But there can be no doubt that these godchildren of the German Emperor will in the healthy air of the Grunewald soon develop great strength from the liberal nutrition supplied by their patrons, and grow up into renowned centres of research.

We may therefore confidently hope that in later years the foundation to-day of the Kaiser-Wilhelm-Gesellschaft will be regarded as an unmixed blessing to scientific research in Germany.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—It is proposed to alter the regulations for the diploma of agriculture so as to ensure that agricultural physiology shall be one of the compulsory subjects for part ii. of the diploma examination. It is also proposed to abandon the present method of grouping the subjects, and that in part i. of the diploma examination a candidate who has obtained honours in the natural sciences tripos shall be excused chemistry if he has passed chemistry in the tripos, botany if he has passed botany in the tripos, and zoology if he has passed either zoology or physiology.

MR. H. MAXWELL-LEFROY, Imperial entomologist for India, will give the inaugural lecture of his course on entomology at the Imperial College of Science and Technology on Thursday, March 2, at 5 p.m.

PROF. V. H. BLACKMAN, who since 1907 has occupied the chair of botany in the University of Leeds, has been appointed to the professorship of plant physiology and pathology at the Imperial College of Science and Technology at South Kensington. He will take up his new duties at the beginning of July.

ON several occasions we have directed attention to the useful work done by Prof. Perry, F.R.S., through his system of bursaries, which he established at the Royal College of Science in 1902 with a contribution of 100*l.* from the Drapers' Company. The bursary fund was established particularly for the benefit of national scholars, but the scholarships held by these students have now been increased in value sufficiently to render Prof. Perry's bursary fund unnecessary. A final balance-sheet dealing with the period between July 17, 1908, and January 24 of the present year, has been published in the current issue of *The Phoenix*, the magazine of the Royal College of Science and Royal School of Mines. During the years since Prof. Perry inaugurated the scheme, the sum of more than 1600*l.* has been disbursed to students needing judicious assistance in a tactful way. We have reason to know that it is seldom that such a sum of money is spent with so great an advantage to the beneficiaries.

THE successful students of the City and Guilds of London Institute received their prizes from the Lady Mayoress at the Mansion House on February 17. On this occasion the honorary secretary of the college, Sir John Watney, announced that the name of the City and Guilds Central Technical College will be changed to the City and Guilds Engineering College, and as such will constitute the engineering department of the Imperial College. It will be managed by a delegation representing the City and Guilds Institute, the Imperial College, and the Goldsmiths' Company. After the distribution of prizes, Dr. R. T. Glazebrook, F.R.S., director of the National Physical Laboratory, delivered an address on the interdependence of science and industry. He said the agencies at work in London applying science to the wants of industry included the university colleges, the polytechnics, and the technical schools. He asked, Is it not possible to conceive some scheme by which the labours of such agencies can be coordinated and linked up with the Imperial College as a centre where the staff and students will be free to conduct original investigations, and, through these, to learn new truths? Under such a scheme the Imperial College would become, first, the Central Technological University for London, and then for the Empire. A body like its governing body, modified so as to include representatives of the other institutions, forming with it the technological side of the University in London, would become the council of the faculty. He put forward the following propositions:—(1) that a combination of the technological departments of existing institutions and schools into an independent technological faculty is necessary; (2) that in such a faculty a definite value should be given to technical education in each London school; and (3) that the technological faculty should confer degrees under conditions to be laid down by the faculty.

IN the French Chamber of Deputies on February 16, M. Maurice Faure, Minister of Public Instruction, summed up the discussion on the estimates for his department. From the report by the Paris correspondent of *The Times*, we learn that, with reference to higher education, M. Maurice Faure said that the French universities, which are autonomous, thanks to the legislation of 1896, and have been endowed by the State with foundations amounting to more than 1,000,000*l.*, are keeping pace with modern requirements, and are extending their influence abroad as well as at home. New laboratories are being erected by the Sorbonne in the Rue Saint Jacques, the University of Nancy has opened an electrotechnical institute, at Grenoble there is now a new paper-making school, at Lyons a new chemistry school, at Lille various new mining courses, at Dijon an agricultural and œnological institute, and fresh technical subjects have been introduced into the curriculum at Toulouse, Caen, Rennes, and elsewhere. Foreign students are being attracted in increasing numbers, and abroad there have been established French institutes at Florence and at Madrid, which are respectively affiliated to the University of Grenoble and to those of Bordeaux, Toulouse, and Montpellier. The foundation of similar institutes is contemplated at St. Petersburg under the auspices of the Sorbonne, and at Constantinople under the auspices of the University and City of Lyons. The creation of a chair of colonial history in Paris has been proposed by the Budget committee, and the faculty of medicine is to be asked to consider a proposal in favour of the foundation of a chair of climatology and mineral hydrology, the cost of which the various French spas and watering-places have offered to defray. In the secondary schools, the paramount claims of purely scientific studies has been recognised in accordance with modern requirements.

THE third annual meeting of the Old Students Association of the Royal College of Science, London, was held at the college last Saturday, the president, Sir Thomas H. Holland, F.R.S., presiding. Sir Alexander Pedler, F.R.S., was elected president for 1911, and Mr. T. Ll. Humberstone and Mr. A. T. Simmons were re-elected secretary and treasurer respectively. A draft report, prepared by a special committee, for the Royal Commission on University Education in London, was considered and adopted. In the evening, the third dinner of old students was held at the Criterion Restaurant, about ninety being present. Prof. Edgeworth David, F.R.S., an old student of the college, in proposing the toast of the Royal College of Science, referred to the request of the association for the representation of old students on the governing body of the college. It was, he said, the academic thing to do, for no one could better appreciate the needs of a college than the men and women who had graduated there. The principle was recognised throughout the universities of the world, and had been adopted with marked success in his own University of Sydney. Mr. William Burton, in replying to the toast, expressed the hope that better provision would in the future be made for the financial and social needs of the scholars attending the college. The chairman, Sir Thomas Holland, in responding to the toast of the Old Students Association, proposed by Mr. G. T. Holloway, referred to the adoption of an academic costume for associates, which, he said, secured the definite recognition of the college. But, in maintaining the rights of the college and the interests of the association, he urged old students not to forget that they belonged to a larger college in which other interests were represented. The association were indebted to their governors for the sympathetic way in which they had met the demands of members. Sir Alexander Pedler, F.R.S., the new president of the association, proposed the toast of the Guests, for whom Dr. A. D. Waller, F.R.S., replied.

IN reply to a question in the House of Commons last week, the Home Secretary stated that the Pharmaceutical

Society is considering certain questions connected with the educational curriculum of pharmaceutical chemists and of chemists and druggists with the view of framing bye-laws in pursuance of the powers vested in them by the Poisons and Pharmacy Act, 1908. At the present time, candidates for the qualifying examination in pharmacy are not required to undergo a systematic course of instruction, and it is no part of the duty of the society to inquire how or where they were educated. In the absence of a compulsory curriculum, "cramming" is very prevalent in connection with this examination, the result being a high percentage of failures. Thus last year, out of 1027 candidates who entered for the examination, 620 were unsuccessful. Before actually proceeding to frame bye-laws, the council of the society has drafted a scheme, which has been submitted to pharmaceutical associations in all parts of the country and to the principals of schools of pharmacy, with the object of eliciting expressions of opinion on the matter. The draft scheme suggests that the examination be divided into two parts, and that a candidate desiring to enter for the intermediate examination shall produce evidence that, subsequent to passing the preliminary examination and being registered as a student, he has attended, in a teaching institution approved by the council, not fewer than 50 lectures in botany, 100 lectures in chemistry, and 25 lectures in physics, and has done 25 hours' work in practical botany and 300 hours' work in practical chemistry. As to the final examination, it is proposed to require candidates—who must have been engaged for three years in the ordinary work of pharmacy under the supervision of a pharmacist—to produce evidence of having attended at a recognised institution 60 lectures and demonstrations in materia medica, 30 lectures in pharmacy, and 20 lectures in dispensing and prescription Latin, and of having done 200 hours' work in practical pharmacy and 100 hours' work in practical dispensing. The proposals have already been discussed by a number of pharmacists' associations, and divergent opinions have been expressed. While some are in favour of adopting the scheme, others are pressing more especially for a modification of that part of the proposed curriculum which precedes the intermediate examination, and the council is being urged to consider the advisability of accepting the certificates of other examining bodies in lieu of the intermediate examination.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 16.—Sir Archibald Geikie, K.C.B., president, in the chair.—W. **Rosenhain** and S. L. **Archbutt**: The constitution of the alloys of aluminium and zinc. In connection with researches on light alloys, carried out on behalf of the Alloys Research Committee of the Institution of Mechanical Engineers, the authors have studied the constitution of the Al-Zn alloys by pyrometric and microscopic methods, including the study of specimens after prolonged annealing at definite temperatures and after quenching. The results are represented in an equilibrium diagram differing materially from those previously put forward. The principal points of difference are:—(1) The liquidus curve shows a small break at a concentration of 85 per cent. of zinc, this break being connected with the formation of a definite compound of probable formula Al_2Zn_3. (2) In alloys under conditions of complete equilibrium the occurrence of eutectic ceases at a concentration of about 78 per cent. of zinc, although in ordinary slowly cooled alloys the eutectic can be traced down to the vicinity of 50 per cent. zinc. (3) At a concentration of about 78 per cent. of zinc, the solidus curve of the alloys rises abruptly from the eutectic line (380° C.) to a horizontal line of arrest points at 443° C. This line commences at the break in the liquidus curve already mentioned, and extends to about 37 per cent. of zinc; between 78 and 40 per cent. this line represents the solidus, but near 40 per cent. the solidus bends upwards towards the melting point of pure aluminium. The reaction indicated by this line of arrest points is the formation of a compound (Al_2Zn_3) by the reaction of crystals of a solid solution of zinc in aluminium with the residual liquid. (4) A second horizontal line of arrest points of considerable intensity has been found at 256° C. in alloys containing 99 to 35 per cent. of zinc. These heat evolutions are due to decomposition of the compound (Al_2Zn_3) into two phases, one of which is the saturated solid solution of Zn in Al, while the other is practically pure Zn. (5) The existence of a definite compound is indicated, stable only between 443° C. and 256° C., and having a zinc content of about 78 per cent., most nearly represented by Al_2Zn_3. Evidence for its existence is derived from the termination of the eutectic line and the position of maximum intensity of the line of heat evolutions just mentioned; this is strikingly confirmed by the micro-structures, which show the compound in the form of characteristic hexagonal dendrites. When decomposed (at or below 256° C.), it exhibits a duplex laminated "pearlitic" structure strikingly resembling the pearlite of carbon steel.—R. **Whiddington**: The production and properties of soft Röntgen radiation. Röntgen rays from ordinary bulbs are usually produced at generating potentials of between 10,000 and 100,000 volts. It is possible by using a special tube with a very thin aluminium window to experiment with rays generated at only a few hundred volts. The rays dealt with in this paper were generated at 1000 to 3600 volts. It has been found that such soft Röntgen rays have much the same properties as the harder rays usually experimented with. They produce ionisation in air, affect photographic plates, and can excite secondary radiations when incident on solid bodies. Their range in air, however, is not many centimetres. For many purposes a Röntgen radiation is sufficiently defined by a knowledge of (1) the total energy; (2) the penetrating powers in absorbing screens. These two properties have therefore been investigated in some detail, with reference particularly to the influence exerted by (1) the material of the antikathode; (2) the potential at which the rays are generated. The antikathodes used fall naturally into two groupings:—Group A.—Al, Pt. Group B.—Ag, Cd, Cu, Fe, Ni, Pb, Sb, Sn, Zn. The antikathodes of Group A emit secondary radiations, those of Group B do not. Experiment indicates that Al emits a soft characteristic radiation of λ/ρ 580 (in Al). In order to arrive at a common explanation of a number of experimental results, it is suggested that this Al radiation disobeys the law of "Röntgen ray fluorescence" recently advanced by Barkla.—Prof. J. **Eustice**: Experiments on stream-line motion in curved pipes. In a paper on the flow of water in curved pipes, the author has shown that during the flow of water through a pipe, if a change is made from a straight to a very slightly curved form, there is an increased resistance to flow, which is very marked at velocities below the critical velocity. In order to find the cause of the increase in resistance, an apparatus was designed which provides for the distribution of six variously coloured filaments of dyed water into a glass pipe through which water is flowing. The positions of the filaments can be so arranged that in the passage of water from a straight to a curved pipe the directions of the stream-lines in any part of the tube can be investigated. The experiments show that the curvature of a filament is less than the curvature of that part of the pipe in which the filament is flowing, and if the velocity of flow increases the curvature of the filament increases. The filaments impinge on the outer wall of the pipe, and, flattening into bands, follow the surface of the pipe and cross over to the inner wall, where the filaments start again in their path along the main stream, until (if the pipe is sufficiently long) the filaments again meet the outer wall, when the return flow along the surface is repeated. A filament flowing in the central plane of the pipe, when reaching the outer wall, divides into two parts, which come together on the inner wall of the pipe; the other filaments flow through the loop which is thus formed. A filament not in the central plane remains on that side of the plane in which it enters the curved pipe. The experiments were extended to angle pipes, and the velocities were increased until turbulent motion was obtained. After flowing through a curved pipe or angle, vortices are generated which persist in a contiguous straight pipe.

Challenger Society, January 25.—Dr. G. H. Fowler in the chair.—Commander Campbell **Hepworth**: Remarkable displays of phosphorescence in the sea. These displays took the form of rapidly moving curved bands of lumin-