

appointed chairman of the examiners for the natural sciences tripos, 1907.

DR. H. E. ANNETT has been elected to the newly-established chair of comparative pathology in the University of Liverpool.

THE second award of the Vulcan fellowship in engineering of the Victoria University of Manchester will be made this session. Applications should be made to the registrar on or before December 10. The fellowship, which is of the annual value of 120*l.*, offers exceptional opportunities for research in engineering. It is tenable for one year, but may be renewed for a second, and in special circumstances for a third, year.

THE *Times* states that the trustees of the late Mr. T. Graham Young have presented to the governors of the Glasgow and West of Scotland Technical College a sum of 10,000*l.* to assist in making provision for the teaching of dyeing and bleaching in connection with the chair of technical chemistry in the college. Mr. Young's trustees have also voted a sum of 850*l.* for the equipment of the laboratory for the chair.

THE regulations for admission to the schools of mines at Clausthal and Berlin, and to the mining and metallurgical department of the Aachen Technical School, have been brought into unison. Hitherto, at Clausthal and Berlin, on matriculation twelve months' practical experience was demanded, whilst at Aachen no previous practical training was required. Moreover, at Aachen the length of the course was three years, whilst at Clausthal and Berlin it was four years. Henceforth no practical experience will be demanded for entry at Clausthal and Berlin, but on entering for the first examination students will be required to furnish evidence of six months' practical work. At Aachen the course will in future cover four years.

THE London County Council has decided to expend 37,500*l.* in acquiring sites for secondary-school and training-college purposes in the districts of Clapham, Wandsworth, North London, and Tooting. The schools are needed for the scholars elected under the council's new scholarship scheme. It is proposed to erect six schools on the sites, three for boys and three for girls, and to adapt as a training college a mansion at present standing on one of the sites. The cost of erecting the six schools will be about 160,000*l.*, and that of adapting the mansion 8000*l.* It is anticipated that four more schools will be needed to provide for the full number contemplated by the scholarship scheme. The total expenditure upon the council's proposals with regard to secondary schools is estimated at 575,000*l.*

A MOVEMENT has been started for the reconstitution of Queen's College, Cork, and its conversion into a university centre for Munster. Speaking at a meeting convened on Saturday last by the Lord Mayor of Cork and Mr. McDonald, chairman of the County Council, Mr. William O'Brien, M.P., said it is proposed to do in Cork what has been done in Birmingham. The institution to be set up will be purely democratic. It will belong to the people, and will be governed by the people's representatives. The governing purpose of the university will be to open up a career in life to every gifted child in the province. Mr. O'Brien and his wife have decided to bequeath on their demise practically all their property as a contribution towards the endowment of a Cork University. Mr. O'Brien said it should be possible to arrange, if the borough and county councils of the province are willing to assume a temporary burden, which will be an exceedingly slight one, and every shilling of which will be repaid at his and his wife's death, that a sum of 50,000*l.* can be at once made available.

THE recently published annual report on the work of the Glasgow and West of Scotland Technical College supplies as an appendix a report on a visit to American educational institutions, presented to the governors by Mr. H. F. Stockdale, the secretary and director of the college. The subject of the director's inquiry was especially the equipment of the engineering schools visited, with a view to the economical and judicious expenditure of the grants

made to the engineering departments of the Glasgow college. Mr. Stockdale insists that the only points where the superiority of American schools must be admitted are those in which the weight of money turns the scale. The laboratory equipments are generally far more extensive and include more costly apparatus than is within the means of most British colleges. The environment of certain American institutions, such as that of the University of Wisconsin and of Cornell University, is, too, a great advantage. The director was much impressed by the facilities in the States for the study of railway mechanical engineering, and he points out that this seems to be a field in which the Glasgow college might do good work. An Englishman in charge of a section of the metallurgical department of Columbia University alleged that many British students proceed to the States to study metallurgy. Like other British visitors to America, the Scottish director saw and heard with envy the large number of able men on the staff in nearly all the best colleges in the States, and noted that the heads of departments are allowed plenty of time for research. The circumstance that the large staffs make it possible for professors to engage in outside professional practice, to the advantage of the work of their colleges, is also commented upon. Mr. Stockdale has written a very useful report, which will repay attention from educational authorities.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, November 1.—Prof. R. Meldola, F.R.S., president, in the chair.—A development of the atomic theory, which correlates chemical and crystalline structure and leads to a demonstration of the nature of valency: W. Barlow and W. J. Pope. The authors represent atoms in the combined state by "spheres of influence." An examination of the geometrical properties of closely-packed assemblages of spheres shows that the atoms of the elements must be represented by spheres of influence directly proportional in volume to their fundamental valencies, and that a closely-packed assemblage built up of spheres of the appropriate sizes, so as to represent some particular compound, can be partitioned into units identical with the chemical molecule, and possesses symmetry and dimensions compatible with those of the crystalline substance. In addition, it is shown that close-packed homogeneous assemblages of spheres possess other properties which lead to simple interpretations of multivalency and tautomerism, and that ethylenic and acetylenic bonds and isomerism have complete analogues in peculiarities of homogeneous assemblages of spheres.—Synthesis of carvestrene. Preliminary notice: W. H. Perkin, jun., and G. Tattersall.—Some derivatives of catechol, pyrogallol, benzophenone, and of some substances allied to the natural colouring matters: W. H. Perkin, jun., and C. Weizmann. This communication contains descriptions of the preparation and properties of a number of new substances obtained at different times in connection with researches on the constitution of brazilin, hæmatoxylin, and other natural colouring matters.—Experiments on the synthesis of the terpenes, part ix., the preparation of cyclopentanone-4-carboxylic acid and of cyclohexanone-4-carboxylic acid (8-ketohexahydrobenzoic acid): F. W. Kay and W. H. Perkin, jun.—The hydrolysis of "nitrocellulose" and "nitroglycerine": O. Silberrad and R. C. Farmer. The hydrolysis is complicated by the simultaneous reduction of the nitric acid, and intermediate products are formed, which are gradually acted upon by the alkali; these are practically insoluble in water and do not give rise to free acid when left in contact with water for several days.—The acidic constants of some ureides and uric acid derivatives: J. K. Wood. In compounds which contain the grouping .CO.NH.CO.NH.CO., there appears to be a mutual reinforcement of the imino-groups by the carbonyl groups present analogous to that exhibited by the carbonyl groups in succinic acid.—The affinity constants of xanthine and its methyl derivatives: J. K. Wood. The results of determinations of the basic and acidic constants of xanthine, 7-methylxanthine, the three isomeric dimethylxanthines, and caffeine are described.—The explosive com-

bustion of hydrocarbons, ii. : W. A. **Bone**, J. **Drugman**, and G. W. **Andrew**. The "inflammation" of mixtures of ethane or ethylene and oxygen has been studied. In each case, steam, aldehydes, ethylene, and acetylene are prominent during the initial stages of combustion, whilst carbon is a later product.—Contributions to the theory of solutions, i., the nature of the molecular arrangement in aqueous mixtures of the lower alcohols and acids of the paraffin series; ii., molecular complexity in the liquid state; iii., theory of the intermiscibility of liquids: J. **Holmes**.—The relation between natural and synthetical glyceryl-phosphoric acids, part ii. : F. **Tutin** and A. C. O. **Hann**. It is concluded from the results obtained that the natural and synthetical glyceryl-phosphoric acids are differently constituted mixtures of the α and β acids.—Thiocarbonic acid and some of its salts: Miss I. G. **O'Donoghue** and Miss Z. **Kahan**. The acid has the formula H_2CS_3 . The salts are very unstable even in a vacuum.—Studies in optical superposition, part ii. : T. S. **Patterson** and J. **Kaye**. The optical properties of di-*l*-menthyl-*l*-tartrate, di-*l*-menthyl diacetyl-*l*-tartrate, and sodium *l*-menthyl *l*-tartrate have been examined.—Optically active dihydrophthalic acid: A. **Neville**. When the hydrogen strychnine salt of *trans*- Δ^3 : Δ^2 -dihydrophthalic acid is fractionally crystallised from alcohol, the acid is resolved into its *laevo*- and *dextro*-isomerides, which are described.

Entomological Society, November 7.—Mr. F. Merrifield, president, in the chair.—**Exhibitions.**—H. J. **Lucas**: Photograph of *Panorpa germanica*, practically immaculate, from Sutherlandshire, and a typical form for comparison, corresponding apparently to the *borealis* of Stephens. Also a series of the genus to illustrate the range of spotting on the wings of both sexes.—G. C. **Champion**: A long series of a *Henicopus* (probably *H. spiniger*, Duval), from El Barco, Galicia, Spain, to demonstrate the dimorphism of the females.—H. St. J. **Donisthorpe**: Seven specimens of *Prionocyphon serricornis*, Müll., bred from larvæ taken in the New Forest in July, live larvæ, and a larva and pupa, figured, of the same, with a note on the species.—Dr. T. A. **Chapman**: (1) A collection of butterflies, made in Galicia (lat. $42^\circ 16'$ N., long. $6^\circ 44'$ W.) last July, including *Lycaena idas*, hitherto reported only from the Sierra Nevada, in the south-east of Spain. (2) *L. argus* (*aegon*) from the same district, which, though very close to the vars. *hypochiona* and *bejarensis*, differed in a certain proportion of the specimens presenting the red of the marginal "peacock eyes" on the upper surface of the hind wings of the males.—Hon. N. C. **Rothschild**: Branches of *Viburnum lantana* showing the mines of *Sesia andreniformis*, now discovered as the food-plant of the species in Britain for the first time.—E. D. **Jones**: Two species of the genus *Mollipa* bred from Brazilian larvæ which were identical in form; also photographs of the larvæ *in situ*.—Dr. F. A. **Dixey**: A case of female Pierine butterflies to illustrate various conditions under which white pigment might be replaced by black. He said that though melanism may occur as a sport, it owed its establishment to the principle of selective adaptation.—The **President**, mentioning a bug which Mr. Cecil Floersheim had found very destructive to the eggs of *Papilio machaon* and *P. asterias*, said that it was remarkable to find one of the *Heterotoma* as a carnivorous species.

Faraday Society, November 13.—Dr. F. Mollw Perkin, treasurer, in the chair.—Some investigations relative to the depreciation of electrolytically produced solutions of sodium hypochlorite: W. P. **Digby**. This deals, in the first place, with depreciation taking place in bottles of various colours, in which dark amber bottles gave the best results, the loss in 1817 days being about 40 per cent. for a solution containing 4.216 grms. of available chlorine per litre. The corrosive action of hypochlorite solutions upon various metals is then discussed, and the depreciations due to graphite, copper, zinc, lead, and iron plates immersed in such solutions are set forth for a period of 480 hours. A much greater depreciation takes place, due to galvanic action, when two dissimilar metals immersed in the liquid are connected by an insulated wire; the paper gives records in the case of twenty-one different couples. When iron is present as one metal in such a couple, the depreciations are generally greater than for any two other metals.—The Hermite electrolytic process at Poplar: C. V. **Biggs**.

This paper is a contribution to the data at present available on the subject of the electrolytic productions of hypochlorites. It consists of a description of the plant in use at Poplar for the preparation of a solution containing about 4.5 grms. of available chlorine per litre, for use as a disinfectant in the borough. The author concludes that the magnesium hypochlorite, as made at Poplar, is sufficiently stable for practical purposes, and that it could be made in a warm climate without necessarily rapid deterioration.—The electrochemistry of lead: Dr. A. C. C. **Cumming**.

CAMBRIDGE.

Philosophical Society, October 29.—Dr. Fenton, vice-president, in the chair.—The procession of *Cnethocampa pinivorax*: H. H. **Brindley**. The processionary larva of this moth, one of the Eupterotidæ, which is common in the *Pinus maritima* districts of the Landes, marches in single file both in its nocturnal excursions from its nest in the pine to feed on the young leaves and also in the journey from the nest tree to pupate in the sand. The primitive spins a thread which is added to by the satellites in succession. Fabre ("Souvenirs entomologiques," ser. vi.) describes many observations made in his laboratory near Avignon with imported families. The author found a procession of 114 larvæ in the Cap Ferret Woods, Arcachon, on April 2, in the final procession for pupation. Interruptions and rearrangements of the procession were made with results in the main in accord with Fabre's account, but in spite of much contact with bare hands the irritation from the poison hairs, found by Fabre to be at a maximum in this stage, was not noticed. Also the number of contiguous individuals removed was found to affect the mode of re-forming the procession. The procession was being attacked by a Tachinid fly, probably *Dexodes machairopsis*, endeavouring to lay eggs in the larvæ, and these seemed afraid of the hairs, though one fly ran over the back of a larva and lanced it near the hind end. As a rule, a fly propped itself on the edges of its wings and faced the larva, pushing it with its legs as it passed, and apparently trying to insert its ovipositor ventrally between the propodia. Failures to insert the eggs seemed very numerous. The larvæ evidently felt the lancing acutely, always starting violently when it succeeded. The intention to burrow seemed very little interfered with by interrupting the chain; daughter chains started in different directions, the primitive soon burrowing in the nearest depression and disappearing in ten to fifteen minutes, while the satellites quickly followed his example. The complete procession, and the daughter ones made by interference, seemed to march towards the greatest sunlight.—A note on a collection of Oribatidæ from British Guiana: C. **Warburton** and N. D. F. **Pearce**. Our knowledge of such microscopic land animals as the Oribatidæ rests almost entirely on European and North American forms, because it is impracticable on scientific expeditions to collect individually creatures so minute. It has been found, however, that moss or other material in which the mites live, if packed in air-tight (preferably soldered) tins, reach England from the most distant countries in such a satisfactory condition that the animals in it may be examined alive. Some received in this way from British Guiana last June yielded a result which strikingly illustrates the importance of this method of collection. About forty species new to science were found in it—a fact the more remarkable in that the total number of satisfactorily established species of Oribatidæ previously known did not exceed 250. Some of the new forms are extremely interesting, and will certainly necessitate a revision of the existing genera.—The influence of spectral colours on the sporulation of various species of *Saccharomyces*: J. E. **Purvis** and G. R. **Warwick**. The light of a strong lamp was filtered through various coloured screens and played upon the surfaces of several species of pure cultures of *Saccharomyces* in an incubator at a definite temperature of 24° C. to 25° C. The results were compared with the effect of ordinary white light from the same lamp and also when the yeasts were allowed to sporulate in the dark, but at the same temperature as the yeasts sporulating under the influence of the spectral colours of red, green, blue, and violet. The conclusions were (1) red rays appeared to accelerate the formation of spores more quickly than white light; (2) the green rays retarded the development of the spores; (3) the blue and violet rays retarded

the development more than the green rays; (4) the violet and ultra-violet rays were still more effective, and they appeared to break down and disintegrate the vitality of the cells when the latter were kept for some time under their influence.

PARIS.

Academy of Sciences, November 12.—M. H. Poincaré in the chair.—Observations relating to equilibrium and reciprocal displacements between glycerol and other alcohols: M. **Berthelot**. The author refers to his experiments made between 1853 and 1862, and doubts the utility of the introduction of the words hydrolysis and alcoholysis.—A new and rapid method for the determination of the errors of division of a meridian circle: M. **Loewy**. A mathematical development of the method described in previous papers.—Some products of the fumerolles of the recent eruption of Vesuvius, with particular reference to the minerals containing arsenic and lead: A. **Lacroix**. The most abundant solid products of the fumerolles are those commonly found in all eruptions of Vesuvius, chlorides of iron, sodium, potassium, magnesium, and calcium, none of them well characterised from a mineralogical point of view with the exception of erythrosiderite. These chlorides are covered locally with realgar. The presence of galena has also been noted, the first time this mineral has been associated with the products of eruption of Vesuvius. Accompanying the galena were found magnetite, magnesioferrite, hæmatite, pyrrhotite, and pyrites.—Contribution to the study of the calorific emission of the sun: C. **Féry** and G. **Milochau**. A discussion of the results obtained by methods described in earlier papers. The measurements showed that there exists a distinct radiation outside the sun's disc, partly due to the dimensions of the thermocouple, but partly also to a calorific emission external to the solar image. On the assumption that the sun's nucleus acts as a black body, an attempt is made to correct the observed values for the absorption due to the solar atmosphere; the temperature obtained in this way lies between 5963° and 5888° absolute. The absolute error in the determination of a temperature in the neighbourhood of 6000° abs. is estimated to be of the order of 15°.—The photographic study of the telluric lines in the infra-red spectrum: Milan **Stefánik**. A description of observations carried out at the summit of Mt. Blanc. A comparison of two spectra obtained with a grating, one about noon and the other at 6 p.m.—Observations of the sun made at the Observatory of Lyons during the third quarter of 1906: J. **Guillaume**. The results are exhibited in three tables, showing the number of spots, their distribution in latitude, and the distribution of the faculæ in latitude.—Groups of functions: Frédéric **Riesz**.—Differential equations of the second order and of the first degree the general integral of which is at fixed critical points: M. **Gambier**.—The relative value of standards of light: Carcel, Hefner, and Vernon Harcourt: A. **Perot** and M. **Laporte**. Taking the Harcourt lamp as unity, the Carcel is 0.096 and the Hefner 0.0931. The experiments brought out the difficulties inherent to the use of flame standards, and show the necessity of having an absolute standard as independent as possible of external conditions, such as the Violle standard.—The reduction of molybdic acid in solution by molybdenum, and the titration of reducing solutions by permanganate: M. **Guichard**. The brown solution obtained by the reduction of an acid solution of molybdic acid by molybdenum contains, not a salt of the dioxide, but a salt of the oxide Mo₂O₅. The conclusion is drawn that the dioxide of molybdenum does not form salts. The use of iron reduced from the pure oxide is recommended for standardising permanganate solutions.—The heat of combustion and of formation of some amines: P. **Lemoult**.—Xanthone and xanthidrol: R. **Fosse**. It is known that xanthone, although containing a ketonic oxygen, does not form directly a phenylhydrazone or an oxime. The reduction product of xanthone, xanthidrol, on the other hand, reacts directly with hydroxylamine and with semicarbazide.—The condensation of *o*- and *p*-nitro-benzyl chloride with acetylacetone: H. **Mech**.—The existence in Corsica of alkaline quartz porphyry, and a remarkable layer of orthose: M. **Deprat**.—The reproduction of the fig: Leclerc **du Sablon**.—The motor equivalent of resistant work in animal energetics: Jules **Lefèvre**.

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DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 22.

ROYAL SOCIETY, at 4.30.—Studies on the Development of Larval Nephridia, Part ii., Polygordius: Dr. Cresswell Shearer.—The Structure of Nerve Fibres: Prof. J. S. Macdonald.—On Oponins in Relation to Red Blood Cells: Dr. J. O. Wakelin Barratt.—On the Inheritance of Certain Invisible Characters in Peas: R. H. Lock.—The Influence of Increased Barometric Pressure on Man, No. 2: Leonard Hill, F.R.S., and M. G. Greenwood.—The Influence of the Kidneys on Metabolism: Dr. F. A. Bainbridge and Dr. A. P. Beddard.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Selection and Testing of Materials for Construction of Electric Machinery: Prof. J. Epstein.

FRIDAY, NOVEMBER 23.

PHYSICAL SOCIETY, at 5.—On the Electrical Radiation from Bent Antennæ: Prof. J. A. Fleming.—Auroral and Sun-spot Frequencies contrasted: Dr. C. Chree.—The Electrical Resistance of Alloys: Dr. R. S. Willows.

SATURDAY, NOVEMBER 24.

ESSEX FIELD CLUB (at Essex Museum of Natural History, Stratford), at 6.30.—Report of Club's Delegate at York Meeting of British Association: F. W. Rudler.—Various Exhibits from Essex.

MONDAY, NOVEMBER 26.

SOCIETY OF ARTS, at 8.—Artificial Fertilisers; and the Fixation of Nitrogen: A. D. Hall.

LONDON INSTITUTION, at 5.—Egypt, Past and Present: Raymond Blathwayt.

INSTITUTE OF ACTUARIES, at 5.—Inaugural Address by the President, F. B. Wyatt.

TUESDAY, NOVEMBER 27

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Talla Water-supply of the Edinburgh and District Waterworks: W. A. P. Tait.—Repairing a Limestone-concrete Aqueduct: M. Ratcliffe Barnett.—The Yield of Catchment-areas: E. P. Hill.

ZOOLOGICAL SOCIETY, at 8.30.

WEDNESDAY, NOVEMBER 28.

SOCIETY OF ARTS, at 8.—Patent Law Reform: J. W. Gordon.

FRIDAY, NOVEMBER 30.

ROYAL SOCIETY, at 4.—Anniversary Meeting.
INSTITUTION OF CIVIL ENGINEERS, at 8.—Applications of Electricity in Printing-works: P. A. Spalding.
INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Steam as a Motive Power for Public Service Vehicles (Discussion): T. Clarkson.

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