

tion are shown by Marconi Instruments, Ltd., and The Accurate Recording Instruments Co.

Having dwelt at some length on only two of the exhibits may give the impression that there is little else to be seen. This is not so. The pictorial prints, lantern slides and stereoscopic transparencies are themselves worth a visit and can be relied upon to provide agreeable relaxation.

A SURVEY OF CANADIAN SCHOOLCHILDREN

THE statistical results of a survey of children in the elementary schools of the city of Toronto, taken in November 1939, have recently been published*. It is a team work in which the Hospital for Sick Children in Toronto, the Department of Pensions and National Health, Ottawa, the Education Statistics Branch of the Dominion Bureau of Statistics, and the Toronto Board of Education participated. The whole report is the work of Mr. N. Keyfitz and his assistants of the Social Analysis Branch of the Dominion Bureau of Statistics.

In 1923 the Department of Public Health in Toronto made a survey of 59,000 elementary pupils, from which a table of average heights and weights by age was calculated and which became the standard for Canadian school-children. During the intervening sixteen years it was found that, as a result of the policy of social improvement based on the previous findings, pupils in the various age-groups were outgrowing their categories, and it was decided to institute a new survey in which medical investigation would be as thorough as possible and the correction of physical defects would be a major aim.

In the present study of 78,000 children, equally divided on the basis of sex, emphasis is laid on the influence of such factors as economic status, birth-place of parents and the range within which nutrition affects the build of children. An effort is made throughout to determine the relative importance of the following points: (1) Does the economic status of the family influence the prevalence of disease and defect? (2) Does it retard the child in his academic standing as indicated by his school grade? (3) Do certain combinations of defects or diseases have more effect on the height and weight than the same defects and diseases unassociated? (4) How does heredity as shown by parental birth-place affect build?

The pupils of 1939 are found to be taller for their age than similar groups of 1923, except the six-year-olds. This may be explained by the fact that it is now customary to enter children at school at six, while formerly less robust six-year-olds were kept at home. Girls are found to mature earlier than boys; but thirteen-year-olds of the latter are found to mature at two different rates, as shown by a bimodal distribution representing maxima in height and weight combined.

An interesting comparison between the Toronto survey and Sir Frederick Menzies's London survey of 1938 is made. Canadian children, as one would expect, are taller than English ones. The London children of 1938 approximate in height and weight

the 1923 levels of Toronto. However, the differences between the well-to-do and poorer metropolitan boroughs show the same tendencies as the Toronto ones, the differences being, if anything, less marked in England. A similar extensive study by the U.S. Department of Agriculture (Garment and Pattern Construction) in 1941 of 147,000 white schoolchildren of 4-17 years of age is remarkably close to the Canadian figures.

Economic status of parents: It is found that unskilled labourers and unemployed parents have children who are under-height; but there is striking absence of differences in build, that is, weight in relation to height, between children from poor and prosperous districts.

Diseases and defects: Diseases have no appreciable effects on height and weight, but defects tend to make their owners shorter and lighter for their height, that is, thinner.

Heredity: Children of United States-born parents are taller, and those of British-born parents are lighter than those of Canadian-born parents. Inter-racial marriage tends to increase the height of offspring. Children whose parents are eastern European-born are taller and those whose parents are of western European birth are shorter and heavier.

It is, of course, well known that foreign-born immigrants tend to be in less skilled occupations, while United States-born are often in a higher economic level than the Canadian-born.

The work is lavishly illustrated with charts and tables but one feels, after all is said, that fewer tables and a more detailed discussion of the biological principles governing growth would make this excellent booklet more valuable and instructive. Nevertheless, in these days when the very basis of science is being challenged, and men of science are everywhere engaged on the destructive aspects of their calling, it is refreshing to come across a progressive little book of the type, at once creative and far-sighted.

R. E. G. ARMATTOE.

RADIO DETECTION AND RANGING

'RADAR', the code name for radio detecting and ranging, has been officially revealed to be one of the foremost scientific developments of the War, according to a statement issued by the Western Electric Co. (*Bell Lab. Rec.*, 21, No. 10; June 1943). An electronic instrument projects a beam of radio impulses, and these impulses reveal the presence of distant objects by rebounding to the observer. When trained on enemy aeroplanes, still so distant as to be beyond the reach of anti-aircraft guns, 'radar' reports their presence. The system is, of course, unaffected by darkness, clouds or fog.

Under the name of radiolocation the method was credited by Lord Beaverbrook with winning the Battle of Britain. In the South Pacific, according to the article in the *Bell Laboratories Record*, it has been responsible for enemy losses of millions of dollars' worth of ships, aeroplanes and submarines. Radar was developed on the basis of years of research and experiment in electronics, independently in the United States and Great Britain, and credit for the development must be shared by many of the foremost scientific men of the two nations.

The fact that radio waves can be reflected just as

* A Height and Weight Survey of Toronto Elementary School Children, 1939. Pp. 36. Published by authority of the Hon. James A. MacKinnon, M.P., Minister of Trade and Commerce. (Ottawa, 1942.) 25 cents.

can light and sound waves had long been known and the phenomenon had been used, for example, to measure the electrical reflecting surface in the ionosphere. Only with the advent of the ultra-short radio waves in the early 1930's did it become possible to observe reflexions from objects so small as an aeroplane. In 1932, it was noticed that an aeroplane flying about 1,500 ft. overhead produced a noticeable 'flutter' of about four cycles per second. In 1938 the absolute altimeter was introduced commercially for use in aircraft. This instrument employed the principle of directing radio waves against the ground and timing their return to give the exact height of an aircraft above the earth. In the same year, in the United States, a series of experiments at 15th Street in Brooklyn overlooking the Narrows leading into Manhattan's upper bay was made, using a modification of the absolute altimeter enclosed in a hornlike directional antenna system of galvanized sheet, and it was observed that radio waves directed against ships passing through the Narrows were thrown back into the receivers.

With the formation in the United States of the National Defense Research Committee, 'radar' became one of the most active lines of investigation by a large group of scientific workers. A mission of British men of science to the United States made a complete disclosure of the status of their art, with reciprocal disclosures by the N.D.R.C. group. Still in limited use in the U.S. Armed Forces when the United States entered the War, 'radar' is now standard equipment for both American Army and Navy. An official statement says of it, "radar is used by static ground defences to provide data for anti-aircraft guns for use in smashing Axis planes through cloud cover, and by airplanes and warships".

FORTHCOMING EVENTS

(Meeting marked with an asterisk * is open to the public.)

Saturday, October 2

ASSOCIATION OF SCIENTIFIC WORKERS (at Essex Hall, Essex Street, Strand, London, W.C.2), at 2.30 p.m.—Conference on "Problems of Freed Europe—The Challenge to the Medical Sciences". Problems of the Occupied Territories: Belgium (Dr. A. Marteau); Czechoslovakia (Dr. V. Kruta); Greece (Dr. A. P. Cawadias); U.S.S.R. (Prof. S. A. Sarkisov); Present Plans for Relief (Prof. J. R. Marrack).

GEOLOGISTS' ASSOCIATION (at Geological Society, Burlington House, London, W.1), at 2.30 p.m.—G. S. Sweeting: "Wealden Iron Ore and the History of its Industry".

Monday, October 4

SOCIETY OF CHEMICAL INDUSTRY (LONDON SECTION) (at the Chemical Society, Burlington House, Piccadilly, London, W.1), at 2.30 p.m.—Mr. S. J. Johnstone: "The Organisation and Use of Technical Intelligence Services".

Tuesday, October 5

ROYAL ANTHROPOLOGICAL INSTITUTE (at 21 Bedford Square, London, W.C.1), at 1.30 p.m.—Dr. Margaret Mead: "Modern Anthropology".

CHADWICK PUBLIC LECTURE (at the Royal Society of Tropical Medicine and Hygiene, 26 Portland Place, London, W.1), at 2.30 p.m.—Mr. E. J. Boome: "Muscular and Mental Relaxation in Peace and War".*

SOCIETY FOR THE STUDY OF INEBRIETY (in the Meyerstein Lecture Hall, Westminster Hospital Medical School, Horseferry Road, London, S.W.1), at 4 p.m.—Dr. A. Ninian Bruce: "Alcohol and Avitaminosis" (Nineteenth Norman Kerr Memorial Lecture).

SOCIETY OF CHEMICAL INDUSTRY (MANCHESTER SECTION) (Joint Meeting with the MANCHESTER LITERARY AND PHILOSOPHICAL SOCIETY) (in Room 7, The University, Oxford Road, Manchester), at 5.30 p.m.—Sir John Russell, F.R.S.: "Agricultural Reconstruction in Europe after the War".

Thursday, October 7

Institution of Electrical Engineers (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Colonel Sir A. Stanley Angwin: Presidential Address.

Friday, October 8

ROYAL ASTRONOMICAL SOCIETY (at Burlington House, Piccadilly, London, W.1), at 4.30 p.m.—Mr. H. W. Newton: "Solar Flares and Magnetic Storms".

Saturday, October 9

SHEFFIELD METALLURGICAL ASSOCIATION (Joint Meeting with the MICROCHEMICAL SECTION OF THE SOCIETY OF PUBLIC ANALYSTS and the SOUTH YORKSHIRE SECTION OF THE ROYAL INSTITUTE OF CHEMISTRY) (in the Department of Applied Science, The University, St. George's Square, Sheffield), at 2.30 p.m.—Symposium on "Microchemical Analysis".

APPOINTMENTS VACANT

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

CHAIR OF SOCIAL MEDICINE—The Secretary, The University, Edmund Street, Birmingham 3 (March 1).

UNIVERSITY LECTURER IN ANTHROPOLOGY—The Secretary of the Appointments Committee of the Faculty of Archaeology and Anthropology, Museum of Archaeology and of Ethnology, Cambridge (April 15).

HEAD OF THE DEPARTMENT OF DYEING in the Bradford Technical College—The Director of Education, Town Hall, Bradford (October 9).

LECTURER IN PHYSIOLOGY AND ZOOLOGY—The Registrar, Technical College, Sunderland (October 9).

LECTURER (WOMAN) IN BIOLOGY in the Department of Pharmacy and Biology—The Principal, Central Technical College, Suffolk Street, Birmingham 1 (October 9).

EDUCATIONAL PSYCHOLOGIST—The Chief Education Officer, Education Office, Warrior Square, Southend-on-Sea (October 11).

RESEARCH HISTOLOGIST (NON-MEDICAL) in the Pathological Department—The Secretary, Royal Cancer (Free) Hospital, Fulham Road, London, S.W.3 (October 13).

TEACHER OF MATHEMATICS AND PHYSICS in the Junior Technical School and Senior part-time Classes of the Batley Technical College—The Director of Education, Education Offices, Batley, Yorkshire (October 15).

ASSISTANT ELECTRICAL ENGINEER for the Nigerian Government Public Works Department—The Secretary, Overseas Manpower Committee (Reference No. 538), Ministry of Labour and National Service, Alexandra House, Kingsway, London, W.C.2.

ASSISTANT MECHANICAL ENGINEER for the ELECTRICAL BRANCH of the Nigerian Government Public Works Department—The Secretary, Overseas Manpower Committee (Reference No. 1076), Ministry of Labour and National Service, Alexandra House, Kingsway, London, W.C.2.

MECHANICAL AND ELECTRICAL ENGINEER for the Gold Coast Government Public Works Department—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, "D" Section, D.588X, Alexandra House, Kingsway, London, W.C.2.

ENGINEER AND MANAGER of the Inverness Corporation Electricity Department—The Town Clerk, Town House, Inverness (October 11).

ASSISTANT MASTER TO TEACH SCIENCE, with an Engineering bias, and PRACTICAL MATHEMATICS, in the Forest of Dean Mining and Technical School and East Dean Grammar School—The Secretary, County Education Office, Shire Hall, Gloucester.

REPORTS and other PUBLICATIONS

(not included in the monthly Books Supplement)

Great Britain and Ireland

Proceedings of the Royal Society of Edinburgh. Section B (Biology). Vol. 61, Part 4, No. 30: Study of an Introduced North American Freshwater Mollusc, *Stagnicola catascopium* (Say). By D. Keith McE. Kevan. Pp. 430-401. (Edinburgh and London: Oliver and Boyd.) 2s. 9d. [308]

Scientific Proceedings of the Royal Dublin Society. Vol. 23 (N.S.), No. 15: The Chemical Constituents of Lichens found in Ireland—*Lecanora gangetoides*, Part 3: The Constitution of Gangeleidin. By Dr. V. E. Davidson, Dr. J. Keane and Dr. T. J. Nolan. Pp. 143-164. (Dublin: Hodges, Figgis and Co., Ltd.; London: Williams and Norgate, Ltd.) 2s. [308]

Report of the Astronomer Royal to the Board of Visitors of the Royal Observatory, Greenwich, read at the Annual Visitation of the Royal Observatory, 1943 June 5. Pp. 14. (Greenwich: Royal Observatory.) [308]

Other Countries

Commonwealth of Australia: Council for Scientific and Industrial Research. Bulletin No. 158: The Recovery of Inter-Block Information in Quasi-Factorial Designs with Incomplete Data, 1: Square, Triple and Cubic Lattices. By E. A. Cornish. Pp. 22. Bulletin No. 159: Poisonous and Harmful Fishes. By G. P. Whitley. (Division of Fisheries, Report No. 10.) Pp. 28+3 plates. Bulletin No. 161: A Review of the Evidence concerning Expansive Reaction between Aggregate and Cement in Concrete. By Dr. A. R. Alderman. Pp. 19. (Melbourne: Government Printer.) [178]

Queen Victoria Memorial, Salisbury, Southern Rhodesia. Annual Report for the Year ended 31st March 1943. Pp. 10. (Salisbury: Queen Victoria Memorial.) [178]

Association of Scientific Workers of Southern Africa. Research Memorandum No. 1: Marine Biological Research and the South African Fishing Industry. By Wm. Edwyn Isaac. Pp. 16. (Cape Town: The African Bookman.) 1s. 6d. [178]