

substance heparin, which is so largely and successfully replacing hirudin in the experimental laboratories of the United States and Great Britain.

With regard to the chemistry of blood, Nicloux (Strasbourg), although unfortunately unable to be present in person, contributed a new spectroscopic method for the determination of small quantities of carbon monoxide in gas mixtures, applying his method to the determination of minimal quantities of it in blood. In a further paper this author presented a new determination of the oxygen content of methæmoglobin, fixing it at half the oxygen content of oxyhæmoglobin of the same blood.

In the present congress demonstrations played what might perhaps be called a secondary part. Many, such as those of Adrian, Kato, and Hill, were in demonstration of communications. Especially interesting in this group was a demonstration by Brinkman (Groningen) of his method of registering the attainment of pH equilibrium in H_2CO_3 -bicarbonate buffer solutions. Barcroft gave a summary of his recent work on the spleen, supplemented by a demonstration. This seems, at last, to find some definite and important physiological function for an organ which has baffled physiological thought for centuries. Lim (Peking) gave a demonstration of a dog with transplanted stomach. Of especial interest also was a demonstration by Y. Henderson (New Haven) of his method of measuring the circulation by inhalation of ethyl iodide. This seems to be the

simplest and most tangible method up to the present, and most probably will find a great future application.

America, as in eleven successive congresses previously, sent a strong contingent of workers, and as was only as fair as it was unanimous, the twelfth congress accepted the invitation of the American Physiological Society that the thirteenth congress be held in America in 1929.

It is, perhaps, of especial interest to mention also the good attendance from Russia, showing that the worst period in that country is approaching an end. Dr. Orbeli (Leningrad), who was present, did not, unfortunately, submit any summary of the results of his experiments upon the sympathetic innervation of voluntary muscle, a problem on which we know him to have been engaged for several years. Prof. I. P. Pavlov, the *doyen* of the congress, showed no sign of diminished activity in spite of his advancing years. There were no communications from his laboratory, although he informs us that a full description of his work on the cerebral cortex is being published in English towards the end of the present year.

The thanks and appreciation of all the members of the congress to their colleagues and hosts in Sweden was expressed by Profs. Gley, von Frey, and Starling at the final meeting of the congress at Upsala, and also previously and more lightly by the same representative speakers at the banquet given to the members of the congress by the City of Stockholm.

The Geological Search for Oil.

ONCE more the ubiquitous problem of the origin of petroleum is forced on our attention, this time as a practical matter rather than as a philosophical thesis. Dr. Murray Stuart writes a paper in the recent issue of the *Journal of the Institution of Petroleum Technologists* in which 'working hypotheses' in the geologist's search for oil form the main theme, the principal argument being that all exploration for petroleum is handicapped at the outset by the fact that little, if anything, is known concerning its origin. We appreciate the laws governing migration and accumulation of oil; we contemplate favourable geologic structures, providing the strata involved are oil-bearing, which are located with remarkable precision; but unless the oil manifests itself by seepage or in some indirect manner, there is little to guide the search. To this extent, it may be noted, the geology of petroleum differs from the geology of, for example, metalliferous ore deposits.

One of the earliest and best known working hypotheses in oil-geology is that attributable to David White, whereby the degree of progressive devolatilisation (or metamorphism) of coal is interpreted as a measure of the chances of obtaining oil or gas in commercial quantity in associated deposits, the percentage of fixed carbon (pure coal basis) being the determining factor. White's law has found ample vindication in the West Virginia oil-fields, but it is not of universal application, as pointed out by Wade in a recent paper on "The Search for Oil in Australia"; the author, however, seeks to amend the law to the extent of excluding the idea of subsequent 'metamorphism' in favour of carbon ratio variation being interpretable in terms of normal processes of sedimentary deposition. He visualises his carbonaceous material as part of a sheet of sediment in which transition from conglomerate "... through sand and shale to oil-bearing shale, ... through something equivalent to Torbanite into more or less pure carbonaceous material ..." is perceptible; carbon

ratio variations are thus functions of original influences (mother-substance, environment, etc.), not of subsequent change in the course of geologic time. From this point of view is deduced the hypothesis that, assuming the carbon ratio of a fresh-water or estuarine coal seam to be favourable (*i.e.* 50 to 55), the seam will probably pass through torbanite into oil shale when traced in the direction from which the material composing the seam was initially derived. In the case of coals deposited under marine conditions, lateral variation into petroleum or into oil-shale (depending on the nature of the organic material incorporated in the sediment) is probable. A further hypothesis states that "... when formations containing abundant fossil-wood occur the underlying marine formations may contain liquid petroleum," and has been reasoned by the author in previously published papers.

The occurrence of oil in dolomitised limestones of lagoon formation furnishes the author with a contrasted, though in some respects parallel, line of argument; he examines this environment from a biochemical point of view, directing attention to the rôle of foraminifera and other protozoa, and also bacteria, in promoting essential mother-substance, whence he formulates the hypothesis that "all dolomitised limestones of lagoon formation are worthy of thorough investigation, provided that they prove, on microscopic examination, to be foraminiferal."

What we may term the 'coal-to-conglomerate' hypothesis of the author raises problems at least as controversial as those of the origin of petroleum itself, though there is considerable novelty, if not practical import, in the views he puts forward. For the "many examples known in the world of coal seams and lignite seams passing laterally into either oil-shales or oil deposits" there are as many in which no coal-oil association is apparent. The tracing of a coal seam into an oil-shale seam in existing economic circumstances would be little reward to the geologist

bent on locating commercial oil-pools; but the chances of lateral variation from coal to petroleum would seem, according to the author's reasoning, to be somewhat localised. On the other hand, where coal, lignite, or torbanite is in evidence in deposits suspected or proved to contain oil, the hypothesis clearly merits the test: only by this method and in several different cases will its validity, hence its practical value, be established.

University and Educational Intelligence.

CAMBRIDGE.—The John Winbolt Prize has been awarded to H. Bateman, Trinity College, and R. J. Smith, St. John's College, for a joint dissertation on a theoretical investigation of some elastic problems in thin rectangular plates.

EDINBURGH.—In the Royal Botanic Garden, on Tuesday, September 21, the Right Hon. Sir Herbert Maxwell unveiled a tablet to the memory of the late Sir Isaac Bayley Balfour, who was Regius Keeper of the Garden from 1888 until 1922.

THE Wigan and District Mining and Technical College sends us a Calendar giving, in 142 pages, particulars of courses, some of them leading up to the final degree examinations of the University of London, in mining, mechanical and electrical engineering, chemistry, physics, mathematics, building trades, cotton technology, commerce, art, and art crafts. In 1925 six students obtained University of London degrees. Among other specialities is a two-years' Post Office engineering course.

THE London School of Economics and Political Science announces in its summary programme for 1926-27 a series of important public lectures by eminent authorities, open to the public without fee or ticket. These include, in addition to single lectures by Profs. Laski and de Paula and Mr. William Cash, a series of three by Prof. Toynbee on international history since the War, six by Prof. Salvemini on Italian communes in the thirteenth century, ten on office machinery, and twelve on accounting in public offices.

THE Battersea Polytechnic's prospectuses for 1926-27 offer full day and evening courses in preparation for the University of London's intermediate and final degree examinations in science, engineering, and music. In consultation with the Incorporated National Association of British and Irish Millers, the London Flour Millers' Association, and the Board of Education, a two-year day course in science and engineering with special reference to the flour milling industry has been organised. Courses for health visitors and sanitary inspectors and in arts and crafts are provided. A separate prospectus deals with the Polytechnic's Domestic Science Training College. Another of London's Technical Colleges from which we have lately received a prospectus is the Cordwainers'. This provides both day and evening courses in the technology of boot and shoe manufacture and leather goods manufacture.

THE East London College announces in its calendar for 1926-27 the institution of a fund for the encouragement of original investigation by the staff and students, and an important addition to its resources for such purposes in the form of a bequest by the late Sir Sidney Lee of 5000*l.* for bursaries for post-graduation work in English literature. Three research studentships of the value of 50*l.* each for one year are awardable annually in July to students completing a three-years' course at the College. Special

and advanced lectures announced include: a course of six on short electric waves in wireless, by J. H. Morrell, and six (for graduates) on biology of freshwater algæ, by Prof. Fritch and Dr. Carter. In its recently constituted department of dramatic study and research there will be a weekly seminar for collective work on a dictionary of British drama. In aeronautical engineering a three-years' course is arranged, and students attending the last two years of this are able to take aeronautics instead of hydraulics in the new subject, 'Mechanics of Fluids,' in the B.Sc. (Engineering) degree examination. The College Council has recently purchased the freehold of a house in South Woodford for use as a hall of residence for men students. One for women students on the borders of Epping Forest with accommodation for thirty-two has already been opened.

THE Northern Polytechnic, Holloway (formerly Northern Polytechnic Institute), gives, in its prospectus for 1926-27, particulars of its important Department of Chemistry and Rubber Technology. It is the only institution listed under the heading of rubber technology in the Universities Bureau's summary of specialist studies in the universities and university colleges of Great Britain and Ireland. The courses are carried on in collaboration with the Institution of the Rubber Industry and provide suitable preparation for students proposing to enter for the examinations for the associate diplomas (A.I.R.I.) awarded by that body. An influential committee, representative of all sections of the industry, co-operates with the governors, and the workshops contain a full range of modern experimental rubber-plant. In addition to the advanced courses there is a Rubber Trades School, for boys of 14 or 15 years of age. The technical chemistry three-years' courses are designed for prospective analytical and works chemists. They include chemical technology, glass-working, chemical engineering, and (a two-years' course) plumbing. A series of important special public lectures have been arranged for the coming session, beginning with one by Raymond Unwin on October 14 on town planning.

THE Municipal College of Technology, Manchester, has resumed publication of its *Journal*. Volume 12, just issued, records investigations undertaken by members of the College between 1919 and 1924. It contains original articles on: losses in resistance connectors in single-phase commutating motors (Miles Walker), the discharging capacity of side weirs (G. S. Coleman and Dempster Smith), the aromatic character of the glyoxaline nucleus (F. L. Pyman), ferrous materials and corrosion (E. L. Rhead), values of the smallest zeros of harmonic functions (J. Prescott and H. V. Lowry), a null method for ionisation potentials (L. S. Palmer and W. Hubball), and a direct-reading refractometer (A. Adamson). The prospectus of the College for 1926-27 shows that since 1919-20 from ten to thirteen research scholarships have been awarded by it each year. The scholarships are open to graduates of any university in the British Empire and other persons possessing special qualifications for research. In awarding three of them, preference is given to Manchester ratepayers and their sons and daughters. Courses of advanced study and research are offered in mechanical, electrical, municipal, and sanitary engineering (including sea outfall and coast defence works), applied chemistry (including textile fibres, paper manufacture, metallurgy, rubber, brewing and allied industries, coal tar and dyestuffs, photography and photographic processes), textile industries, applied physics, and mining engineering.