

Dr. A. E. Trueman and Dr. J. Weir's extensive work on British Carboniferous Non-marine Lamellibranchiata. Mrs. E. M. Knox has continued her work on the spores in coal, Miss D. Elrich, at the University of Budapest, has investigated industrial conditions in Hungary, Mr. Gilfillan the social and economic development of Dumbartonshire in the nineteenth century, and Miss A. M. Keay a study of the Forfeited Estates Papers in H.M. Register House, Edinburgh, with the view of elucidating the effect of the policy of the Commissioners on the social and political organisation of the Highlands during the eighteenth century.

The report of the superintendent of the Laboratory of the Royal College of Physicians, Edinburgh, pays a tribute to the work of Lieut.-Colonel W. F. Harvey, who was in charge of the Histopathology Department for twenty years and whose death on September 11, 1948, was a great loss to the Laboratory. Research on the chemotherapy of cancer using transplantable tumours in mice continued, while in biochemistry the discovery of new chemotherapeutic agents was again a chief objective. Some *p*-phenanthroline compounds proved to have considerable action against avian malaria, and the preparation of chloro derivatives has been completed. Work has also continued on the synthesis of *p*-phenanthroline compounds containing two basic side-chains, and a number of benzthiazole derivatives, chiefly 6-nitro- and 6-amino-2-styryl derivatives, have been prepared for test for antifilarial activity. The synthesis of benzthiazole compounds has been the chief concern of Dr. J. E. McKail.

CHEMOTHERAPY OF TUBERCULOSIS

THE fourth meeting of the Fine Chemicals Group of the Society of Chemical Industry was held at King's College, London, on January 18, with Sir Jack Drummond in the chair. A discussion on "The Approach to the Chemotherapy of Tuberculosis" was opened by papers by Dr. James Walker and Dr. F. D'Arcy Hart, both of the National Institute for Medical Research.

Dr. James Walker said that the limited knowledge of the metabolic processes of the tubercle bacillus has made an empirical approach to chemotherapy inevitable; but research has been aided by the use of wetting agents, such as 'Tween 80', and the addition of serum albumin to liquid media, which make it possible to obtain visible growths from minute inocula of the organism. Compounds at present under trial include the sulphones, which probably exert their action in the body by slow hydrolysis to diamino-diphenylsulphone; the diphenylamine *o*-carboxylic acids which act as antioxidants in certain biological oxidation mechanisms, and which have shown some inhibitory activity *in vitro*; and the di-alkylsuccinic acids and other substances with lipophilic terminal groups, which may aid penetration of the drugs into the lipid-rich bacillus. Various antibiotics have been tried against the tubercle bacillus, the best so far being streptomycin.

Dr. D'Arcy Hart said that sulphethrone and its analogue promizole, the least toxic of the sulphones, have produced some regression in the acute forms of human infection, and calciferol has brought about dramatic and consistent improvements in lupus

vulgaris. Streptomycin has proved life-saving in a proportion of cases of tuberculous meningitis and miliary tuberculosis, hitherto invariably fatal, and it is useful in less serious forms of the disease. Its clinical use is limited by its toxicity and by the drug resistance which develops in some patients under treatment. Lastly, *p*-aminosalicylic acid has shown promise and is under trial in Great Britain, both alone and in conjunction with streptomycin.

Much yet remains to be done; but chemotherapy has already given a new edge to the sword of established practice, and the time may not be far off when tuberculosis will cease to be the greatest destroyer of useful lives in Western civilization.

CORRELATION OF EVOLUTION OF HOST AND ECTOPARASITE

UNDER the title "Fahrenholz's Rule in Ectoparasitism", Dr. W. Eichler, of Ascherleben, Germany, contributes an interesting paper to *The Annals and Magazine of Natural History*, Series 12, No. 8 (August 1948). It has long been known that the natural classification of some groups of animals of parasitic habits corresponds with that of their hosts. Since Fahrenholz was one of the chief protagonists of this rule (in regard to the Anoplura in particular), the author has named this general principle "Fahrenholz's Rule". It applies, for example, to certain groups of ectoparasites and their hosts. Fahrenholz argued that the ancestors of extant parasites must have been parasites of their original ancestral hosts, evolution of host and parasite consequently having gone on side by side. The conclusions drawn from the classification and relationships of many groups of parasites enable light to be thrown on the natural relationships of their hosts—even in cases where the latter show very divergent features from other members of their group.

One of the best examples of the working of this principle is in the case of the flamingo—a bird which is placed by some ornithologists among the ducks, whereas others relegate it to the storks. Those who think it to be a duck explain its long stork-like legs as convergence owing to similarity of habit. Others maintain that it is, in fact, merely an aberrant stork, whose duck-like bill is the result of convergence. The evidence afforded by the parasites of flamingoes strongly argues in favour of their derivation from those of ducks. Thus the bird lice show in the main a clear affinity with those living on the Anatidæ. The ostrich and rheas are only parasitized by bird lice and feather mites common to those birds. This evidence is also confirmed by the cestode and nematode parasites of those two groups of birds.

Szidat (1939) has shown in his studies of the life-cycles of Trematoda that primitive hosts are parasitized by primitive types of trematodes and specialized hosts by specialized parasites. He quotes the parasites of various vertebrates in support of his contention. In the trematode subfamily Asymphyliodorinae the hosts are fishes of the family Cyprinidæ, which have their developmental centre in East Asia. In this region some of these Trematoda occur among different genera of Cyprinidæ, but with the spread of these fishes to Europe the parasites become more specialized, with the result that they become restricted to a particular Cyprinid genus or, in one case, to a single species.