

tion that an inhomogeneous population probably finds its variety useful, and described various ways in which what at first sign seem to be harmful traits can be of use in a community. He was unconvinced that civilized communities are deteriorating in the manner that eugenicists commonly assume, and he argued that, even if there were this deterioration, there is no reason for thinking that it has a genetic rather than an environmental origin. Colourful phrases such as 'humanity is silently rotting at the core' and is being 'recruited from submen' seemed to him without foundation and no one in the audience saw fit to support them. The topical question was raised of the long-term genetical effects of the increase in radiation to which, as a result of industry and nuclear weapon testing, we are being exposed. Penrose thought that the increased mutation-rate that this would probably lead to, simply added one more imponderable to an already ample supply, and would make no positive predictions about its effect.

Lord Boyd Orr, summing up the symposium, said that he welcomed all the developments there might be in sanitation and preventive medicine, on one hand, and contraception on the other. To a large extent they cancel one another out, but he expected the world to hold perhaps 4G ($G = 10^9$) people by 1980 and 5 or 6G by the end of the century. This prospect, and the prospect that the existing ratios between the numbers of the different nationalities would be altered, left him unworried. With modern knowledge, food production could be increased by a larger factor than population is likely to increase by, and there could be enough for all. The difficulties that he foresaw were political rather than scientific. Physics appears to governments to be much more useful than biology both in war and for making money; it therefore gets the lion's share of research endowment. People had got on very well in the past without jet planes and hydrogen bombs, but they could not get on without food, and he looked forward to an era of agrarian abundance in which we no longer galloped through irreplaceable resources with our present abandon but farmed wisely and depended for our energy supplies primarily on the inexhaustible flow from the sun. He looked forward to a magnificent new world even though it is likely to be very different from the one we have known as children. But we would only get it if we got rid of fear and used our wits.

The humanism of Lord Boyd Orr's tone of exuberant confidence suited the mood of the symposium and it finished in an atmosphere of restrained optimism. It did not, however, go so far as to produce overt Swinburnian exaltation: "Glory to Man in the highest! for Man is the master of things".

N. W. PIRIE

CHEMICAL RESEARCH LABORATORY, TEDDINGTON OPEN DAYS

FOR the eighth year in succession the Chemical Research Laboratory, Teddington, was open to visitors from universities, industry and government departments during September 28–October 1. Exhibits by the High Polymers Group illustrated how systematic changes in the structure of the resin matrix and the number or nature of the functional groups can lead to resins of particular value in specific

separations. Resins containing amphoteric groups were shown which act as insoluble sequestering agents with great selectivity for certain ions such as copper. Of special interest were the ion-selective membranes. These are of considerable importance in physical and biological science and are being used in osmometry and dialysis. Polyvinyl alcohol and methoxymethyl nylon films of graded permeability have considerably extended the scope and accuracy of osmotic pressure measurements; other membranes show promise for use in the dialysis of aqueous solutions.

The Radiochemical Group showed a wide range of chromatographic methods of analysis as applied to the inorganic field. A striking example was the simplified and rapid method for field use in geochemical prospecting. Applications of ion-exchange resins were demonstrated: in one, the quantitative separation of metals such as copper, cobalt and nickel adsorbed on an acidic ion-exchanger was effected by an organic solvent; in another, gold and other metals (such as zinc, nickel, copper, iron, silver and cobalt) adsorbed on a strong base exchanger could be eluted separately by use of suitable organic solvents. Other separations involved the use of ion-exchange membranes.

A novel apparatus for continuous extraction of a metal salt solution by organic liquids consisted of a rotating cylinder mounted concentrically inside a stationary outer vessel; the liquids passed counter-current in the annular space between the cylinders. The measurement of carbon-14 based on the use of acetylene in a scintillation counter was demonstrated, the acetylene being prepared from carbon dioxide by reaction with lithium and conversion to carbide. The method is particularly useful for very low activities.

In the Inorganic Group, an exhibit demonstrating the occurrence of selenium in wastes from the flash-roasting of pyrites typified the interest taken by the Laboratory in waste materials as sources of valuable products. Wastes from pyrites plants arise in the final purification of the sulphur dioxide by acid wash or water sprays; samples were shown containing from 20 to 60 per cent of selenium. Methods of recovering the element are being studied and various products were on view, as well as excellent specimens of the various allotropic modifications of selenium. Work has been commenced on the separation of rare earths by ion-exchangers, and promising separations of the cerium group of elements have been made using ethylenediamine tetra-acetic acid as the eluting agent. Techniques for the preparation of pure rare-earth metals are being studied, and samples of cerium and lanthanum by reduction of the fluorides with lithium were shown. The fine collection of metals of high-degree purity held by the Laboratory on behalf of the Pure Metals Committee of the Department of Scientific and Industrial Research was again on view.

The current programme of the Organic Group was illustrated by collections of new intermediates and pure chemicals of potential usefulness. A recently introduced technique, that of zone melting, was shown in its application to the purification of organic compounds. The convenience of this method lies in the ease with which the cycle of operations can be repeated automatically. The purification effected was strikingly demonstrated by the removal of a coloured material, induline, from naphthalene.

Other interesting apparatus included that used for pressing clear disks from mixtures of pure potassium chloride and various solid organic materials for

examination by infra-red absorption spectroscopy; a cryoscope for measurements of the vapour pressure of acetylene; and a micro-analytical train in which isotopically labelled carbon dioxide was collected for isotope abundance measurement. Progress in preparative and synthetic work was shown under the following headings: an exploration of possible uses of 4-hydroxy-isophthalic acid and its derivatives; reactions of epoxides with phosgene; isomerization of ethylcyclopentane; new methods of labelling aromatic compounds; and new ion-exchange resins.

The National Collection of Industrial Bacteria presented a colourful exhibit in which various pigment-producing bacteria were used to produce paintings and the printing of words on agar plates. The more prosaic work of the Collection was illustrated by demonstrations of the techniques employed in identifying, classifying and preserving bacteria.

An apparatus of interest to fermentation technologists was that used for the continuous anaerobic culture of sulphate-reducing bacteria, in which hydrogen is the reducing agent and carbon dioxide the main carbon source. The apparatus, which was developed at the Microbiological Research Department, Porton, for aerobic organisms, can be adapted for the culture of most micro-organisms; the continuous technique is claimed to be more efficient than batch fermentation. A process for the production of sulphide from sulphated sewage sludge was demonstrated. At present the sulphide is produced at the expense of the valuable methane formed during the normal digestion of sludge; attempts are being made to enable the two processes to proceed simultaneously. Chromatographic techniques have been applied to follow the carbon metabolism in sulphate-reducing bacteria, and a new type of cytochrome has been detected in these organisms. This is the first time

that a cytochrome has been observed in an anaerobic organism.

The field covered by the Corrosion Group was strikingly demonstrated by a wide variety of exhibits. Of particular interest was a collection of characteristic examples of damage by corrosion in industry and in the home. The common danger of using unsuitable combination of metals in constructions was illustrated by galvanic cells in which various pairs of metals were immersed in salt solution. Specimen tubes and histograms of corrosion data showing the influence of various treatments of tubes and boiler water illustrated the study of the corrosion of mild steel tubes in Scotch marine boilers undertaken on behalf of the British Shipbuilding Research Association. New studies of the oxidation of special steels in flue-gas atmospheres have been commenced in collaboration with the British Electrical and Allied Industries Research Association and the British Iron and Steel Research Association; a new apparatus designed for this work was on view.

Ancient buried iron objects in a good state of preservation illustrated the inhibitive effect of tannins in the soil on the activities of sulphate-reducing bacteria. Field trials of tannins as a means of combating underground corrosion are in progress. Recent work on the prevention of tarnishing of copper and silver has led to the use of paper wraps impregnated with certain compounds, for example, copper chromate. The method is based on the removal of traces of hydrogen sulphide from the air. Other exhibits included the rapid attack of steel by aqueous suspensions of sulphur; the use of cyclohexylamine carbonate as a vapour-phase inhibitor; applications of sodium benzoate and sodium nitrite in cooling systems; and examples of filiform corrosion. A new and comprehensive classification scheme for corrosion topics was on view.

NEWS and VIEWS

Nobel Prize for Physiology and Medicine: Profs. J. F. Enders, F. C. Robbins and T. H. Weller

THE Nobel Prize for Physiology and Medicine for 1954 has been awarded jointly to Prof. John F. Enders, of Boston, Prof. Frederick C. Robbins, of Cleveland, and Prof. Thomas H. Weller, of Boston, for their work on poliomyelitis. This team of workers had been studying the growth of certain human viral infections in tissue culture. Early in 1949, they announced that the Lansing strain of poliomyelitis virus caused cytopathogenic changes in cultures of various human embryonic tissues and that this action could be neutralized by specific antibody. Afterwards, their isolation of the three known serological types of poliomyelitis virus in tissue cultures by direct inoculation with faecal material from human subjects, along with the demonstration of direct typing of the virus strain with specific antisera, has opened up a new field in the laboratory diagnosis of the disease and is providing also a valuable technique for epidemiological studies. The utilization of tissue-culture methods for the possible production of safe poliomyelitis vaccines is another immediate result of immense practical importance and is now being actively pursued.

An additional contribution of all this work is that it has brought poliomyelitis research within the reach

of investigators previously debarred by lack of elaborate experimental facilities. Of special importance, however, to virus research is the unequivocal demonstration that an apparently strictly neurotropic virus can multiply *in vitro* in cells which are not ordinarily susceptible to it *in vivo*, and the conditions and mode of growth in such a system have applications for other problems. Within the past year, Prof. Weller has described the cultivation of chicken pox and herpes zoster viruses, and Prof. Enders that of measles virus in tissue culture. The stimulus of all these discoveries is activating research not only in virology but also in microbiology generally.

Presidency of the Royal Aeronautical Society: Mr. N. E. Rowe, C.B.E.

MR. N. E. ROWE, technical director of Blackburn and General Aircraft, Ltd., Brough, East Yorks, has been selected as president-elect of the Royal Aeronautical Society and will take office at the annual general meeting of the Society to be held on May 5, 1955. After his apprenticeship in marine engineering at Devonport Dockyard and service in the First World War, Mr. Rowe went to the Imperial College of Science and Technology, London, holding a Royal scholarship and Whitworth exhibition, and gained a diploma of the College in 1924 for postgraduate