

from scrap arising from aluminium ware and utensils' manufacture and from used and discarded aluminium vessels. The Institute has also made progress in preliminary experiments on the fabrication of special primary batteries characterised by many useful features such as high current and power output, prolonged cell life, lightness and wide operation range.

The most important tanning material used by the Indian leather industry is wattle bark and for this, the country is dependent on outside supplies. Intensive research by the Central Leather Research Institute, Madras, has located an efficient substitute in Karada bark.

In addition to advanced fundamental research, the National Physical Laboratory, New Delhi, has also been engaged in industrial research. It has evolved an improved gas carburettor of the automatic type capable of operating in conjunction with petrol carburettor but having independent control. A digester suitable for production of bone meal for use as fertilisers has also been designed in the Laboratory. The

Central Road Research Institute, New Delhi, is engaged in studies on road materials and construction techniques which will yield better roads at lower cost. The Institute is directing attention to the improvement of locally-made bricks for metalling rural roads by increasing their compressive strength and decreasing the formation of dust, which occurs through wearing of the brick metal.

To fill the gap between research and its industrial application, the Government has established a National Research Development Corporation. The main function of the Corporation is to exploit in the public interest inventions of the Council of Scientific and Industrial Research and its National Laboratories, inventions of other State-owned Research Institutes and of other research organisations like Commodity Committees. It will also afford facilities to universities and other research institutions, and where public interest so demands, to individuals also, to exploit their inventions.

ANTIBIOTICS

IN the course of a lecture delivered at the Indian Institute of Science, Bangalore, Professor E. B. Chain of Oxford traced the growth of antibiotics from the time that he and his group of workers demonstrated in 1940 that a mould product containing the active principle designated penicillin from *P. notatum* possessed remarkable curative properties. The strain was by no means new, having been isolated by Alexander Fleming earlier.

Professor Chain recalled how after preparing a somewhat purified product from the culture fluid he injected some 30 mg. into a mouse and expected it to die. The greatest surprise was that it did not, and the experience was unforgettable. After the animal experiments, there were some dramatic cases of cure in hospital patients. These initial successes with penicillin inaugurated a new era in chemotherapy.

The chemical formula of penicillin proposed by Chain and Abraham was not initially accepted by any one. But elaborate studies with the aid of the X-ray diffraction patterns, Fourier analysis and interatomic distance measurements made later have only confirmed the original formula. The substance contains two amino acids, but wherefrom their wonderful properties are derived is not clear.

Attempts have been made recently to prepare biosynthetic penicillins by using different acids and constituents in the culture media.

The products behave in the same manner. Lately, a new type of penicillin, 'Cephelospirin', has been reported. It is different from penicillin, in that it gives α -amino-adipic acid on hydrolysis, is also very active against gram negative bacteria, and is non-toxic. Further work on this is being watched with great interest.

Reviewing the work on other antibiotics, Professor Chain observed that Waksman had studied the properties of streptomycin isolated from cultures of *S. griseus* in great detail. In some cases of typhoid, it was found to be highly useful *in vitro*, but not *in vivo*. Pellmann of Mayo Clinic showed in a classical work that the antibiotic is effective against acute forms of tuberculosis. In most of the pulmonary cases, however, it produces resistant strains after two or three administrations. Prof. Chain also dealt at length with the phenomena of synergism in the action of antibiotics. A combination of penicillin and streptomycin has proved efficacious, while aureomycin with penicillin did not prove advantageous. Aureomycin and terramycin were instances of agents which had proved active against some viruses. It would appear that more antibiotics are needed urgently for the treatment of pulmonary tuberculosis and the virus diseases. Further advances will no doubt depend on fundamental progress in the field of chemical microbiology.

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