generated by the mere act of stretching or expanding the cap over the end of the shell. If this be so, the inertia of the metal in the cap must play an important part. At the critical moment when the hard point of the shell meets the plate, there is a sudden distortion of the shell and plate near the point of contact. This distortion is the cause of breakage. One can see that the mass of mild steel surrounding the point of the shell, and pressed into firm contact with it, might by its inertia oppose a powerful resistance to this sudden change of form, and so support the shell during the minute fraction of time which determines whether it or the plate shall go.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

BIRMINGHAM.—At the last meeting of the City Council the recommendation of the Education Committee to allot to the University the proceeds of a penny rate was discussed. The amount which would have been raised by such a rate is about 16,000*l.* at present, and would increase with the growth of the city. Some opposition to the recommendation was made by the supporters of the Birmingham and Midland Institute, who wished 1000*l.* per annum to be granted to that institution. Further opposition came from some of the Socialist members of the Council on the ground that the money would be better spent in increasing the facilities for secondary education to the poorer classes. A letter was read from the Board of Education pointing out that the ear-marking of so large a sum as that required by the Education Committee for additional scholarships would materially lessen the value of the grant to the University for the purpose of diminishing its present debt, and this would be taken into consideration in allotting the Treasury grant, which was to be allocated to the various applicants in proportion to the amount of local support forthcoming. The result of the discussion was the assigning of a sum of 15,000*l.* per annum from April 1 until further notice.

The annual reports of the University Council and Principal have been published, from which it appears that the total number of registered students during the past session was 1017, as against 958 for the previous session. The Principal again emphasised the need for a chair of Greek. He also hoped that some further development in facilities for agricultural studies would be made during the present session.

Prof. John Joly, F.R.S., has been appointed Huxley lecturer for the current session.

OXFORD.—The following letter has been addressed to the Vice-Chancellor by Prof. Karl Pearson, F.R.S.:—

"Dear Mr. Vice-Chancellor,

"I feel very deeply indeed the honour which has been conferred on me by the award of the Weldon Prize. I realise fully also the difficulties under which the Electors have been placed owing to the terms of the statutes. But as one who was partly instrumental in founding the prize, and who also had many opportunities of knowing the views held with regard to such prizes by the man whose work it commemorates, will you allow me to be at once very grateful for the award and yet to ask the University to pass me over in its selection?

"I feel strongly that, whatever the formal wording of the statutes may be, the intention of the donors and the spirit of the late Prof. Weldon, which influenced their foundation, was the encouragement of younger men, to whom timely recognition may mean an all-important indication that their work is appreciated and their chosen path a fitting one.

"KARL PEARSON."

DR. A. H. FISON has been appointed secretary of the Gilchrist Educational Trust, in succession to the late Dr. R. D. Roberts.

MR. ALFRED SCHWARTZ has resigned the professorship of electrical engineering in the Manchester University and the School of Technology on his appointment by the President of the Board of Education to a staff inspectorship in engineering under the Board. The resignation dates from March 31.

THE issue for January of *The Technical Journal*—the organ of the Association of Teachers in Technical Institutions—is full of material of interest to the members of the association and others engaged in technical education. Among the most noteworthy contributions may be mentioned the statement of the evidence given by the Association of Teachers in Technical Institutions before the Royal Commission on University Education in London, and the presidential address of Mr. Barker North at the annual meeting of the association last November. A portrait is included of Mr. J. H. Reynolds, whose retirement from the principalship of the Manchester Municipal School of Technology will take place shortly.

IT is announced in *Science* that the directors of Bryn Mawr College have formally accepted the bequest of 125,000*l.* made by the will of the late Emma C. Woerishoffer, of New York, who was killed in an automobile accident last summer. The whole sum has been constituted as a permanent endowment fund. From the same source we learn that the sum of 10,000*l.* has been given to Beloit College by Mrs. Rufus H. Sage, of Chicago. The total endowment of this college—in interest-bearing securities—is now increased to 250,000*l.*, in addition to the value of the buildings. A third gift, reported in the same issue of our contemporary, is that of Mr. Robert W. Sayles, in charge of the geological section of the Harvard University Museum, who has given the sum of 1000*l.* to the Seismological Society of America, to aid in the publication of the society's Bulletin.

THE Child Study Society of London announces that a conference of combined societies will be held in the University of London on May 9 to 11 next under the presidency of Sir James Crichton Browne, F.R.S. The subject for discussion at the conference will be "The Health of the Child in relation to its Mental and Physical Development." Papers will be contributed to introduce discussions on the "Influence of Defects of Hearing, and of Vision, in relation to the Mental and Physical Development of the Child," by Dr. J. Kerr Love and Mr. N. Bishop Harman; "The Tuberculous Child," by Dr. Jane Walker; "Mental Hygiene in relation to the Development of the Child," by Dr. Theo Hyslop; and "Instruction of the Young in Sexual Hygiene," by Dr. G. Eric Pritchard. A lecture to the conference on "Eugenics and Child-study" will be delivered by Dr. C. W. Saleeby.

THE council of Bedford College has announced that the 100,000*l.* required to erect the new buildings at Regent's Park and to inaugurate an endowment fund has now been obtained. As has been recorded in these columns, 50,000*l.* had been raised by the beginning of November last for the building fund, 20,000*l.* of it being promised by the London County Council, who also promised 10,000*l.* more if the college could raise a similar sum immediately. By the end of last year the college raised the amount named, and secured the further grant. We learn from *The Times* that the council has now been informed by Lord Haldane, president of the building and endowment fund, that he has received from a donor who desires at present to withhold his name the promise of 30,000*l.* towards the fund. Simultaneously with this donation comes the promise from another anonymous donor of 10,000*l.* for the erection of a hall and common rooms, while the Worshipful Company of Goldsmiths has granted 5000*l.* towards an endowment fund.

THE International Commission on Mathematical Education will meet at Cambridge on August 22–28, on the occasion of the fifth International Congress of Mathematicians. It will be remembered that the commission owes its existence to a resolution of the Rome Congress of 1908. The educational subjects proposed for discussion are the following:—(1) intuition and experiment in mathematical teaching at secondary schools, in particular, the use of drawing, measurement, and calculation (numerical

and graphical) in the upper classes of schools that prepare for the universities; (2) mathematics as needed in the study of physics. In preparation for these discussions, information is being collected as to the conditions prevailing in different countries. The information collected will be published in *L'Enseignement Mathématique* (Paris: Gauthier-Villars); and as regards the position of (1) in this country, a report in greater detail will be published by the Board of Education. The meetings and other proceedings at Cambridge will be open to all who pay the subscription of a guinea.

THE annual report of the council of the Institution of Mechanical Engineers includes as an appendix a draft scheme for associate membership examinations. Just as the Institution of Civil Engineers and the Surveyors' Institution have found it expedient to hold similar examinations, the council of the Institution of Mechanical Engineers is of opinion that the time has come for instituting an entrance examination for the younger applicants for admission to its institution. The council suggests (1) that the examination should be taken, especially by graduates, at as early an age as possible, and in order to bring such a scheme gradually into operation it might be desirable that it should apply in the first year only to candidates of twenty-eight years of age and under, in the second year to candidates of twenty-nine years of age and under, and in the third and subsequent years to candidates of thirty years of age and under; (2) that no examinations need be held abroad at present; (3) that, so far as possible, examinations of universities and colleges or other public examining bodies should be accepted as exempting from the institution examination, it being understood that only such examinations as are of at least a standard equal to the institution examination will be accepted. A list of examinations which might be accepted as exempting candidates is provided, and it may be noted this list includes the engineering degrees of British universities, the diplomas of the City and Guilds College, University College and King's College, London, and Whitworth scholarships and exhibitions. The suggested subjects of examination are grouped under general, scientific, and technical knowledge.

THE standing committee, of which Sir Matthew Nathan is chairman, dealing with the employment of boy labour in the Post Office, has issued its second report. In the first report, published last year, a number of recommendations were made, which have been acted upon. A scheme of education for the boys, designed to improve their qualifications and to fit them for further employment, has been approved by the Postmaster-General. The number of boy messengers was reduced from 15,790 in March, 1911, to 14,506 in September, 1911. Instead of there being only 1900 vacancies per year in the Post Office service for these boys to fill later, a revised estimate gives the number as 2350, of which 1280 are for postmen. The Navy and the Royal Engineers can also take some of the boys for special service. The report deals also with the boys' training for subsequent employments. A useful purpose is served by the boys' institutes, which are carried on mainly by the voluntary work of local officials, and receive grants amounting to 2000*l.* a year from the Treasury. The evening schools of local education authorities also have been made use of, half the boys' fees being paid out of institute funds. The number of boys who attended classes during the session 1910–11 in London and seventy-eight provincial towns was 6479, or about 70 per cent. of the whole number employed in those towns. To remedy irregular attendance, which has been somewhat pronounced, the committee recommended compulsory attendance at the classes, and a minimum of four hours a week, from September to April, was fixed, this being made a condition of employment during the boys' first two years of service. Special classes for the boys are recommended, and an essential feature is that the boys' attendances are to be arranged so that each class should always be composed of the same boys. The committee approached the Postmaster-General with these recommendations, and he approved of their being carried out without delay. The committee has come to the conclusion that the basis for permanent employment shall be a competitive examination in the subjects taught at the compulsory classes.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 8.—Sir Archibald Geikie, K.C.B., president, followed by Sir Alfred Kempe, vice-president and treasurer, in the chair.—Sir Norman **Lockyer**: The spectrum of comet Brooks (1911*c*). In this paper an account is given of the lines shown in a series of ten photographs of the spectrum of comet Brooks, taken between September 6 and October 31. Seven of the photographs were taken while the comet was an evening object, and three when it was a morning object. The instrument used was a 2-in. quartz-calcite prismatic camera. In the best spectrum (September 30), in addition to the well-established carbon or carbon-compound bands at λλ 3883, 4737, 5165, 5635, other radiations were seen at λλ 310, 316, 337, 405, 421, and 436. Line λ 421 is probably the cyanogen band, the head of which is λ 4216. So far as is known, the ultra-violet bands λλ 310, 316, 337 have not been recorded in the spectrum of any previous comet. Attempts have been made to ascertain the chemical origin of these lines by reference to published records of laboratory spectra, and to recent photographs of the spectrum of CO taken with the quartz-calcite prism, but with no success. Although no definite changes in the relative intensity of the cometary lines were noted amongst the earlier photographs, a comparison of the best of these (September 30) with that of October 31, when the comet was a morning object, showed the following changes:—(1) On September 30 line λ 4216 was weakest of the three subsidiary lines λλ 405, 4216, 436. On October 31 it was strongest. (2) Lines λλ 3883, 4737 were of about equal intensity on September 30. On October 31 λ 3883 was distinctly the stronger. (3) The ultra-violet lines λλ 310, 316, 337, shown in the spectrum of September 30, were not seen on October 31. A photographic comparison is given of the Kensington spectrum of comet Brooks (September 30) with that of comet Daniel (1911*d*), reproduced by Campbell in Lick Bulletin No. 135. Although the latter showed far more detail, being photographed with a slit spectrograph, it is fairly evident that the spectra of the two comets are very similar.—Hon. R. J. **Strutt**: A chemically active modification of nitrogen, produced by the electric discharge.—III. (1) Active nitrogen emits its energy more quickly, and reverts sooner to ordinary nitrogen, if it is cooled. This is apparently a unique instance of a chemical change accelerated by cooling. (2) If the glowing gas is compressed to small volume, it flashes out with great brilliance, and exhausts itself in so doing. This proves that the glow-transformation is polymolecular, *i.e.* that more than one molecule must take part in it. (3) Active nitrogen may revert to ordinary nitrogen in two distinct ways. One of those is a volume change, accompanied by glow; the other a surface action of the walls of the vessel, without glow. This is analogous to the behaviour of oxyhydrogen gas in its transformation to water, which may be a surface or volume effect, according to circumstances.—R. **Whytlaw-Gray** and Sir W. **Ramsay**: The atomic weight of radium. The material for this research consisted of 330 mg. of a mixture of radium and barium bromides, containing 206 mg. of radium bromide, supplied by the courtesy of the British Radium Corporation. The bromides were submitted to methodical fractional crystallisation, and yielded specimens of which the change in weight on conversion from bromide to chloride with gaseous hydrogen chloride, and from chloride to bromide with gaseous hydrogen bromide, was determined with the micro-balance. The atomic weight increased progressively from 220·7, through a series of approximations, to the final atomic weight 226·36, the last five determinations giving the figures 226·40, 226·25, 226·35, 226·35, and 226·45. The paper contains remarks on the differences in terms of multiples of the atomic weight of helium between the recorded determinations of the atomic weight of uranium and radium on the one hand, and of radium and lead on the other, and it is pointed out that a careful revision of the atomic weights of lead and of uranium, especially of the latter, is much to be desired.—Dr. J. A. **Harker** and Dr. G. W. C. **Kaye**: The emission of electricity from carbon at high temperatures. This paper discusses several new phenomena, among which are the generation of electric