Elements." As the result of the determination of the molecular weights of fifty to sixty halogen containing substances of different types, it was shown that molecular association occurs only when the halogen compound is an electrolyte, that there is no special virtue in the halogen elements—such as the existence of a large number of contra or residual valencies—neither is there any virtue in the halogen ion differentiating it from other ions. Molecular association in neutral solvents is the reverse of the supposed electrolytic dissociation in the dissociating solvents.

The third paper, by W. E. S. Turner and E. W. Merry, dealt with the molecular complexity of nitrosoamines. Measurements of the surface energy of three nitrosoamines show that aliphatic nitrosoamines are associated liquids, whilst aromatic nitriles and nitro-compounds are non-associated.

Dr. F. M. Perkin communicated a short note on the action of metals upon alcohols. When ozone is bubbled through lead suspended in a state of fine division in alcohol lead ethoxide is formed, and this substance is readily obtained on boiling up finely divided lead with absolute alcohol. A few drops of alcoholic mercuric chloride solution are added to facilitate the reaction, or dry air is bubbled through the heated mixture for the same reason.

The method has been extended to the preparation of lead methoxide, cadmium ethoxide, mercurous ethoxide, and silver ethoxide.

The reports of the research committees contained much valuable matter. That on dynamic isomerism dealt with the absorption-spectra of camphor and a number of its derivatives. The report of the study of hydroaromatic substances deals with the constitution of the 3 : 5-dichloro-*o*-phthalic acid obtained from dimethyldihydroresorcin and the preparation of 1 : 1 : 2-trimethylcyclohexanone.

The transformation of nitroamines committee report on the chlorination of anilides and the transformation of acylchloroaminobenzenes, and also on the bromination of anilides. The committee on isomorphous sulphonic derivatives of benzene state that during the past year the results obtained by the examination of twenty-nine derivatives of the 1 : 4 series have been discussed from the point of view of the Barlow-Pope theory, correlating crystalline structure with molecular form, and found to be in complete accordance with it.

GEOLOGY AT THE BRITISH ASSOCIATION.

AS was perhaps natural in a year when a geologist, Dr. Bonney, was president of the association, there was an excellent gathering at Section C, which was fortunate in being able to welcome, in addition to the president, Prof. A. P. Coleman, three other geologists from Canada, Dr. R. Bell, Mr. J. B. Tyrrell, and Prof. Spencer. The meetings of the section were well attended, the number of papers presented was sufficient to afford a full programme for the last day (Wednesday), and several well-sustained discussions took place. Any account of the sectional proceedings would be incomplete without a reference to the interesting series of excursions arranged by Mr. B. Hobson and Mr. Cosmo Johns. On Saturday there was a whole day excursion to the Castleton district under the leadership of Dr. Arnold Bemrose, while four half-day excursions were carried out. The sectional dinner was attended by more than sixty members. Successful joint meetings were held with the geographical section and agricultural sub-section; the papers read on the latter occasion are referred to in the report of the sub-section.

The great majority of the papers and reports read before the section were stratigraphical in character. In pre-Cambrian geology there was, in the first place, the president's address on "The Canadian Shield," already printed *in extenso* in NATURE (vol. lxxxiv., p. 333).

Two reports were also presented dealing with pre-Cambrian rocks, one on the composition and origin of the crystalline rocks of Anglesea, and one on Charnwood rocks.

Lower Palæozoic stratigraphy was represented by a paper by Dr. J. E. Marr and Mr. W. G. Fearnsides on the Lower Palæozoic rocks of the Cautly district, Sedburgh, and a further paper by Miss G. R. Whatney and Miss E. G. Welch described the graptolitic zones from the Salopian beds of the same area; the only other region in which the majority of these zones have hitherto been traced is the Welsh border country. Two reports relative to the Lower Palæozoic rocks were also presented; the committee appointed for the excavation of critical sections in the Palæozoic rocks of Wales and the west of England presented an important report drawn up by Mr. E. S. Cobbold on excavations among the Cambrian rocks of Comley, Shropshire, this including a general revision of the results yielded by the excavations of the past three years and a vertical section. An interim report on the rocks of the Glensaul and Lough Nafooey areas, cos. Mayo and Galway, was also read.

A number of papers had reference to Carboniferous strata. Mr. Cosmo Johns' lecture on local geology was chiefly concerned with the Carboniferous rocks, and he further presented a paper on the Yoredale series and its equivalents elsewhere. The report of the committee on the faunal succession of the Lower Carboniferous (Avonian) of the British Isles consisted of an important report drawn up by Dr. A. Vaughan correlating the Belgian succession of the Carboniferous limestone rocks with that of the south-west of England. Mr. E. E. L. Dixon presented a paper on the geology of the Titterstone Clee hills, and three important papers bearing on the Coal-measures of the south Pennine area were read, viz. that by Mr. H. Culpin on marine bands in the Coal-measures of south Yorkshire, that by Mr. W. H. Dyson on the Maltby deep boring, and that of Dr. L. Moysey on some rare fossils from the Derbyshire and Notts coalfield. Members of the section had an opportunity on one of the excursions of inspecting the fine collection of fossils at the Maltby mine, and of obtaining many for themselves, while Dr. Moysey kindly brought his collection to Sheffield, and it was on view during the meeting. A report was also presented by the committee for the investigation of the fossil fauna and flora of the Midland coalfield.

An important discussion took place relative to the concealed coalfield of Notts, Derby, and Yorkshire, which recent discoveries have proved to be far more extensive than was formerly supposed. Prof. P. F. Kendall, in opening the discussion, described the evidence for a great eastward and southward extension of the concealed coalfield, the south-western margin being probably formed by a prolongation of the ancient rocks of the Charnwood area. He further announced that coal had been met with in a boring at Scunthorpe, a point eleven miles to the east of its previously known extent. Triassic geology was represented by a suggestive paper from the Rev. E. C. Spicer on present-day Triassic condition in Australia, and by one by Mr. A. R. Horwood on the origin of the British Trias.

A number of papers and reports had reference to African geology. Dr. J. W. Gregory read a paper on the geology of Cyrenaica, Dr. J. D. Falconer one on the geology of northern Nigeria, and Dr. F. H. Hatch one on the geology of Natal.

A somewhat lengthy report on the correlation and age of South African strata was presented, and a second report on topographical and geological terms used locally in South Africa.

One of the most interesting discussions during the meeting was that following a paper by Mr. G. W. Lamplugh on the shelly moraine of the Sefström Glacier, Spitsbergen, and its teachings. Observations on this glacier, which is subject to somewhat rapid advances and retreats, showed that (1) in a very few years a thickness of some 70 to 80 feet of shelly Boulder-clay could be accumulated, the glacier scooping up the material from the sea bottom and pushing it before itself; (2) that in this clay uninjured shells occurred plentifully; (3) that within a few yards of the spot where the Boulder-clay was accumulating many forms of animal and plant life could flourish—all points of importance in helping to an understanding of British glacial deposits. Other papers referring to glacial geology

were a report on erratic blocks, and a paper by Prof. E. Hull on the glacial rocks of Ambleside.

Very few papers dealt with palæontological subjects. Mr. M. Odling described a problematical fossil from the Chipping Norton limestone, and Dr. M. C. Stopes read a paper on structural petrifications from the Mesozoic and their bearing on fossil plant impressions.

Sir T. H. Holland read a suggestive paper on the cause of gravity variations in northern India; Mr. T. Sheppard gave a well-illustrated account of the Humber during the Human period; Dr. Tempest Anderson showed a magnificent series of photographs in illustration of his paper on Matavannu, a new volcano in Savaii (German Samoa); and Dr. A. Irving read papers on the pre-oceanic stage of planetary development and on a buried Tertiary valley through the Mercian chalk range, and its later rubble drift. Prof. A. McWilliam described the metallurgical industries in relation to the rocks of the (Sheffield) district. Finally, reports were presented by Prof. J. Milne on seismology, and by Prof. W. W. Watts on geological photographs.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Gedge prize has been awarded to G. R. Mines, of Sidney Sussex College, for his essay entitled "Researches on the Physiological Action of Inorganic Salts chiefly in Relation to the Cardiac and Skeletal Muscles of the Frog."

R. H. Compton, Gonville and Caius College, has been elected to the Frank Smart (university) studentship.

The State Medicine Syndicate has appointed J. E. Purvis, of St. John's and Corpus Christi Colleges, to be secretary to the syndicate in the place of Dr. Anningson, who has resigned the office after twenty-five years' service.

The council of the Institution of Civil Engineers is prepared to consider applications for a nomination to the Palmer scholarship. The nominee must be the son of a civil engineer, must be desirous of studying and graduating at the University of Cambridge, and must be in such circumstances as to need the scholarship, which is of the annual value of 40*l*. Copies of the regulations may be had from the secretary of the institution, Great George Street, Westminster, S.W.

THE first course, dealing with neurology, of the Page May memorial lectures in physiology, will be delivered by Prof. C. S. Sherrington, F.R.S., at University College (University of London) on the following Mondays and Tuesdays, at 4.30 p.m.:—October 24 and 25, November 7 and 8, November 28 and 29. The lectures are open to the public without fee.

IT is announced in *Science* that at Yale University the salaries of professors and assistant professors have been increased by 9800*l*. from the alumni fund. The salaries of full professors are to be 800*l*. to 900*l*. and 1000*l*., based mainly on length of service, but modified somewhat by university responsibility and personal distinction. In the case of assistant professors the maximum salary is increased to 600*l*.

THE Aëronautical Society offers the following course of lectures at the Northampton Polytechnic Institute, Clerkenwell:—November 2: the study of dynamic flight, J. H. Ledeboer; November 16: the mechanics of the aëroplane, Algernon E. Berriman; November 30: theory and design of propellers, T. W. K. Clarke; January 11, 1911: aëroplane surfaces and controls, with some remarks on chassis, Herbert F. Lloyd; January 18: the motive power in aëroplanes, Captain A. D. Carden, R.E.; January 25: lines of aëronautical research, Bertram G. Cooper. The lectures will be given on Wednesdays at 8 p.m., and applications for tickets are to be addressed to the secretary of the Aëronautical Society, 53 Victoria Street, Westminster, S.W.

A CIRCULAR letter has been issued from the Education Offices of the London County Council inviting from the optical trade an expression of opinion on the advisability of endowing a central opto-technical institute at a cost of probably 30,000*l*. for the building alone. As a successful issue to this project is dependent mainly on the expression of a large volume of trade opinion in its favour, Mr. J. Aitchison arranged for a meeting of opticians to be held on Monday last, October 17, at Anderton's Hotel, Fleet Street, E.C., at which it was resolved to support the suggested establishment of an opto-technical institute in Clerkenwell "to further the work which has been hitherto carried on at the Northampton Institute, and has proved of great value to the optical industry." In his letter convening the meeting Mr. Aitchison remarked:—"Whatever difference may still exist between different parties in the trade, all are agreed to cooperate in whatever seems to be possible for the advancement of our industrial status, by forwarding the course of technical education and concentrating public attention on the importance of the movement."

THE first part of "Statistics of Public Education in England and Wales" for 1908–9 is now available (Cd. 5355). It deals entirely with educational statistics. New tables have been added this year giving particulars as to the occupations of the fathers of pupils and as to the previous education of pupils in secondary schools. The tables dealing with technical education remain much the same as in previous years. Before giving particulars as to the number of technical institutions in England, it must be pointed out that the Board of Education defines a technical institution as one giving an organised course of instruction in day classes, including advanced instruction in science, or in science and art, and provided with a staff and equipment adequate for the purpose. Provision must be made in such institutions for at least a two years' systematic course in science, or in science and art, either alone or in conjunction with subjects of general, commercial, manual, or technological instruction. Except in special cases no student may be admitted to the course unless he has passed through at least a three years' course of instruction in a "recognised" secondary school, or is more than sixteen years of age and qualified by his general education to profit by a course of advanced instruction. In 1908–9 forty such institutions were recognised by the Board of Education, and they provided 121 courses. The number of teachers in the institutions was 787, and the number of students who attended at any time during the year was 3314. Of the teachers 766 were men, and of the students 3091 were boys and men. As regards the age of the students, it may be said that 1046 were under eighteen years of age. The number of efficient secondary schools on the Board's grant list was 804 in 1908–9. These schools provide a progressive course of instruction in the subjects necessary to a good general education upon lines suitable for pupils of an age-range at least as wide as from twelve to sixteen or seventeen. Among other things, an adequate proportion of the pupils must remain at least four years in the school. In these 804 efficient schools there were 4338 men- and 4098 women-teachers teaching 73,270 boys and 62,401 girls.

SOCIETIES AND ACADEMIES.

MANCHESTER.

Literary and Philosophical Society, October 4.—Mr. Francis Jones, president, in the chair.—T. **Thorp**: A method for preventing the tarnishing of silver-on-glass parabolic mirrors. The mirror was carefully levelled on a turntable, and its axis of rotation made coincident with that of the turntable. The whole was then rotated uniformly at the calculated speed required to cause a liquid to assume the same parabolic form as that of the mirror. A 1 per cent. solution of "Schering's" celloidine in amyl acetate (after a lengthy period of settling) was flooded on to the surface of the mirror to a depth of about one-third of a millimetre. This was allowed to dry very slowly, when the resultant film was found to have a perfectly even surface of a thickness of about 1/300th of a millimetre. On testing the mirror no perceptible loss