that the defects of our present system make themselves manifest. You keep a child at school for eight or nine years, and just at the critical time when his natural aptitudes are taking their bent and his character is forming his education is broken off, and the boy and the girl who might have done good service in some profession or skilled industry drops into idleness or loafing, or adds one to the millions of casual and unskilled labourers. I say with conviction that the first upward step must be the improvement of our intermediate education, because that is the branch in which we are most lacking. You may not always find a genius—a genius is rare—but remember that if you do find him you will have repaid yourselves more than a hundredfold. Remember the economic value of a great inventor covers the educational expenditure of a whole town. I think Sir Henry Bessemer was a fellow-townsman of yours here in Camberwell, and Sir Henry Bessemer's chief invention, we know, was equal in productive power to the labours of a hundred thousand men. Now, that is why I say that we must be prepared for further expenditure if we are to get the economic equivalent for what we have spent already. We must be prepared as a country to foot the bill, just as the Government will be prepared to make the proposals to the country. The Government policy is a large policy, and I may say that it is our intention not only to increase the amount of the grant, but to change the manner of its distribution, so that of two areas equally efficient the poorer will receive the larger grant, and of two areas equally necessitous the more efficient will receive the larger grant."

A SUGGESTIVE paper was read by Mr. Cloudesley Brereton at a conference of employers of labour on October 28, in connection with the recent National Gas Congress and Exhibition. Mr. Brereton pointed out that although until recently education in England has busied itself far too little, upon the whole, with the problems of the work-a-day world, yet even the older English Universities of Oxford and Cambridge in actual practice have always been to a considerable extent technological institutions. Their work has been mainly, not so much the imparting of book knowledge, but of "mancraft," the art of handling men, gained through daily contact with their fellows. In so far as the studies of candidates for theology, medicine, and law are concerned, these Universities are to all intents and purposes purely technological colleges. At the present time in the older, and to a far greater extent in the younger, universities we find training in technique provided in many subjects, not merely in law, medicine, and theology, but also in engineering, applied chemistry, the textile industries, gas and electricity, and certain branches of commerce. Whatever the grade of educational institution may be the problem of suitable curricula can only be solved by first considering what will be the probable career of the pupil. The elementary school is already moving in the direction of first diagnosing the pupil's future needs and then prescribing for him. Even the older universities and the public schools are showing signs of being affected by similar influences. Employers, in consequence of the increasing pressure of competition and the invasion of industry by science, are as vitally interested in the production of pupils of the right type as the educationist is, or ought to be. Mr. Cloudesley Brereton gave a valuable summary of the principal steps which have been taken by employers to foster the continued education of their employees, *e.g.* by the award of prizes for attendance and success at examinations, the payment or repayment of fees, making attendance at evening classes compulsory upon junior employees, meetings at works during the hours of employment, and the formation of advisory committees containing representatives of employers and workmen. Important educational results are accruing from such organised schemes of training as those at Sunderland for engineering apprentices, and at the Bournville works. With regard to the question of raising the age of attendance at school to sixteen or seventeen, he suggested that one great difficulty, apart from the cost, is the growing dissatisfaction with the mainly literary type of education, and the conviction that our present system does not give value for the public money now granted.

AT the distribution of prizes to successful students of the City and Guilds Institute at the Mansion House on October 29, the President of the Board of Education delivered an address. Mr. Pease dealt with the question of a worthy university for London. He said that the Government, after careful consideration, has decided that the scheme set out in the report of the recent Royal Commission is calculated to produce a University of London worthy of the name. Everything possible is to be done to carry out the scheme with all reasonable dispatch. To this end a Departmental Committee has been appointed. The underlying principles of the Commission's scheme are to be regarded as accepted. Modifications in detail and machinery may be found desirable, but the fundamental principles must be accepted if any advance is to be made now. If London shows that it is anxious and willing to have a reconstituted University on the lines laid down in the report of the Royal Commission, the Government will play their part in supplying the money necessary. Continuing, Mr. Pease said:—"The whole history of the development of modern universities shows that the prime essential of success is local patriotism. Local patriotism means, of course, money, but it means a great deal more besides. It implies a belief in the necessity for a great university and in the immensity of the influence the university can exercise—an influence which, especially in the case of an Empire metropolis, must always extend far beyond the narrow limits of the area which the university primarily serves. Its functions will be Imperial, even international, as well as local. But without the active support and confidence of the locality no modern university can exist, let alone flourish. Acts of Parliament and State-aid cannot alone create a university." In the case of the University of London, Mr. Pease laid it down that the principles on which any permanently satisfactory scheme must be based are simple:—(1) Educational and financial control of all the most important colleges to be in the hands of the University; (2) the creation of a University quarter by concentration of as much of the University work as possible, together with its administration, on a central site [the Imperial College must remain where it is]; (3) government of the University by a small Senate, predominantly lay, and not representative of special interests; (4) control of the teaching and examination in the hands of the teachers; (5) continuance of access to University examinations by external students. The place of the Imperial College in a reconstituted University is one of the first points the Departmental Committee proposes to investigate.

SOCIETIES AND ACADEMIES.

CAMBRIDGE.

Philosophical Society, October 27.—Prof. Hobson in the chair.—R. D. **Kleeman**: The dependence of the relative ionisation in various gases by β rays on their velocity, and its bearing on the ionisation produced by γ rays.—N. P. **McCleland**: Note on a dynamical system illustrating fluorescence.

PARIS.

Academy of Sciences, October 27.—M. P. Appell in the chair.—The President announced the death of M. Lucas Championnière.—Maurice **Hamy**: An arrangement of spectrograph with an objective grating suitable for the measurement of radial velocities.—H. **Deslandres** and L. **d'Azambuja**: Laws relating to the structure of band spectra and to the deviations from their arithmetical series. A study of the second group of nitrogen bands. The formula expressing the results differs from that applicable to line spectra.—Ch. **Moureu**, P. Th. **Muller**, and J. **Varin**: Refraction and magnetic rotation of compounds containing the acetylene group. Experimental data are given for ninteen substances containing the group $-C\equiv C-$.—M. **Depéret** was elected a non-resident member.—A. **Claude** and L. **Driencourt**: A coincidence micrometer free from the personal equation. This method is based on the use of a deformable micrometer network, one set of wires being capable of moving, retaining their parallelism; the distance between the wires is equal to the path described by the image of an equatorial star in the principal focal plane during an integral number of beats of the chronometer. So soon as the star enters the field, the first wire is set to coincide with the image at a beat of the chronometer. If the adjustment is exact, the passage over the next wire will also coincide with a beat, and this can be repeatedly verified. The method of observation is capable of a very high precision.—P. **Chofardet**: Observations of the new comet 1913*e* (Zinner) made at the Observatory of Besancon.—Jean **Chazy**: Certain trajectories of the problem of *n* bodies.—MM. **Chipart** and **Liénard**: The sign of the real part of the roots of an algebraic equation.—Georges **Rémoundos**: The theorem of Picard in a circle of which the centre is a critical algebraic point.—Maurice **Janet**: The existence and determination of solutions of systems of partial differential equations.—Henri **Villat**: The validity of the solutions of the problems of hydrodynamics.—Emile **Borel**: Kinematics in the theory of relativity.—M. **Girousse**: The electrolysis of lead and iron in the soil: a discussion of the effects of stray currents from tramway systems. It is pointed out that the usual rule, a drop of potential of not more than one volt per kilometre, is insufficient. The essential point is the difference of potential between the metallic substances capable of being attacked and the tramway rails. It is shown that the amount of moisture in the soil is one of the main factors of the problem. The resistance of the contact surface is also important; the contact of lead with earth is much more resistant than the contact of iron with earth. No critical potential is required to produce electrolytic effects.—G. **Sagnac**: Luminous æther demonstrated by the effect of the wind relative to the æther in an interferometer in uniform rotation.—L. **Gay**: The pressure of expansibility of normal liquids.—M. **Taffanel**: The combustion of gaseous mixtures and gaseous velocities.—Clément **Berger**: The preparation of aluminium ethylate. Amalgamated aluminium reacts with alcohol in presence of a small quantity of sodium ethylate, and pure aluminium ethylate can be isolated from the resulting solution.—Ch. **Boulanger** and J. **Bardet**: The presence of gallium in commercial aluminium and its separation. The spectrographic examination of commercial aluminium showed strong gallium lines, and a successful attempt was made to isolate gallium from this product. 1·7 kilograms of the metal were dissolved in hydrochloric acid, treated with sulphuretted hydrogen first in hydrochloric acid and then in acetic acid solution, and the product heated with potash solution to remove iron. 0·3895 gram of gallium oxide was obtained, or 0·017 per cent. of metallic gallium on the aluminium taken. The purity of the product was proved spectroscopically.—R. **Bossuet** and L. **Hackspill**: A group of metallic phosphides derived from the hydrogen phosphide P_5H_2. Rubidium phosphide, Rb_2P_5, dissolves readily in liquid ammonia, and this reacts with a solution of lead nitrate in the same solvent, giving the corresponding lead phosphide, PbP_5. Other metals give similar phosphides, but their purification offers great difficulties.—Roger **Douris**: The addition of hydrogen to a secondary alcohol derived from furfurol in presence of nickel. A study of the reduction products of ethylfurfurylcarbinol.—P. **Lemoult**: Leucobases and colouring matters derived from diphenylethylene. The action of the ethyl and methyl magnesium iodides upon Michler's ketone.—Marcel **Mirande**: The existence of a cyanogen compound in *Papaver nudicaule*.—P. **Sisley** and Ch. **Porcher**: The elimination of artificial colouring matters by the lacteal glands. Various harmless dyestuffs (uranine, B-rhodanine, methylene blue, dimethyl-amino-azobenzene) were administered to goats and dogs, both by ingestion and injection. The colouring matters were almost completely arrested by the lacteal glands, little or no colour appearing in the milk.—Em. **Bourquelot**, H. **Hérissey**, and J. **Coirre**: The biochemical synthesis of a sugar of the hexabiose group, gentiobiose.—Sabba **Stefanescu**: The phylogeny of the crown of the molars of mastodons and elephants.

BOOKS RECEIVED.

The Ocean. By Sir John Murray. (Home University Library.) Pp. 256+xii plates. (London: Williams and Norgate.) 1*s*. net.

Higher Algebra. By Dr. W. P. Milne. Pp. xii+586. (London: E Arnold.) 7*s*. 6*d*. net.

Graphical Methods. By Prof. C. Runge. Pp. viii+148. (New York: Columbia University Press; Oxford University Press.) 6*s*. 6*d*. net.

Handbuch der vergleichenden Physiologie. Edited by H. Winterstein. Band iii., 37 Lief. (Jena: G. Fischer.) 5 marks.

The Use of Vegetation for Reclaiming Tidal Lands. By G. O. Case. Pp. iv+36. (London: St. Bride's Press, Ltd.) 2*s*. net.

The Divine Mystery. By A. Upward. Pp. xv+309. (Letchworth: Garden City Press, Ltd.) 10*s*. 6*d*. net.

A Shorter Algebra. By W. M. Baker and A. A. Bourne. Pp. viii+320+lix. (London: G. Bell and Sons, Ltd.) 2*s*. 6*d*.

Bell's Outdoor and Indoor Experimental Arithmetics. First Year's Course. Pp. 31. Second Year's Course. Pp. 32. Third Year's Course. Pp. 39. Fourth Year's Course. Pp. 39. Fifth Year's Course. Pp. 48. (London: G. Bell and Sons, Ltd.) 3*d*. and 4*d*., 3*d*. and 4*d*., 3*d*. and 4*d*., 4*d*. and 6*d*., and 4*d*. and 6*d*. respectively.

Bergens Museums Aarbok 1913. 1 and 2 Heft. (Bergen: J. Griegs Boktrykkeri.)

In the "Once upon a Time." By L. Gask. Pp. 283+plates. (London: G. G. Harrap and Co.) 3*s*. 6*d*. net.

Chemistry, Inorganic and Organic, with Experiments. By C. L. Bloxam. Tenth edition, rewritten and revised by A. G. Bloxam and Dr. S. J. Lewis. Pp. xii+878. (London: J. and A. Churchill.) 21*s*. net.

Die Strudelwürmer (Turbellaria). By Drs. P. Steinmann and E. Bresslau. Pp. xi+380. (Leipzig: Dr. W. Klinkhardt.) 9 marks.

Tintenfische mit besonderer Berücksichtigung von Sepia und Octopus. By Dr. W. T. Meyer. Pp. 148. (Leipzig: Dr. W. Klinkhardt.) 4 marks.