a farthing rate for one year to the Hartley Council. The action of the Borough Council in giving rate aid in support of technical and scientific education, in addition to the whole of the residue under the Customs and Excise Act, shows that the friends of educational advancement upon the Council are strong enough to make headway in spite of contrary breezes. Dr. R. W. Stewart, the Principal, is now free to develop his well-laid schemes for extending and improving the work of the Hartley Institution, and there is every reason for believing that under his whole management, and with the increased resources now available, the Institution will extend in the right direction, while at the same time the position of Southampton as an educational centre will be advanced. The objects of the proposed reorganisation are, first, the extension of the evening technical classes, and, second, a complete change in the work of the day classes. The extension of the evening classes will take place mainly in improving and extending the trade and commercial classes, and in providing classes for teachers. It was to make these changes that a farthing rate was solicited. The help was asked not to relieve the Hartley Council of any present financial embarrassment, but to enable them to carry out a scheme of educational reform which must ultimately be of the greatest benefit to the town and neighbourhood. A few of the reasons which showed the necessity for reorganising the educational work of the Institution may be specified. The Institution is already provided with buildings, and during the last five years the accommodation and equipment had been greatly improved by the provision of new lecture-rooms, a chemical laboratory, a physical laboratory, and engineering and other workshops. All this would be practically wasted and lost to the town unless supplemented by the appointment of a properly qualified teaching staff, able to utilise and develop the resources of the Institution to the utmost. The income of the Institution—about £2750—was not quite enough to meet the general working expenses and to provide a staff of this kind; but with the grant now made by the Town Council a much more efficient return will be obtained. The development of the Institution on the lines suggested will enable students to obtain an education of university rank, and to proceed to a degree in arts, or science, or law, at the University of London, by attending a three years' course at the day classes of the Institution in their own town. Lecturers are to be appointed in mathematics, biology and geology, English and classics, French and German, at a salary of £150 per annum each. This is something for Southampton to be proud of, and we trust that the policy which has inaugurated the new epoch in the educational history of the town will permanently represent the feeling of the Borough Council.

SCIENTIFIC SERIALS.

American Journal of Science, June.—On the colour relations of atoms, ions, and molecules, by M. Carey Lea. Part II. If a coloured substance be formed by the union of a colourless kation with a colourless anion, the colour belongs to the molecule only. Consequently, if we find a solvent which, like water, is capable of separating the ions, the resultant solution when dilute must be colourless, no matter how intense the colour of the com-

pound. Experiments confirm this law without exception. Antimony pentasulphide, a strongly coloured compound, is a case in point. When dissolved in an alkaline sulphide, the ions of antimony and sulphur, themselves colourless, separate sufficiently to no longer change each other's vibration periods. They still, however, remain within the sphere of mutual influence. The union of coloured and colourless ions gives rise to the most surprising changes of colour. Two similar coloured ions may unite to form a colourless element. Two similar colourless ions may unite to form a strongly-coloured element. No black ion is known. There is absolutely no relation traceable between the colour of an ion and that of the element which it aids to form.—The gravimetric determination of selenium, by A. W. Peirce. The usual method used in the gravimetric determination of selenious acid, that of precipitating the selenium with sulphurous acid in presence of hydrochloric acid, is slow and incomplete. The author substitutes potassium iodide for the sulphurous acid. To avoid obtaining the selenium in the pasty condition when large quantities are present, the potassium iodide should be considerably in excess of the amount necessary for precipitation.—The extinct *Felida* of North America, by G. I. Adams. This is an attempt to give a general account of this family, to summarise the literature on the subject, and to work out a comprehensive classification. The paper is accompanied by three admirable plates.—The age of the igneous rocks of the Yellowstone National Park, by Arnold Hague. The pouring out of igneous rocks began with the post-Laramie uplift, or closely followed it, and from the time of the first appearance of these rocks, volcanic eruptions continued throughout Tertiary time.—Researches on the Röntgen rays, by Alfred M. Mayer. Herapathite, an iodosulphate of quinine, the most powerfully polarising substance known, is incapable of polarising X-rays. The actinic effect of X-rays varies inversely as the square of the distance of the sensitive plate from the radiant source.—On the *Pithecanthropus erectus*, from the Tertiary of Java, by O. C. Marsh. It may be taken as established that the remains of this "missing link" at present known are of Pliocene age. The tooth, skull, and femur found belonged to the same individual. This individual was not human, but represented a form intermediate between man and the higher apes.

Wiedemann's Annalen der Physik und Chemie, No. 5.—Anomalous electric dispersion of liquids, by P. Drude. Short electric waves (of 70 cm. wave-length in air) are more strongly damped in alcohol, and especially in glycerine, than in water or in aqueous solutions. Theoretically, the damping should increase with the conductivity. But these badly conducting bodies are found to damp electric waves as effectually as a 5 per cent. solution of copper sulphate, which is 6000 times more conducting. This is not the only anomaly exhibited by ethyl and amyl alcohol, glycerine, and acetic acid. They also show anomalous dispersion for rapid electric oscillations, *i.e.* a decrease of the electric index of refraction with increasing frequency. Further, the specific inductive capacities are greater than the squares of the electric indices of refraction. Water, methyl alcohol, and benzol show no such anomalies, and ether only shows anomalous absorption.—Thermo-couples of amalgams and electrolytes, by A. Hagenbach. These were prepared by connecting two beakers filled with an amalgam by means of an M-shaped siphon filled with an aqueous solution of a salt of the same metal, the ends of the siphon being closed by a membrane. The amalgams were enclosed in water baths, and could be heated simultaneously or alternately. The only metals suitable for accurate measurements were cadmium and lead. Theory demands that as the salt solutions are diluted the thermo-electric forces shall increase. This law was found to fail with the divalent elements named. A couple, consisting of cadmium amalgam and cadmium chloride or nitrate, showed a steady diminution of the thermo-electric force as dilution increased from 0.1 to 0.0001 of the normal.—Contributions to the knowledge of fluorescence, by G. C. Schmidt. The author maintains that all bodies are capable of fluorescence if dissolved in suitable solvents. The most favourable form in which a substance may occur is that of a "solid solution." Aniline dyes may be made to fluoresce by solution in sugar, gelatine, hippuric acid, quinine bisulphate, and other substances. The colour of fluorescence is often nearly independent of the solvent.—Theoretical investigations concerning light, by P. Glan. The author calculates the absorption of various substances for a certain kind of ultra-violet light from their thermal conductivities and refractive indices, and shows that muscle, horn, wood, bone, cork, paper,

ebonite, shellac, lampblack, water, and carbon bisulphide must behave towards these rays in the same manner as they have been found to behave towards Röntgen rays.—A new form of mercurial air-pump, and the preservation of the vacuum in Röntgen tubes, by R. W. Wood. The author describes a simple pump consisting of a system of tubes and bulbs containing the vacuum tube in one branch. It is completely closed, and the vacuum is restored at will by simply oscillating the whole apparatus.

Bulletin de la Société des Naturalistes de Moscou, 1895, No. 2.—Contributions to the knowledge of the molecular forces, as a foundation to thermodynamics, by J. Weinberg; fourth part, dealing with capillarity and adhesion.—The development of the occipital region of the lower vertebrates, in connection with the question of metamery of the head, by A. Sewertsoff. An elaborate and suggestive work, in German, with two plates.—On the rotation of the earth, supposed to be fluid in its interior, by Th. Sloudsky, in French.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 4.—“Observations on Atmospheric Electricity at the Kew Observatory.” By Dr. C. Chree.

The primary object of the investigation was to arrive at a more exact interpretation of the records obtained with the Kew electrograph, and to devise improvements in the conditions under which it works. The electrograph curves are intended to give the value of the potential at the point in the air where a water jet issuing from a long pipe breaks into drops. The proximity of a tall building has naturally, however, a large influence on the potential, so that no direct estimate could be made of the true potential gradient, *i.e.* the increase in potential per unit of height in the open.

Some preliminary experiments were made, which may be regarded as verifying Prof. Exner's experimental conclusion that a building under normal conditions reduces the potential in its neighbourhood, as if it formed an integral part of the earth's surface. Subsequently four series of observations were made. The respective seasons were November–December, 1894, March–April, June–July, and October–November, 1895. The observations were taken with a portable electrometer of known scale value, at one or two approximately constant hours, at five or six stations on or near the Observatory.

The results were consistent with the view that such general phenomena as diurnal or annual variation of potential got out with the same instrument at the several stations would show a good agreement.

A comparison was also made between the potentials deduced from the electrograph curves and the readings of the portable electrometer.

The values of the several meteorological elements, at the times of the observations with the portable electrometer, were derived from the Observatory records.

They afforded the opportunity of carrying out a searching investigation into possible connections of the several meteorological elements and the potential gradient. Attention was particularly directed to data bearing on Exner's theory, which connects potential gradient with density of aqueous vapour through a definite formula, departures from which are to be regarded as abnormal and due to disturbing causes. Special attention was also devoted to the possible influence of bright sunshine in reducing the potential gradient, in consequence of the theory proposed by Elster and Geitel.

The results of the investigation seem far from favourable to Exner's hypothesis. They afford a certain amount of general support to Elster and Geitel's theory, inasmuch as on an average potential seemed lower after long previous sunshine. The evidence, however, in favour of a connection between high potential and low temperature, high barometric pressure, low wind velocity, and anti-cyclonic conditions generally, seems about equally strong with that in favour of Elster and Geitel's theory. In each case notable exceptions appeared to any general rule.

Chemical Society, May 28.—Mr. A. G. V. Harcourt, President, in the chair.—Prof. P. P. Bedson delivered the Lothar Meyer Memorial Lecture. The lecturer reviewed Meyer's contributions to our knowledge of the gases contained

in the blood and of the periodic law, and gave an account of the work done by the late German chemist towards promoting the systematic arrangement of inorganic chemistry, pointing out how great had been Meyer's influence on the promotion and advancement of chemical theory during the past thirty years.

June 4.—Mr. A. G. V. Harcourt, President, in the chair.—It was announced that an address is to be presented to Prof. Cannizzaro on the occasion of his seventieth birthday in July next; an address is also being presented to Lord Kelvin on the completion of his fiftieth year as Professor of Natural Philosophy in Glasgow University. The following papers were read:—On magnetic rotatory power, especially of aromatic compounds, by W. H. Perkin. The author describes apparatus used for determining magnetic rotations, and having determined the influence of temperature and dissolution on this property, gives the results of the examination of a large number of compounds of different types. Great differences exist between the magnetic rotations of aromatic and fatty compounds, the nuclei contained in a substance considerably influencing its rotation; frequently the compounds behave as composite molecules, the fatty and cyclic part separately influencing the magnetic rotation; the presence of a carbonyl group connecting the nuclear and fatty groups seems to act as a screen, preventing them from influencing each other. The influence of the nucleus on the rotation is reduced by the presence of electro-negative groups, and increased by that of electro-positive ones; this great liability of the magnetic rotation of the nucleus to change, is connected with the fact of its unsaturatedness, for saturated cyclic compounds behave like ordinary open chains. The so-called values given for atomic refractions or magnetic rotations are not true physical constants, but are merely the average influences which elements or radicles exert in different compounds; this, however, does not detract from their usefulness in determining constitution.—Mononitroguaiacol, by R. Meldola. One mononitro-derivative, probably the para-compound, is obtained by nitrating acetylguaiacol; benzoylguaiacol yields two mononitro-derivatives, probably the ortho- and para-, on nitration. Mononitroguaiacol may be prepared by hydrolysing its acetyl-derivative.

Linnean Society, June 4.—Anniversary Meeting.—Mr. C. B. Clarke, F.R.S., President, in the chair.—The Gold Medal of the Society was formally awarded to Prof. G. J. Allman, F.R.S., for distinguished researches in zoology, and, in consequence of his inability to receive it in person, was delivered on his behalf to Sir Joseph D. Hooker, K.C.S.I., who made a suitable acknowledgment. The Treasurer then presented his annual statement of accounts. The Secretary reported the deaths, withdrawals, and elections during the past year. The report of the Librarian having been read, the President opened the chief business of the evening, 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 retiring President, Mr. C. B. Clarke, then delivered the annual presidential address, which on the motion of Mr. W. Carruthers, seconded by Mr. W. P. Hiern, it was resolved should be printed and circulated.

Mathematical Society, June 11.—Major MacMahon, R.A., F.R.S., President in the chair.—The Chairman announced that the Council had awarded the De Morgan Memorial Medal to Mr. S. Roberts, F.R.S. He also read an address which the Council had requested him to present to Lord Kelvin on the occasion of the jubilee celebration on the 16th instant. The address, which was illuminated, was placed for inspection on the table. The following communications were made:—Waves in canals, by H. M. Macdonald; on the *a, b, c* form of the binary quintic, by J. Hammond; construction for the four normals to a central conic drawn through a given point, by Prof. Mathews; on a two-fold generalisation of Stieltjes' theorem, by Dr. Taber; notes on magic squares, by Rev. A. H. Frost.

Entomological Society, June 3.—Dr. D. Sharp, F.R.S., Vice-President, in the chair.—Mr. Gervase F. Mathew exhibited the new species of *Leucania*, *L. flavicolor*, recently described by Mr. Barrett (*Ent. Monthly Mag.*, 2nd series, vol. vii. p. 99), and also the varieties of *L. pallens* noticed by Mr. Barrett in the same article (*l. c.*, p. 100). Mr. Tutt having carefully examined the specimens of *Leucania flavicolor*, said that he considered it