

Oil-Cracking.

A PAPER on "Recent Development in the Art of Cracking," by A. E. Dunstan and R. Pilkethley, was read before the Institution of Petroleum Technologists on October 7. The object of "cracking" is to obtain a lighter constituent from hydrocarbon oils by temperature treatment, under suitable conditions. During the last few years there has been little advance in our knowledge of cracking from the chemical point of view, and most of the problems connected with it have been more of an engineering quality. Very little work has been done on the examination of the residues left after the cracked gasoline has been removed from the synthetic crude oil.

Vapour phase processes working at atmospheric pressure have not been very successful; most of the processes developed worked under 300 to 400 lb. per sq. in. pressure, and no particular advantage in the use of extremely high pressures is apparent. The Bergius process was at first directed towards the production of artificial coal from wood, cellulose, etc., and a black powder containing 84 per cent. of carbon was obtained at 349° under 160 atm. pressure. This was susceptible of hydrogenation by heating to 400° in the presence of hydrogen for some hours, and 70 per cent. of the product was soluble in benzene. In later experiments, natural coal mixed with oil was converted up to a 90 per cent. yield of oil, yielding fractions suitable for use as fuel oil.

The experiments of the present authors throw some doubt on the hydrogenation of the liquid products. Processes for cracking in the vapour phase, *e.g.* the Ramage plant, in which the vapour of the hydrocarbon is passed over heated iron oxide, were described. The Dubbs process is two-stage, the oil being cracked in tubes in the liquid state, then passed to a reaction chamber where carbon is deposited, and the vapours then passed to a dephlegmator which separates heavy oil from lighter cracked vapours. The pressure is about 150 lb. per sq. in., and the process is commercially successful. The Cross process differs from the Dubbs process in the form of the apparatus, and the pressure and temperature conditions.

The Auld, Dunstan and Hering process is described. It is substantially a liquid phase operation throughout, the pressure being sufficiently high to maintain all but the lightest products liquid (25-30 atm.); the yield of light spirit is restricted for definite reasons, the temperature range is definitely fixed for each oil, and the rate of flow is controlled according to the temperature. The oil is first carefully heated to below the optimum temperature, quickly raised above this temperature, and then allowed a certain time of contact in a reaction vessel, where carbon is deposited. The cracked oil is drawn off from the highest point of the vessel, condensed or dephlegmated, and discharged into a gas separator. Experimental plant recently used is also described, and the important problem of refining, including distillation over bauxite or activated carbon, is discussed.

University and Educational Intelligence.

CAMBRIDGE.—Mrs. Marshall, widow of the late Prof. Alfred Marshall, has offered to the university a most valuable selection of books from her husband's library for the use of students in economics, together with 1000*l.* to be used in expenses connected with the books and with any arrangements which may be made for facilitating economic research.

Dr. Dollo has been appointed to represent the university at the fiftieth anniversary of the founding of the *École Polytechnique* of the University of

Brussels. Prof. A. C. Seward has been appointed as a Trustee of the Percy Sladen Memorial Fund. Mr. T. A. Carroll, Sidney Sussex College, has been appointed assistant director of the Solar Physics Observatory in succession to Mr. E. A. Milne, who has resigned on being appointed to the Beyer chair of applied mathematics at the University of Manchester.

At Emmanuel College the following have been elected to Research Studentships: G. A. Reay, University of Aberdeen (biochemistry); W. W. Grave (Romance literature); and P. A. Taylor (mathematics).

CORK.—Applications are invited for the professorship of chemistry at University College. Particulars are to be had from the secretary.

LONDON.—Birkbeck College, which celebrated its centenary last year, announces in its calendar for 1924-25 that great development in accommodation and in facilities for study in the college is probable in the near future. Appended to the calendar is an imposing list of original publications by members of the staff and students, chiefly in chemistry, physics, zoology, geology, classics, and modern languages.

Prof. S. L. Loney has been elected chairman of Convocation, and Sir Josiah Stamp representative on the Senate of the Registered Graduates in Science.

DR. A. T. DE MOUILPIED, of the British Dyestuffs Corporation, has been appointed professor of science at the Royal Military Academy, Woolwich, in succession to Prof. J. Young, as from January 29 next.

APPLICATIONS are invited for the headship of the chemical department of the Midland Agricultural and Dairy College, Sutton Bonington, Loughborough. Particulars of the appointment may be had from the principal.

A LECTURER in agricultural chemistry is required at the Cheshire School of Agriculture, Reaseheath, Nantwich. Applications, upon a prescribed form, must be sent to reach the principal of the school by November 7 at latest.

DR. ALEX HILL, secretary of the Universities Bureau of the British Empire, 50 Russell Square, London, W.C.1, informs us that the six great lines engaged in the passenger service to Australia and New Zealand have agreed to grant eight free first-class return tickets, yearly, to University graduates desirous of studying problems connected with the development of the resources of the Dominions, or of holding temporary teaching posts. The selection of the recipients is to rest with a committee of the Universities Bureau.

THE Senate of the University of Sydney has resolved on the appointment of a chief executive paid officer, with the title of Vice-Chancellor, to take the place of the Warden and Registrar, Mr. H. E. Barff, who has just retired. The necessary legislation is being drafted, and in the meanwhile Prof. MacCallum has been asked to undertake the duties of Warden temporarily. Prof. J. I. Hunter and Dr. N. D. Royle have been invited to deliver the Doctor John B. Murphy oration in surgery at the meeting of the American College of Surgeons to be held in New York on October 20.

THE following candidates have been nominated for election as Parliamentary representatives of the universities of Great Britain and Northern Ireland:—CAMBRIDGE (2)—Mr. James Butler (Ind.), Sir Geoffrey Butler (U.), and Mr. J. F. P. Rawlinson (U.). LONDON (1)—Sir John Rose Bradford (U.), Dr. F. G. Bushnell (Lab.), Dr. E. G. Graham Little (Ind.), and Prof. A. F. Pollard (Lib.). OXFORD (2)—Lord Hugh Cecil

(U.), Prof. Gilbert Murray (Ind.), Sir Charles Oman (U.). SCOTLAND (3)—Sir George Berry (U.), Mr. D. M. Cowan (L.), Sir Henry Craik (U.), Rev. J. M. Munro (Lab.). WALES (1)—Mr. G. M. L. Davies (Lab.), Capt. E. Evans (I.). QUEEN'S, BELFAST (1)—Col. T. Sinclair (U.).

THE Municipal College of Technology, Manchester, announces reductions in fees for degree and certificate courses amounting to 10 per cent. in favour of residents in Lancashire and Cheshire (who were already favoured to the extent of 16 per cent.), and 16 per cent. in favour of students from other parts of the British Empire. According to the Calendar for 1924-25, courses of post-graduation and specialised study and research are offered in mechanical engineering (including hydraulic experimental work, motor-car engineering, and eight other subjects), electrical engineering, municipal and sanitary engineering, applied chemistry (including textile fibres, paper manufacture, metallurgy, india-rubber, brewing, coal-tar and dyestuffs, and photography), textile industries, applied physics, and mining engineering. Last year, ten research scholarships of 100*l.* each were awarded by the College. Among other technical college calendars recently received are those of Loughborough College (departments of mechanical, civil, electrical, automobile, and commercial engineering, pure and applied sciences including chemical technology, extra-mural adult education, and school of industrial and fine art) and the Battersea Polytechnic (engineering, pure and applied mathematics, physics, chemistry and technological chemistry, photography, hygiene and public health, domestic science, and arts and crafts). The subjects of the Polytechnic's technological courses include oil industries, paper industries, and flour-milling.

THE Vice-Chancellor of Oxford has contributed to the October number of the *Empire Review* an article on "Oxford and the Empire." Starting with the great Elizabethans, Sir Humphrey Gilbert of Christ Church, his half-brother Sir Walter Raleigh of Oriel College, and Richard Hakluyt of Christ Church, he gives a list of Oxford men who have during the last four hundred years played distinguished parts in building up the British Empire or the ideas on which it is based, or in its governance. He points out that of the twenty-five governors-general of India from Warren Hastings to Lord Curzon, fourteen were university men; and of these, twelve were educated at Oxford, nine of them at Christ Church. He discusses the features of university life which favour the development of those qualities which go to make good administrators, and deplores the fact that the Indian Civil Service no longer attracts Oxford graduates. Of the Rhodes scholars, he singles out for mention the late Sydney Fairbanks of Rhodesia, who chose an Oxford career especially with the view of developing his own plans of child emigration. The influence on Oxford of Rhodes scholars from the overseas Dominions and the influence of their Oxford training on their subsequent careers is a theme deserving more attention than it has hitherto received. It is to be hoped that the Vice-Chancellor's article may lead to studies of this theme and also of the relations between other universities and the Empire. As Prof. Newton says in his new book, "The Universities and Educational Systems of the Empire," every university is, in a sense, imperial, but the peculiarly imperial university is one that by long prescription, by eminent advantages of situation, and by the labours of a line of great investigators, has acquired prestige and reputation as a *studium generale*.

Early Science at the Royal Society.

October 27, 1670. There was read a Latin letter from Signor Montanari of Bologna, expressing the singular esteem which he had of their institution. —Mr. Oldenburg produced another Latin letter from Erasmus Bartholinus, M.D. of Copenhagen, giving notice of a certain transparent stone, a kind of selenites, sent out of Iceland, and having different positions, a double, quadruple, and sextuple refraction; as also an electric virtue.

October 28, 1663. At a meeting of the Society the president reported to them, that because the stationers and printers are of one and the same company, and may, by the concession of both sides, practise both trades promiscuously, the Society might choose a stationer for their printer without violation to their charter, which gives them power to choose printers. Whereupon Mr. John Martyn and Mr. James Allestry being recommended, it was put to the question, whether it should be the question, that the office of printer to the Royal Society should be conferred jointly; and it was carried in the affirmative; after which those two persons were put to the ballot, and chosen.

1669. Mr. Oldenburg mentioned that Dr. Wren desired to borrow that engine of his, in order to make a scheme and description thereof for the satisfaction of Mons. Huygens, who, though he had much applauded that invention, and the demonstration of it, yet had made some objection against its practicableness.

October 29, 1662. Dr. Wilkins and Dr. Goddard gave an account of the experiment which had been made of a lamp burning under water in a vessel of four gallons, the ellychnium being one single thread of cotton, and the lamp wholly under water: the flame lasted eleven minutes.—They were desired to repeat the experiment several times; as also to try it with some live creatures.

October 30, 1672. An account being demanded of what trials had been made for the improvement of the reflecting telescope of Mr. Newton, Mr. Hooke said, that hitherto he had wanted a mould of a sufficient bigness for a speculum, designed by him of fifteen inches diameter, for a tube of ten feet long; but that he hoped to have, soon, such a mould cast, wherein a speculum of that bigness might be well wrought and polished.

1674. The form of the summons to the Society for returning to their weekly meetings being read again, it was thought fit to omit the names of the persons who were to entertain the Society, and to let it be as follows:—these are to give notice that the Royal Society intends to return to their public meetings on Thursday, being the 12th of this instant November 1674, in Gresham College; at three of the clock; at which time and the following days of their meetings the company will be entertained with experimental exercises, to be performed by several eminent members of the same, in order to a more vigorous prosecution of the ends of their institution.

October 31, 1667. Mr. Evêlyn presented the Society with his wooden tables, having the veins and arteries of the human body fixed on them.—A report being made of Dr. Allen's scrupling to try the experiment of transfusion upon any of the mad people in Bethlehem-hospital, it was ordered that he should be desired by Mr. Hooke to give a meeting at Sir George Ent's house on the Monday following to some of the physicians of the Society, as Sir Theodore de Vaux, Dr. Clarke, Dr. Lower, Dr. Balle, and Dr. King to consider together, how this experiment might be most conveniently and safely tried.