

into the works as a result of the installation of a small plant in the Bournemouth gasworks. In the initial stages a semi-coke, heated to 600° C., was treated with hydrogen under 50 atmospheres pressure. Under these conditions, gasification partly by liberation of volatile matter and partly by reaction of hydrogen with carbon takes place with great rapidity, for the formation of methane is an exothermic reaction. Another approach to the production of methane from coal is the synthesis from mixtures of carbon monoxide and hydrogen. Synthesis of liquid hydrocarbons is better known, but by choice of catalyst and conditions methane can also be obtained. The most important of the conditions is the almost complete removal of organic sulphur from the gas by processes which require very stable catalysts. Results of high promise have been obtained and suggest that fuel gas may soon be distributed almost free from sulphur.

All this work aims at the preparation of a fuel gas without the limitation of starting from high-class coking coal, rather indeed from any coal. This achievement will almost certainly be accompanied by the production of gas from sulphur.

In recent years it has been recognized that although heat is transferred by convection and radiation, the differentiation of the two may be important. In certain operations, especially those involving drying, radiation may prove more effective than convection. Effectiveness may be influenced by the quality not only of the source of radiation but also by that of the surface receiving the radiation. The report shows that the Gas Research Board is actively engaged in this field because gas-heated surfaces are specially effective for radiant heating, and this promises great industrial application.

Another branch of the Board's activities involves the separation by refrigeration of coal gas into its constituent gases, whereby advantage can be gained from the special properties of each.

The report shows that the Board, in spite of wartime difficulties, is making rapid progress in the development of new techniques for the manufacture and use of gaseous fuel.

FREQUENCY OF EARTHQUAKES IN CALIFORNIA

ACCORDING to Gutenberg and Richter, the southern California area, including the Owens Valley, has about one half of one per cent of the seismic activity of the globe ("Frequency of Earthquakes in California." By B. Gutenberg and C. F. Richter. *Bull. Seis. Soc. Amer.*, 34, No. 4, 185; 1944). This conclusion is arrived at by considering statistically up-to-date information concerning earthquakes, employing the instrumental magnitude scale.

The magnitude M of an earthquake was originally defined as proportional to the logarithm of the maximum trace amplitude on the seismogram of a standard torsion seismometer distant 100 km. from the epicentre, and having a normal shallow depth. The magnitude scale is chosen to make $M = 0$ correspond to the smallest instrumentally recorded shocks. It is found that $M = 2$ corresponds to the smallest shocks ordinarily reported felt, $M = 4.5$ causes slight damage, $M = 6$ earthquakes are moderately destructive, and $M = 8.5$ corresponds to the largest recorded shocks.

Since 1921, the following shocks in the California-Nevada region have had magnitude 7 or greater: Jan. 31, 1922 (7.3), off the north coast; Jan. 22, 1923 (7.1), off the north coast; Nov. 4, 1927 (7.0), off Point Arguello; Dec. 20, 1932 (7.3), west-central Nevada; Dec. 31, 1934 (7.0), south of the Imperial Valley. In the present century, two shocks in the same region have exceeded magnitude 7.5: April 18, 1906 (8.25), central California; Oct. 2, 1915 (7.75), north-central Nevada.

This gives the California-Nevada region about 90 per cent of the seismic activity of the United States.

According to the authors, the expected occurrence of about four great earthquakes per century in the California region by no means excludes the possibility that double that number might occur in a given century, or that a whole century might pass without even one. Further, the events are not strictly independent. A great shock, such as that of 1906, represents a regional release of strain; after the immediate aftershocks have subsided, it may be expected to be followed by a period of abnormal quiet, as is probably now the condition in central California. It is worth noting that great shocks are to be looked for only in association with the major active faults and structures, such as the San Andreas fault zone and the trough of the Owens Valley. The other faults and active structures are characterized at most by moderately destructive earthquakes like those at Santa Barbara and Long Beach.

THE STONE AGE IN EAST AFRICA

IMMEDIATELY before the War, industries belonging to a so-called Tumbian culture were being recognized at many sites in eastern and western Africa. First noticed by Dr. X. Stainer in the Congo, industries of similar types were soon being identified in many other areas. Dr. Menghin and T. P. O'Brien (in his book on the prehistory of Uganda) went so far as to suggest that the Tumbian culture was derived directly from that of the *coups de poing* makers, that it could be described as a sort of Acheulean gone to seed. Prof. H. Breuil, however, in a recent study of Dr. Cabu's finds, denies the existence of the Tumbian as a distinct culture, and he and Prof. van Riet Lowe suggest that the industries represent only a variation of the Sangoan culture of Uganda with strong Fauresmith affinities (*Trans. Roy. Soc. of South Africa*, 30, pt. ii; 1944).

Dr. Leakey and Archdeacon Owen have now entered the ring, and in the first Occasional Paper of the Coryndon Memorial Museum, entitled "A Contribution to the Study of the Tumbian Culture in East Africa", they unequivocally uphold its status as a culture. Owen and Leakey's publication deals mainly with a series of sites, chiefly from the Kavirondo area, where industries belonging to various stages of this debatable culture have been discovered. There are several pages of illustrations. In conclusion, there is a general discussion on certain aspects of the Stone Age in Kenya, followed by an appendix, where Breuil and Lowe's work, quoted above, is cited, and the conclusions there set out denied.

As a personal opinion I can only add that every so-called Tumbian assemblage of implements which I have seen has appeared to contain several elements and to have been a mixture of the relics of more than

one culture. Certain types do certainly seem to be derived from a *coup-de-poing* prototype. There is no reason to deny the possibility of a late survival of the early palaeolithic cultures in parts of Africa where the sharp division lines resulting from the several glacial maxima are absent. That a part of the so-called Tumbian is, as the authors claim, something new to us and derivative from the Acheulean would seem to be quite possible; but that the industries discussed contain elements from other cultures and that therefore a pure Tumbian industry has yet to be isolated is also more than likely.

M. C. BURKITT.

FORTHCOMING EVENTS

Saturday, September 22

BRITISH PSYCHOLOGICAL SOCIETY (at Tavistock House, Tavistock Square, London, W.C.1), at 2.30 p.m.—Mr. E. G. Chambers: "Statistical Psychology, a Plea for Scientific Method"; Mr. Ranyard West: "The Contribution of Psychology to Politics".

Monday, September 24

ASSOCIATION OF AUSTRIAN ENGINEERS, CHEMISTS AND SCIENTIFIC WORKERS IN GREAT BRITAIN (at the Austrian Centre, Swiss Cottage, 69 Greencroft Gardens, London, N.W.6), at 7.30 p.m.—Dr. M. D. H. Strauss: "The Physical Basis of the Atom Bomb."

Tuesday, September 25

ROYAL PHOTOGRAPHIC SOCIETY, SCIENTIFIC AND TECHNICAL GROUP (at 16 Prince's Gate, London, S.W.7), at 6 p.m.—Dr. G. B. Harrison: "How it Works in Photography", No. 1: "The Light and Shade of Image Formation".

QUEKETT MICROSCOPICAL CLUB (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 7 p.m.—Conversation and the Exhibition of Specimens.

Thursday, September 27—Friday, September 28

FARADAY SOCIETY (at University College, Gower Street, London, W.C.1).—General Discussion on "Oxidation".
Thursday, September 27, at 11 a.m.
Friday, September 28, at 10.30 a.m.

Friday, September 28

BIOCHEMICAL SOCIETY (in the Human Nutrition Research Unit of the Medical Research Council, National Hospital for Diseases of the Nervous System, Queen Square, London, W.C.1), at 11 a.m.—Scientific Papers and Demonstrations.

PHYSICAL SOCIETY, OPTICAL GROUP (Department of Physics, Imperial College, London, S.W.7), at 3.15 p.m.—Mr. E. Wilfred Taylor: "Evolution of the Dividing Engine"; at 5 p.m.—a film entitled "Motion-picture Records of the Whole Sky" will be shown.

INSTITUTE OF WELDING, EAST SCOTLAND BRANCH (at the Heriot-Watt College, Chambers Street, Edinburgh), at 7.30 p.m.—Mr. A. Stephenson and Mr. D. Llewellyn: "Welding: Past, Present and Future".

APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

AGRICULTURAL ASSISTANT EDUCATION OFFICER—The Chief Education Officer, County Education Office, Stracey Road, Norwich, endorsed "Agricultural Assistant Education Officer" (September 29).

SENIOR ENGINEERING ASSISTANT—The Surveyor, Hebburn Urban District Council Offices, Argyle Street, Hebburn (September 29).

LABORATORY TECHNICIAN—The Medical Superintendent, Birmingham Mental Hospital, Winson Green, Birmingham (October 1).

CHAIR OF CHEMICAL ENGINEERING tenable at the Imperial College of Science and Technology.—The Academic Registrar, University of London, Richmond College, Richmond, Surrey (October 3).

ENGINEERS (temporary staff) by the Government of Nigeria for the Public Works Department—The Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, quoting E.1899.A (October 5).

LECTURER IN ENGINEERING SUBJECTS in the Royal Aircraft Establishment Technical School, Farnborough, Hants.—The Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, quoting C.2641.A (October 5).

SUPERINTENDENT (with qualifications in chemical technology and chemical engineering research applied to explosives) in a Government Research Establishment—The Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, quoting F.3886.A (October 5).

GEOLOGIST by the Government of Iraq—The Ministry of Labour and National Service, A.9, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, quoting F.4826.A (October 5).

PHYSICISTS (2) for a Petroleum Research Station near London—The Ministry of Labour and National Service, Appointments Department, Technical and Scientific Register, Room 670, York House, Kingsway, London, W.C.2, quoting A.1023/4.XA (October 6).

LECTURER IN CHEMICAL ENGINEERING in the Department of Oil Engineering and Refining—The Secretary, The University, Edmund Street, Birmingham 3 (October 8).

TECHNICAL ASSISTANT (Chemist) in the Sewage Disposal Department—The Town Clerk, Guildhall, Nottingham (October 15).

ASSISTANT LECTURER AND DEMONSTRATOR IN BOTANY—The Secretary, West of Scotland Agricultural College, 6 Blythwood Square, Glasgow, C.2 (October 21).

THIRD LECTURER IN BACTERIOLOGY AND ASSISTANT BACTERIOLOGIST in the Public Health Laboratory—The Secretary, The University, Birmingham, 3 (October 31).

READERSHIP IN PUBLIC HEALTH tenable at the London School of Hygiene and Tropical Medicine—The Academic Registrar, University of London, Richmond College, Richmond, Surrey (January 1).

SENIOR SCIENCE MASTER in the King Edward VII School—The Director of Education, Education Office, Leopold Street, Sheffield, 1.

UNIVERSITY ASSISTANT IN THE DEPARTMENT OF NATURAL HISTORY in the United College, St. Andrews—The Secretary, The University, St. Andrews.

LABORATORY ASSISTANT IN THE DIVISION OF HISTOLOGY—The Bursar, Royal Veterinary College, Camden Town, London, N.W.1.

TECHNICAL ADVISORY OFFICER—The Executive Officer, Shropshire War Agricultural Executive Committee, County Buildings, Shrewsbury.

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

Colonial Research, 1944-45. 1. Colonial Research Committee, Second Annual Report; 2. Colonial Products Research Council, Second Annual Report; 3. Colonial Social Science Research Council, First Annual Report. (Cmd. 6663.) Pp. 32. (London: H.M. Stationery Office, 1945.) 6d. net. [238]

The British Radio Industry in War and Peace. Pp. ii+26. (London: Radio Industry Council, 1945.) [238]

British Electrical and Allied Industries Research Association. Technical Report (Reference Y: T6): Capacity Current Heating—Résumé of Published Information. By T. H. Messenger and D. V. Onslow. Pp. 20+2 plates. (London: British Electrical and Allied Industries Research Association, 1945.) 9s. [238]

Imperial Bureau of Horticulture and Plantation Crops. Technical Communication No. 16: Further Work on Plant Injection for Diagnostic and Curative Purposes. By W. A. Roach and W. O. Roberts. Pp. ii+12. (East Malling: Imperial Bureau of Horticulture and Plantation Crops, 1945.) 1s. 6d. [238]

Ovaltine Research Laboratories. Annual Report, 1944. Pp. 6. (London: A. Wander, Ltd., 1945.) [238]

Other Countries

Commonwealth of Australia: Council for Scientific and Industrial Research. Bulletin No. 184: Fellmongering Investigations, Papers 1-12. By F. G. Lennox, Margaret E. Maxwell and W. J. Ellis. Pp. 232+8 plates. (Melbourne: Government Printer, 1945.) [317]

Smithsonian Miscellaneous Collections. Vol. 104, No. 11: The West Atlantic Boring Mollusks of the Genus *Martesia*. By Paul Bartsch and Harald A. Rehder. (Publication 3804.) Pp. ii+16+3 plates. Vol. 104, No. 12: The Solar Constant and Sunspot Numbers. By L. B. Aldrich. (Publication 3806.) Pp. ii+6. (Washington, D.C.: Smithsonian Institution, 1945.) [18]

Preliminary Report on the Third Gujarat Prehistoric Expedition, by H. D. Sankalia and I. Karvé; and Human Remains Discovered So Far, by I. Karvé and G. M. Kurulkar. Pp. 16+9 plates. (Bombay: Times of India Press, 1945.) 6.8 rupees. [18]

Indian Forest Records (New Series). Utilization, Vol. 3, No. 4: The Testing of Indian Plywood Tea Chests, and Suggestions for Establishing a Standard Type. By V. D. Limaye. Pp. 10+4 plates. (Dehra Dun: Forest Research Institute, 1945.) 9 annas. [18]

Proceedings of the United States National Museum. Vol. 96, No. 3190: The Genus *Fundella* Zeller; a Contribution toward a Revision of the American Pyralidoid Moths of the Family Pycnophoridae. By Carl Heinrich. Pp. 105-114+plates 4-6. (Washington, D.C.: Government Printing Office, 1945.) [18]

Forty-seventh Annual Report of the Carnegie Museum for the Year ended December 31, 1944. Pp. 37. (Pittsburgh: Carnegie Institute, 1944.) [18]

Anglo-American Caribbean Commission: Committee on Agriculture, Nutrition, Fisheries and Forestry of the Caribbean Research. Fisheries Series, No. 2: Fresh and Brackish Water Fish Culture. Pp. ii+32. (Washington, D.C.: Anglo-American Caribbean Commission, 1945.) [18]

New South Wales: Department of Mines, Geological Survey. Mineral Resources, No. 38: Part 1. The Gulgong Gold Field, by Leo J. Jones; Part 2. Magnetic Prospecting of the Gulgong Deep Leads, by J. M. Rayner. Pp. 168+5 plates. 9s. Mineral Resources, No. 39: Geology and Underground Water Resources of the East Darling District. By C. St. J. Mulholland. Pp. iii+80+3 plates. 6s. (Sydney: Government Printer, 1940.) [93]

Catalogues

50 Years of Scientific Instrument Manufacture. Pp. 28. (London: Cambridge Instrument Co., Ltd., 1945.)

The Use of Cacodylates. Pp. 4. (London: R. F. Reed, Ltd., Barking, 1945.)

A Catalogue of Books, Old and Modern, in various Departments of Literature. (No. 498.) Pp. 38. (Cambridge: Bowes and Bowes, 1945.)