

Among other topics I discussed was the Ouelletite spray field; the existence of good specimens of shatter cones probably need much more investigation. Stressed also was the possibility of recognizing altered meteorite fragments. This, I suggested, might need many more tools than the ordinary microscope; X-ray, electron microscopy and infra-red spectroscopy may need to be used.

I directed attention to the elliptical distribution of alluvial carbonado-type diamonds in Ghana which are associated with Recent conglomerate Deposits and also with deep valleys, including the Bosumtwi crater.

Earlier in his report, the director of the Geological Survey Department, Dr. J. E. Kudjo, had mentioned the recent discovery of deposits of spodumene and columbite near Mankwarzi and more gold deposits in northern Ghana near Nangodi. In a visit to the lake by the delegates to the conference, interesting sites around the lake were examined and specimens were collected; a plane flight was taken over the lake.

A new survey of the lake district is now in progress. The dredging of the lake has been considered a possibility

in the near future. It is hoped that a continuous record of the increase in level of the lake may be kept, and a careful analysis of the terrace beds may soon be made. There is much doubt at the moment as to whether the scattered quantities of iron-rich slags that exist in Ghana have been produced by large iron-smelting communities which lived in the dense forests long ago. A survey of the distribution and an analysis of these slags may also need to be carried out.

The Bosumtwi crater, owing to its relatively recent formation, may yet throw much light on the genesis of isolated craters. It would seem, therefore, that the Ghana Government, by initiating faster surveys to clear up the points still in dispute, would be rendering a service to world science.

¹ Dietz, R., Chao, E. C. T., Litter, J., and Fahey, J. J., *Abst. Ann. Meeting Geol. Soc. Amer.*, Cincinnati (November 1961).

² Junner, J. R., *Geology of the Bosumtwi Caldera and the Surrounding Country* (1937).

³ Cohen, A. J., *Sci. Amer.* (June 1961).

⁴ Charter, A. C., and Summers, *Sci. Amer.*, 203, 128 (1960).

⁵ Culp, F. L., and Hoopes, H. G., *J. Appl. Phys.*, 132, No. 11 (1961).

⁶ Krinov, E. L., *Principles of Meteoritics. Intern. Series of Monographs in Earth Sci.*, 7 (Pergamon Press, 1960).

MEDICAL RESEARCH IN THE BRITISH CARIBBEAN

THE eighth annual meeting of the Standing Advisory Committee for Medical Research in the British Caribbean was held in Trinidad during April 27-30. The meeting was formally opened by His Excellency the Governor General, Sir Solomon Hochoy, and addresses were also given by the Acting Minister of Health and Housing, Mrs. Isobel Teshea, the pro-vice-chancellor of the University of the West Indies, Dr. H. D. Huggins, and Prof. M. L. Rosenheim.

As Prof. Rosenheim indicated in his address, medical research is not necessarily dependent on the provision of expensive facilities. In this regard the identification of a hitherto undescribed cardiomyopathy by members of the staff of the Department of Medicine, University of the West Indies, and of the Medical Research Council Epidemiological Research Unit, is noteworthy. The topic of the scientific meeting was "The Child in the West Indies", and forty papers were read; fourteen from Trinidad, sixteen from Jamaica, four from Barbados, two each from British Guiana and Puerto Rico, and one each from St. Vincent and Grenada. This wide representation reflects the encouragement given by the Committee to medical officers in the area to undertake research and to report their results at this annual meeting or in the scientific press. The quality of the work presented was commendably high.

The first session was concerned with accidents and preventable disease in children. Papers by Drs. Wynter and Burke from Jamaica and by Dr. Ratan from Trinidad demonstrated that kerosene poisoning is by far the commonest accident in the area, but only one out of 224 cases died. Accidents at home are very common, but since other diseases such as gastroenteritis, bronchopneumonia and malnutrition are still commoner, only 7 per cent of the admissions to the children's ward in Jamaica were due to accidents. Dr. Eric Baek reviewed the changes in disease patterns in children at the University since 1955. The session ended with an interesting comparison between a paper by Dr. Massiah of Trinidad and Dr. Byer of Barbados. Dr. Massiah showed that it cost more to treat the cases of diphtheria and tetanus which occur in Trinidad than it did to conduct an immunization campaign against diphtheria, tetanus, whooping-cough and poliomyelitis, which is protecting about two-thirds of the population of Barbados. Dr. Byer demonstrated that the immunization campaign had

very significantly reduced the incidence of these diseases over a six-year period, so such a campaign is not a luxury but good economics as well as good medicine.

The second session was on viral and bacterial diseases, and included reports on the epidemics of poliomyelitis in British Guiana and eastern equine encephalitis in British Guiana and Jamaica. The Trinidad Regional Virus Laboratory and the Department of Microbiology at the University of the West Indies again proved their value by swiftly identifying the organisms in these outbreaks, and also by proving the first reported human case of rabies in Grenada. Dr. Walter Singh from British Guiana gave two papers, one on the clinical aspects of the polio epidemic and the other on congenital cataract and heart disease following an epidemic of rubella in British Guiana in 1962. Among bacterial disease in the tropics gastroenteritis is the great scourge of the paediatrician. There is probably no hospital in the Caribbean which has room for all the cases of infantile gastroenteritis which should be admitted. The renal and cardiovascular complications of this disease were discussed by Drs. Ward and Christian of the University of the West Indies.

At the third session, on nutrition and child welfare, the remarkable efficiency of the Barbados Public Health Service was again demonstrated by statistics from their welfare clinics. Dr. Diggory of Trinidad gave an interesting paper on the very difficult problem of health education in a rural community. Drs. Garrow and McLean, of the Medical Research Council Tropical Metabolism Research Unit in Jamaica, discussed the in-patient management of kwashiorkor and marasmus. Severe infantile malnutrition carries a mortality of 10-20 per cent even in the most successful units, and the cause of death is not understood and prognosis is difficult. Dr. Osborne tackled the question of out-patient management of infantile malnutrition in a very practical way. By skilful use of cheap local food she devised a diet costing about five shillings per week per child, and with it showed very good results among her out-patients in St. Vincent. Unfortunately, proprietary baby foods are so effectively advertised that mothers spend far more than five shillings per week on small quantities of expensive preparations which they then have to give in homoeopathic amounts. Nutrition survey results were reported from Barbados and Puerto Rico, and the session ended with a paper on population control in Barbados. This is the most densely populated

island in the West Indies, and family planning clinics have been set up by a voluntary organization and have been widely used. The discussion provoked by this paper lasted throughout the lunch hour.

In the afternoon Dr. Henry reported on the survey of diabetes in Trinidad. Of a random sample of more than 24,000 people, representative of the whole population of the Island, there was a 98 per cent response-rate. The total incidence of diabetes was found to be 1.88 per cent. Dr. Quamina demonstrated that the age of sexual maturation of Trinidadian schoolgirls was not earlier than that of girls in temperate climates. Dr. Miall described the surprisingly high incidence of angina found in a Jamaican rural population; this condition is associated with hypertension, high serum globulin-levels and abnormal haemoglobins. Dr. Milner reported³ a family with haemoglobin D which was found in the course of the aforementioned survey. Another rarity was described by

Dr. McDowall of Trinidad, who reported a syndromæ resembling rickets, but associated with hypercalcaemia, which only affected the girls of a large Indian family.

The meeting was attended not only by numerous medical workers from the Caribbean area but also by representatives of the Pan-American Health Organization (World Health Organization), the National Institutes of Health, Harvard University, the Communicable Diseases Center, Georgia, and the Massachusetts Institute of Technology in the United States, and the Department of Technical Co-operation, the Tropical Medicine Research Board and the Medical Research Council of Great Britain.

The meeting indicated that medical research under the auspices of the Standing Advisory Committee is in a healthy and developing state and further important scientific contributions from the area concerned can be confidently expected.

J. S. GARROW

METEOROLOGICAL SATELLITES AND THE WORLD WEATHER WATCH

THE fourth Congress of the World Meteorological Organization was held at Geneva during April, and among the major questions discussed were plans for future meteorological satellites and further steps towards a World Weather Watch. The Congress was informed of the agreements between Soviet and American authorities regarding their satellite programmes.

Weather satellites will not, of course, replace the present world-wide network of meteorological stations, but will, as one of their main tasks, fill in the 'blanks' in the weather charts over oceans, deserts and polar regions. The United States will launch several more *Tiros* satellites in 1963 and 1964 at approximately four-monthly intervals to ensure the continued availability of satellite picture data until their more advanced *Nimbus* satellite can be proved operationally successful. Various orbits will be tested and also equipment, including instruments for further measurements of infra-red radiation. It is hoped to test an automatic picture transmission system intended for use on *Nimbus*. The automatic picture transmission system is a remarkable new development designed to take and transmit pictures for reception by a relatively inexpensive receiving station. The Congress was cautioned, however, that the whole satellite programme is still in an experimental stage and further experience might lead to modifications in the apparatus.

The *Nimbus* meteorological satellite will be developed between 1963 and 1966 and will furnish higher quality data than the *Tiros* programme and in greater quantity. It will be Earth orientated so that one of its three cameras, pointing straight downwards, will view the Earth's

atmosphere or surface directly below the space-craft, thus simplifying the problem of adjusting cloud pictures to fit a map. The orbit will be nearly polar to allow almost total daily coverage of the Earth—every part of the Earth (except where there is polar darkness) will be seen in sunlight at least once every 24 h, and the same area can be seen day after day (whereas the *Tiros* satellite can see a given area for limited periods only). Electronic computers will be used to convert data into forms suitable for daily weather analysis and forecasting; for example, geographic grids (latitude and longitude) will be produced to superimpose on the pictures, and maps showing cloud cover and type will be made to help to interpret the picture data.

The solution of the problem of the general circulation of the atmosphere would assist the rapidly growing applications of meteorology to economic activities. Before progress can be made with this problem certain gaps must be filled in the existing network of observations, and adequate supporting communications systems established. The Congress decided on a comprehensive plan for a World Weather Watch which would include improvement of the present network, the organization of upper-air measurements from merchant ships, and the exploration of the possibilities of automatic weather stations, of weather satellites and of co-operation with oceanographic interests. The rapidity of scientific and technical developments has led the Congress to call for the establishment of an advisory committee of eminent scientists who will advise the Organization on research and operational problems, especially in the light of data obtainable from artificial satellites.

W. S. GARRICK

STATISTICS OF EDUCATION IN BRITAIN

THE Minister of Education has recently published Part I of the *Statistics of Education, 1962*, in an attractive new format*. This comprises the bulk of the data dealing with schools: the remainder, which deal with examinations for the General Certificate of Education, further education, awards, teacher training, school health and educational building, will appear later.

The first section deals with births, population of school age, and projections of these figures to 1985. The demographic part of the projection was undertaken by the

* Ministry of Education. *Statistics of Education, 1962*. Part 1. Pp. ii + 128. (London: H.M.S.O., 1963.) 20s. net.

Government Actuary and the General Register Office; in addition, it was assumed that the Christmas leaving date would be eliminated after 1963-64, and that the trend towards later leaving shown in the past nine years would continue up to 1985. On these assumptions, the increase in the school population in 1985 over 1960 would be 28 per cent at ages 5-10, 8 per cent at ages 11-14, and 159 per cent at ages 15 and over. The assumptions imply that by 1985, 35 per cent of the 16-year-olds and 20 per cent of the 17-year-olds will stay at school: the corresponding percentages in 1960 were 15 and 8. The magnitude of the tasks before the educational system will be apparent from these figures.