

times of peace in the future. Inevitably connected with the present distribution of gas as fuel, the chief residual, coke, though not valued as it deserves to be, is a useful smokeless fuel, and can be converted into water-gas, and so made use of as a fuel. Ammonia, when fixed by the acid from our sulphur, is of great value as a fertiliser, and is wanted everywhere for the land. Tar yields chiefly pitch, which is also a fuel, but is needed for the repair of our roads. It is also the parent of many useful by-products. In the past it has been almost a drug in the market, chiefly, it is feared, through our own supineness in allowing the recovery processes largely to leave this country, although the country itself is a large buyer of most of the developed products. The sub-products can, for simplicity, be shortly grouped as follows:—There are ten products which, by their energetic combustion, are capable of explosion for war or motor fuel; there are nineteen various colour dyes of great brilliancy; there are nine drugs and antiseptics, among which are saccharine and aspirin; there are eight perfumes and flavourings; there are ten salts of ammonia and cyanogen, and one sulphur for acid-making and fixing ammonia and cyanogen; altogether fifty-seven, and these may be brought out by further permutations into an almost endless number of interesting and probably, in the future, most valuable products. For war purposes the first ten products and the last eleven are especially useful; but I must not tell you how or why, at any rate at present.

Most of these products, such as the drugs and dyes, have sprung into unexpected importance lately, owing to the limitation of imports due to the war. Their manufacture previously had been very largely appropriated by the Germans, who bought the raw products extensively in this country. Now, more wisely, the larger gas undertakings and newly formed British companies are increasing their production at home.

When the full value of these products is realised under peace conditions steps must be taken to prevent—as has long been done in Germany—the inevitable loss of these values where raw coal is burned to destruction, as in ordinary grates and furnaces under steam boilers. To this end there are important inquiries going on into the question of the conservation of coal as a national asset.

With regard to the general question of the destruction of fuel and of meeting other general needs, considering the now universal demand for gas and coke fuel, pitch for roads, benzol for motor transport, and ammonia for the land, to say nothing of the lesser products, it is surely wise to distribute their production where the population exists, and it is clear that the existing supply of gas, as at present arranged, lends itself to that distribution, as the population lies around the works. This will be true also, in a less degree, of even scattered rural populations, as they eagerly avail themselves of gas as a fuel, the distribution of coal being difficult and expensive in such small quantities. Through the extended use of gas already a very large amount of coal has been displaced for domestic and trade use, to the great improvement of the atmosphere and to the cleanliness of buildings.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

LONDON.—The following doctorates have been conferred:—*D.Sc. in Chemistry*: Mr. W. H. Gibson, an internal student, of University College, for a thesis entitled "The Products of Nitration of Toluene." *D.Sc. in Geology*: Mr. C. B. Horwood, an external student, for a thesis entitled "The Gold Deposits of the Rand," and other papers. *D.Sc. in Physiology*: Dr. N. C. Lake, an external student, for a thesis

entitled "Report upon an Investigation into the Effects of Cold upon the Body," and other papers.

By his will the late Dr. Archibald Carmichael, who died in February of last year, has bequeathed the residue of his estate, subject to certain life-rents, to the University of Aberdeen. The value of the residue is estimated at about 12,000*l.*, and the income thereof may be applied "for the advancement of the work of the medical side of the said University in such manner and subject to such regulations, as the Senatus Academicus of the same University may from time to time determine and think fit." The late Dr. Carmichael was a graduate of Aberdeen University.

THE Bureau of Education, India, has issued the seventh of its "Occasional Reports." It deals with the methods of school inspection in England, and is by Mr. H. G. Wyatt, inspector of schools in the Rawalpindi Division. There is much in the volume which will be of practical value in India, where the history of school instruction and of inspection has passed through phases similar to those in England. The respective functions of general and specialist inspectors are explained with considerable clearness, and the author points out that in India, where specialists are already being employed for certain subjects, such as science and handicraft, the chief lessons from the English experience are that the specialist should keep in close contact with the general territorial inspector and consult him in formulating his general recommendations; that he should see something of the general work of the school, and not confine his attention to his special subject. In the particular case of the inspection of secondary schools, Mr. Wyatt urges that the danger of specialist inspections is that they tend to disregard the aims and character of the school as a school, and consider it too much as an aggregate of classrooms. It is satisfactory to find that India has witnessed a revulsion from "grind" and from examination, and that inspection has ceased exclusively to regard the pupil and the results of instruction, and has tended to focus rather on the class and the teacher's methods.

A COPY has been received of an essay by Mr. Fletcher Durell on the "Reform of the Princeton University Curriculum," which was awarded the Philip Le Boutilier prize in February, 1916. Among other subjects discussed is the function of a college. The view generally held, the essay maintains, is that it is the principal aim of the secondary school to train the mind, so that it shall be a good working machine; that the leading function of the college is to have the pupil use his mind after it is thus trained so as to obtain a general world view; and that it is the essential aim of university education, or of other training subsequent to college work, to master some specialty or life-calling. In other words, after the school has laid the foundation, the college is to teach something about everything, and the university everything about something. But the functions of these three periods of education must overlap. During the secondary-school stage the pupil should assimilate large stores of varied information; at college the development of thought-power should continue, and as comprehensive a grasp as possible of the world's affairs should be secured. The American elective system of deciding a student's course of work is examined, and the treatment of the problem at Princeton University explained. The essay then suggests that to assist students in the choice of a faculty each department should work out a concise statement of the vital principles and most representative facts in its domain, and that in drawing up these statements attention should be directed to the efficiency or value aspects of the principles and facts. Princeton should,

Mr. Durell pleads, aim at developing in her sons the broadest scholarship and deepest general culture, and thus safeguard specialism from vagaries and develop it to the highest pitch.

WE have received a report on trade catalogues drawn up by the Technical and Commercial Libraries Committee of the Library Association. The report points out that much information of value to students of science is contained in these catalogues, and that therefore it is desirable that they should be collected and indexed in such a way that students may readily ascertain what new apparatus and inventions have been devised relating to the field of study in which they are working. The Library Association is of opinion that a National Lending Library of books suitable for giving assistance in scientific and industrial research would be of the greatest advantage to technologists. In such a library trade catalogues would hold an important place. It is pointed out that there are peculiar difficulties in indexing trade catalogues. They are seldom dated, and are therefore not easily identified, though the name of the firm by which they are issued can be given. Moreover, they are frequently without any precise description of their contents. The librarian would therefore find it necessary to call in the aid of scientific experts to help in the special indexing required. The report refers to the index to the collection of trade catalogues at the Department of Commercial Intelligence (foreign samples) published by the Board of Trade as an example of an alphabetical subject-index of such catalogues. In view of the special difficulties inherent in collecting and organising the literature of the trade catalogues, and with a view to the widest possible dissemination of the undoubtedly valuable information which these catalogues contain, the committee of the Library Association recommends that proposals be submitted to the leading professional societies and trade journals for the organisation of this class of literature on standardised lines, and possibly for the publication of periodical condensed catalogues of British manufacturing firms.

In proposing his amendment to the Representation of the People Bill, which, as we recorded in our issue for November 15 (vol. c., p. 216), was adopted, giving separate Parliamentary representation with one seat to the University of London, Sir Philip Magnus gave the House of Commons some interesting details of the size and activities of the University. London University consists of a collection of colleges and special schools, about eighty in number, scattered over the County of London. It was founded in the year 1837, and for the past fifty years it has been represented in Parliament. It includes under its ægis three large and important classes of teaching institutions. First, there are the Incorporated Colleges, with endowments and other funds, administered by the Senate of the University. These comprise University College and King's College, each of which is a complete university in itself. The second group of teaching institutions, known as the "Schools of the University," are thirty-three in number, and include the Imperial College of Science and Technology and the School of Oriental Studies, both of which have been established to meet not only national, but also Imperial needs. Somewhat similar in its Imperial character is the School of Economics. But among these thirty-three schools of the University are the eleven medical schools attached to our hospitals, the Royal Holloway College, Bedford College for Women, and other institutions. The third class of teaching institutions, twenty-seven in number, include all our polytechnic schools, the laboratories of which are now rendering valuable help to the Ministry of Munitions. There is also the vast scheme of Uni-

versity Extension Lectures. In the session immediately preceding the war 135 courses of lectures were delivered on philosophy, economics, history, and other subjects, and were attended by 12,902 students. Attached to the University itself are more than 100 professors; and, in addition, there are 1200 recognised teachers; 21,000 members of the University are or have been serving in his Majesty's forces, and of these nearly 700 have already made the supreme sacrifice. At the General Election in December, 1910, the number of graduates who voted at the University of Oxford was 6895, at the University of Cambridge 7145, and at the University of London 6072. The number of graduates, therefore, who voted at the London election was only 823 fewer than those who voted for Oxford, which has the privilege of sending two members to Parliament. The total number of male London graduates is about 11,500.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 22.—Sir J. J. Thomson, president, in the chair.—C. H. Browning and R. Subransen: Bactericidal properties conferred on the blood by intravenous injections of diaminoacridine sulphate. Whereas antiseptic compounds are in general greatly reduced in their bactericidal activity by the presence of serum, it has been found that salts of 3:6-diaminoacridine, both unsubstituted and also various derivatives with methyl groups substituted in the amino-side-chains, or in the benzol-rings, or in both situations, are enhanced in their lethal action on bacteria by the presence of serum; this is also the case with the salt of 3:6-diamino-10-methylacridinium. The sulphate of 3:6-diaminoacridine has been found specially suitable for intravenous injection on account of its low toxicity. By means of an intravenous injection of diaminoacridine sulphate in a dose which had no harmful effect on the treated animal (rabbit), it has been possible to confer antiseptic properties on the blood so that the serum from a specimen of blood withdrawn as late as from two to two and a half hours after the treatment failed to yield a culture when inoculated with *Staphylococcus aureus* or *B. coli*.—W. D. Lang: The Pelmatoporinæ: an essay on the evolution of a group of Cretaceous Polyzoa. The evolution of this sub-family is considered in detail. In order to present the facts intelligibly, they are marshalled according to the following theoretical considerations:—The species lie along diverging lineages; towards the bases or proximal ends of these are forms (radicals) with less calcareous skeletal matter and less elaboration of structure, and these forms appeared earlier in geological time; towards their higher or distal ends are forms with more skeletal matter and more elaborate structure, appearing later in geological time. The evolutionary tendency was to deposit the increasing superfluity of calcium carbonate where it least interfered with the organism's bionomics, if possible in such position and shape as might even be useful to the organism. Sooner or later the race perished through being unable to cope with its constitutional and increasing habit of excessive secretion of calcium carbonate.

Geological Society, November 7.—Dr. Alfred Harker, president, in the chair.—Dr. F. Oswald: The Nimrud crater in Turkish Armenia. The Nimrud volcano, one of the largest craters in the world, is situated on the western shore of Lake Van, and was surveyed geologically for the first time by Dr. Oswald in 1898. The western half of the crater is occupied by a deep fresh-water lake, while the eastern half is composed of recent augite-rhyolites. The crater-wall is highest on