

results of these investigations will be awaited with interest.

As is natural with a conference of this type occurring annually, much of it was taken up by what can only be called interim reports, giving the outline of the

advances made during the past twelve months, rather than final and conclusive statements on completed programmes; this does not detract from its interest, but rather adds interest to the prospects for the future occasions. J. F. P. H. GREENE

## INDUSTRIAL CHEMISTRY IN BRITAIN

THE ninety-eighth annual report on Alkali, etc., Works by the Chief Inspector for England and Wales covering the year 1961\* records 10,583 visits and inspections during the year, including 264 special visits by the Chief and Deputy-chief Inspectors, compared with 9,861 in 1960. Of these, 429 were to, or in connexion with, works not registered under the Act, 21 were concerned with control of radioactive emissions and 102 were to, or in connexion with, colliery spoilbanks. During the inspections, 6,992 quantitative analyses were made of gases evolved from the processes in operation, compared with 3,724 in 1960. Most of the increase is due to a special investigation concerning salt glazing of earthenware, where 3,065 tests were made, compared with 1,060 in 1960. In addition, 541 special samples, compared with 486 in 1960, were taken and submitted for analysis to the Government Chemist.

As a result of the special investigation just mentioned, it was concluded that for the present the practice of salt-glazing must be accepted. There is no available suitable alternative to common salt and scrubbing the gases would involve a heavy financial burden on the industry. Pending a solution of the acid or mist removal problem, or the adoption of other glazing techniques, the provisional 'best practical means' is a chimney not less than 120 ft. high for salt addition up to 1.5 cwt.; research

\* Ministry of Housing and Local Government; Department of Health for Scotland. Ninety-eighth Annual Report on Alkali, etc., Works by the Chief Inspectors, 1961. Pp. 73+4 plates. (London: H.M. Stationery Office, 1962.) 5s. 6d. net.

work by the British Ceramic Research Association should continue. In connexion with sulphuric acid works, the report directs attention to a tendency for over-reliance on recording instruments, which especially on acid works need routine check by conventional analytical methods, particularly following a shut-down, temporary by-passing, etc., when for one reason or another the instrument does not always respond. The report includes interesting reviews of developments in the fertilizer industry during the past 80 years and of the many developments in chlorine works since chlorine came into commercial use; also the experience of the Inspectorate of the past three-and-a-half years in the iron and steel industry is also briefly reviewed.

The Chief Inspector for Scotland reports that progress in dealing with industrial air pollution to bring it within the requirements of the Clean Air Act has out-paced reduction of pollution from its main evil—the domestic fire. Besides 552 visits of inspection under the Act, 178 miscellaneous visits were paid and 79 visits on work not directly related to the Act. A study was made of existing industrial chimneys and the heights of 150 chimneys were plotted against the fuel-burning rates of the furnaces. When industrial chimneys were built to create draught, even quite small installations were provided with chimneys higher than present-day standards. In consequence, smoke was taken well clear of any downward movement of air due to wind turbulence created by surrounding property—a point liable to be overlooked to-day.

## ARID ZONE RESEARCH

IN the budgetary year 1956–57 the United Nations Educational, Scientific and Cultural Organization decided to convert its research programme on the problems of arid lands into a "Major Project" for a period of five years. This meant that larger allocations of funds and personnel were channelled into this field of work. Though some polar areas may in fact be deficient in moisture, the arid regions which were calculated to cover 23 per cent of the Earth's land surface lie mainly in two broad but interrupted belts in northern and southern tropical and subtropical latitudes in lands which are, with the major exception of South Africa, members of Unesco. One major result of the research programme has been the publication of a series of quarto volumes under the general title *Arid Zone Research*, of which the one under review\* is Vol. 18.

By virtue of its status as a unique international organization Unesco has been able to call on the best

\* The Problems of the Arid Zone: Proceedings of the Paris Symposium. (*Arid Zone Research*, Vol. 18.) Pp. xii+481. (Paris: Unesco; London: H.M. Stationery Office, 1962.) 47.25 NF.; 69s.; 15.30 dollars.

brains throughout the world in the preparation of these research volumes. As authoritative statements of the present state of knowledge and research in such fields as climatology, hydrology, ecology, salinity, land use and many others, they stand unrivalled. Whereas the whole series should automatically be on the shelves of every serious library, certainly in every university departmental library covering the many fields concerned, the truth is that their circulation and use remain lamentably small and restricted. To take but one example in the research series, *The History of Land Use in Arid Regions*, with its world coverage, has a wealth of material not previously available in the languages of Western Europe and certainly not gathered together in one volume, yet indispensable if any planning for the future is to have a firm scientific basis.

As a major project the arid zone programme comes to an end this year and this lengthy report of the main symposium, if it should prove to be the last volume in the series, would form a fitting climax. The symposium was attended officially by 250



scientists from 33 countries, but the list of participants does not include the names of a number of world figures who certainly were present at the meetings.

Apart from the inaugural and presidential addresses, 27 papers are printed; most were presented by their authors and followed by a discussion which is given in summary form. The papers are arranged in four groups: the state of scientific knowledge, nomadism, alternative uses of scarce water supplies and, finally, four papers on public awareness of the educational problem. The thirteen papers in the general section deal with water, ground-water, climatology, micro-climatology, soils, salinification, plant physiology and ecology, human ecology, insects, winds and solar energy and saline water conversion. It is interesting to find nomadism objectively studied by the Food

and Agriculture Organization and viewed as a proper use of semi-arid lands under adequate control—thus extending on a world-wide basis the famous Cain and Abel experiment of Israel.

It would be invidious to select papers from this rich collection for individual comment; but three conclusions would seem to emerge. The first is that the research needed is usually in the borderland between present-day accepted fields of knowledge, in fact, the interrelation of the many factors. The second is the delicate balance, easily upset, which exists in arid lands between the biota, including man, and the environment. The third is the need for an open mind, willing constantly to re-think and re-assess the problems and their solution.

L. DUDLEY STAMP

## DAIRY RESEARCH IN SCOTLAND

THE Hannah Dairy Research Institute at Ayr now has a staff of about ninety, of whom some thirty are qualified in agriculture or science. The recent triennial report\* shows that the entire process of dairying is being covered, from the production of food on the farm to the chemistry, biochemistry and bacteriology of milk and milk products. The programme of research is agreed in consultation with the Agricultural Research Council (London) and the Department of Agriculture for Scotland.

The previous report described a unique range of new equipment for respiration experiments with sheep and cattle, and a splendid new climatic laboratory. It is evident that these have been put to immediate use and that the work in these fields is wisely receiving emphasis. Thus the careful reader will find on p. 33 further support for the conclusion that while rations differing considerably in composition may be equally valuable for satisfying the maintenance requirements of ruminants, their nutritive value for production may differ widely. Much vital supporting information is now being assembled,

\* Hannah Dairy Research Institute. Report for the three years ended 31st March, 1962.

on such questions as the effect of environment, movement and lactation on the energy requirements of sheep and cattle. The eventual effect of this work may well be felt wherever feeding standards are used.

Capital for the climatic laboratory was provided by the Colonial Office in order to obtain basic knowledge of value in the improvement of cattle in hot countries. A broad and vigorous approach is being made to the study of factors that influence temperature regulation, heat tolerance and acclimatization. Much of this may be of value also in temperate countries.

This Institute is clearly making a major contribution to research on many aspects of Britain's greatest and most vital agricultural enterprise. It may be symptomatic of the times, but it will nevertheless be surprising in some other countries that less than 1 per cent of the money required annually should now come from voluntary contributions.

Sufficient background is provided to enable the general reader to appreciate the reason for doing each piece of work. While a great deal of factual information is included, ample references are given to enable the specialist to trace detailed reports. As always, this report is impeccably edited.

## UPTAKE OF GLUCOSE, AMINO-ACIDS AND VITAMINS BY HUMAN AMNION CELL CULTURES INFECTED WITH A TICK-BORNE ENCEPHALITIS VIRUS

By DR. P. HALONEN, L. HJERP, M. PYHTILÄ and P. WECKSTRÖM

Department of Virology, University of Helsinki, and Microbiological Laboratory, Läketehtas Orion Oy, Helsinki

CHEMICALLY defined media designed primarily for cell cultures are extensively used for the propagation of viruses in such cultures. To obtain the maximal yield of viruses requiring a lengthy incubation and maturation time in cell cultures, change of the medium must usually be omitted. Accordingly, the best medium for such virus propagation may not necessarily be of the same composition as that for optimal cell growth, when frequent change of the medium is possible. To examine the basic aspects of this problem it appeared important to

know whether a critical loss of metabolites from a chemically defined medium could be obtained during prolonged incubation of uninfected and virus-infected cell cultures. This communication describes the changes in the concentrations of glucose, amino-acids and vitamins of the B-group in Eagle's minimum essential medium<sup>1</sup> in uninfected human amnion cell cultures and in cultures infected with a tick-borne encephalitis virus.

Strain A 52 of the tick-borne encephalitis virus was selected because in the continuous line of human