

enable him to help in the maintenance of co-axial cable systems.

In public health, the Assistant Director of the Thailand War Veterans Organization Medical Department is taking a postgraduate course in industrial medicine at the Royal Institute of Public Health and Hygiene, London, and the Surgical Registrar of Pakistan's Liaquat Medical College, Hyderabad, is training in surgery at Guy's Hospital, London. A member of the Physical Medicine and Rehabilitation Department of Siriraj Hospital, Baghdad, is training in occupational therapy at the Occupational Therapy Centre and Training School, London. A medical officer from Nepal is following a postgraduate course in tuberculosis and chest diseases at the Welsh National School of Medicine, Cardiff, and a surgeon from Burma a postgraduate course in the same field at the Birmingham Chest Clinic. Britain is assisting the Institute for Medical

Research at Kuala Lumpur, Malaya, with equipment and has also supplied equipment to the value of £4,700 to the Technical Training Centre, Moghalpura, Pakistan. Considerable equipment as well as four lecturers have been offered to a Technical Teachers' Training College in West Pakistan, and a Pakistani teacher is taking a two-year course at the Technical Teachers' Training College, Huddersfield. A lecturer in English was sent to work for two years at the National Centre of Political Administrative and Judicial Studies, Vientiane, Laos. The Chief of the Tariff Section of Thailand's Customs Department is taking a course in general taxation at H.M. Customs and Excise, and trainees from Malaya (1), Pakistan (3), Philippines (2) and Thailand (1) are attending a course of training in central government finance in Britain. Two final chapters deal with co-operation with other agencies and work of the Council and the Bureau.

NATIONAL STANDARD REFERENCE DATA SYSTEM IN THE UNITED STATES

A NATIONAL Standard Reference Data System has been established by the Federal Council for Science and Technology of the United States, and responsibility for its administration has been assigned to the U.S. National Bureau of Standards (National Science Foundation. *Scientific Information Notes*, 1, No. 4; August-September, 1963). The System will provide critically evaluated data in the physical sciences on a national basis, centralizing a large part of the present data-compiling activities of a number of Government agencies.

The National Standard Reference Data System will consist of a National Standard Reference Data Centre at the National Bureau of Standards, and various standard reference data centres in other Government agencies and at universities, research institutes and non-Government organizations. For such centres to be a part of the National Standard Reference Data System, they will be required to meet quality standards established by the National Bureau of Standards. However, the independent and operational status of existing critical data projects will be encouraged. The initial emphasis for establishing new standard data compilation projects will be in subject-matter areas where no effort is now being applied or where the existing effort falls far short of meeting important needs for Government, science or industry.

An advisory board will review and recommend policy relative to the operation of the National Standard Data Reference System. It will include, among others, representatives from the U.S. National Academy of Sciences, U.S. National Science Foundation, and federal agencies engaged in research and development.

The National Standard Data Reference System will be conducted as a decentralized operation across the United

States, with central co-ordination by the National Bureau of Standards. As planned at present, the programme will consist of three parts: an input from scientists in many different locations; a central source of the evaluated data at the National Bureau of Standards; and an output system geared to the needs of the nation's scientists and engineers.

The input will come from scientists who are comprehensively reviewing the literature in their fields of specialization and critically evaluating the data for ultimate inclusion in the storehouse of standard reference data. These scientists may be in universities or in industrial or Government laboratories: some will be at the National Bureau of Standards. They will work singly or in small groups oriented to the traditional scientific disciplines. At the same time other scientists, similarly located, will be engaged in experimentally determining the standard reference data which do not exist in the literature. Clearly the interplay between the two groups must be close and continuous.

The central core will consist of the Standard Reference Data Centre at the National Bureau of Standards, where evaluated data will be punched on cards, magnetic tape, in notebooks and other forms, all mechanized for storage and retrieval. A review and control office will label the incoming data as to relative quality and reliability. The Standard Reference Data Centre will classify the data into as many major and minor categories as are required by the needs of the data users.

The output will take the form of a series of services aimed at different technical levels and tailored to the needs of various segments of industry. In general, it will be oriented toward the application of the data rather than toward a field of science.

BIRTH AND DEVELOPMENT OF AN OIL REFINERY

THE Kent Refinery of the British Petroleum Co., Ltd., last year completed its first decade of petroleum refining. In *B.P. Magazine* No. 9 (1963) there are three articles which vividly describe the conception, siting, construction and evolution of a modern oil refinery, two illustrated in colour, a feature of outstanding artistic merit characteristic of this re-designed 'house-organ' since its inception.

The first of the articles relates to the history of the Isle of Grain on which the refinery is situated, occupying more than 1,200 acres of land bordering the River Medway.

The story traces events from man's occupation of the Island during the late Iron Age (250 B.C.) down to the present time; it is a fascinating epic of reclamation and changing occupation of Medway marsh-land, intimately bound up with the history of the Isles of Grain and Sheppey. The folding pictorial map of this Medway region, in its portrayal of people, industry, shipping and historical events down the centuries, due to Wegner, is quite excellent.

The second article, entitled "A Refinery is Born", attempts to tell the story of the early hopes and fears of

siting a refinery in the Isle of Grain; of the engineering, technical, political and local environmental difficulties which had to be overcome in planning such a vast enterprise to meet, at the time, the unforeseeable demands for petroleum products years ahead. In this graphic account are linked some of the well-known personalities in the Company who were concerned with the initiation and construction of this plant, admittedly involving highly organized team-work under their direction, without which the scheme could never have met with success. It makes fascinating reading, because the human effort involved in overcoming natural difficulties of the site, weather, floods and other hazards, inevitably bound up with industrial developments in raw estuarine territory such as the Isle of Grain (common to so many of the world's major refinery locations), is so modestly described.

The third article, entitled "And Before the Ink was Dry", is a technical account of the growth of this Kent

refinery; it brings the whole project up to date. "The establishment of a new 'grass-roots' refinery must be influenced by the market requirements, the technology available at the time and the forecasts of the foreseeable future. The history of Kent Refinery is not peculiar in these respects but the seventeen years since the project was conceived and the ten years since the first oil was processed in the refinery have been years of unprecedented change in all these directions." It is recorded that the through-put in the first full year of operation was 3.4 million tons; the 1962 figure is 9.8 million tons. Before the ink is dry in drafting new specifications for extensions to the plant, operations and products-output, technical advances move apace and overtake contemporary ideas. The oil industry is one of the most flexible of all; it is the sense of urgency and adaptability which have made it the dynamic influence it deservedly exerts in our times.

GRAVITATION IN THE U.S.S.R.

M. A. GARBELL of the Garbell Research Foundation, San Francisco, California, believes that gravitation together with its relativistic and quantum theoretical aspects constitutes the final problem of modern theoretical physics, and consequently he has taken considerable trouble to produce a detailed report of the First Soviet Gravitation Conference which was held during June 27-30, 1961, at the School of Physics, Moscow State University*.

The report consists of two parts. Part I, composed by M. A. Garbell, contains synopses and abstracts of each of the seven subject sessions into which the conference was divided, together with analytical comments, annotations and guiding references to other pertinent papers. Part 2 consists of a full translation from the Russian of the condensed versions of the eighty-three contributions presented to the conference and which were published by the State University in 1961. The first two sessions were devoted to the classical theory of gravitation, and the subsequent sessions to non-Riemannian generalizations of geometry, the quantum theory of gravitation and non-linear equations, experiments, cosmology and gravimetry respectively.

In his general review, M. A. Garbell comments that the conference was devoid of any momentous breakthrough, and though the assembly consisted of members of the foremost Soviet schools of thought on gravitation, relativity and quantum physics—with the conspicuous

absence of V. A. Fok and representatives from European satellite countries—the gathering seemed painfully perplexed with endless questions, nearly all of which remained unanswered. In general, theoretical concepts based primarily on Einstein's theory of relativity were advanced, but there were exceptions such as Petrov's classification of Einstein spaces, Ivanenko's contributions towards a non-linear unitary field theory, the atomic and molecular finite satellite programme of the Dubna group, and Smorodinskiy's ideas on the neutrino-antineutrino world.

Academician Blokhinstevev commented that any assumption that the gravitational charge of an antiparticle might be negative, or even that the gravitational charge of a photon might be zero, would constitute an insurmountable paradox. Kadyshevskiy proposed the β -decay length of weak interaction as an irreducible unit for the smallest finite spatial building block of the universe. Two proposals were made by the Joint Nuclear Research Institute (Dubna) group for gravitational experiments in the laboratory. The first was an experiment in which the emission of gravitational waves could be detected without the necessity for setting up a receiver-absorber to pick up the emitted waves, and the second a vertical beam experiment for the detection of any negative gravitational mass of the K -meson antiparticle by means of an interference method first described by M. Good of the University of Wisconsin.

Soviet support in cosmology is for a non-homogeneous and anisotropic universe and there were strong suggestions that the neutrino exerts a substantial effect on the determination of the geometry of the universe.

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* Garbell Research Foundation, San Francisco. Garbell Aerospace Series, No. 9: *Theses of the First Soviet Gravitation Conference held in Moscow in the Summer of 1961*. By Maurice A. Garbell. Pp. 130. (San Francisco, California: Garbell Research Foundation, 1714 Lake Street, 1963.) 7.50 dollars.

SICKLE-CELL ANÆMIA

AN investigation of the clinical manifestations of sickle-cell anæmia found in the Wankie district of Southern Rhodesia, prepared by Dr. Trefor Jenkins of the University of Natal, indicates that the disease is similar in most respects to that found in the Congo Republic, and differing only slightly from that found in West and East Africa*. The more marked differences between the condition seen in Africa and the United States have been confirmed.

Although the condition is not common in Southern Rhodesia, it is felt that many cases of sickle-cell anæmia have passed unrecognized over the years because practitioners have been unaware of the African 'variety' of the

disease. Most medical text-books still describe the disease as it occurs in the American Negro, between the ages of five and ten years, when it is characterized by arthralgia, fever, anæmia, cardiomegaly, abdominal pains simulating one of a number of surgical emergencies, chronic punched-out ulcers about the ankles and a variety of neurological disturbances resulting from cerebral thromboses.

The disease as it occurs in Africa affects a much younger population, the average age at diagnosis varying from just less than four years in Nigeria to just more than one year in the Congo Republic. Hendrickse raises doubts concerning the very young age at diagnosis in the Congo series. Because the diagnosis had not been confirmed by electrophoretic examinations of the hæmoglobin, he

* *The Central African Journal of Medicine*, 9, No. 8; August, 1963.