

for modern attractive book jackets. He also referred to the vexed subject of indexes, which was later a matter for discussion from the floor. It was a question of whether or not it was better for the author or a trained indexer to do this work. Mr. Thin went into detail on the various stages in the publication of a book, the necessity for a clear layout, illustrations to match the text, type faces to be used and so on. It was suggested to him that it would be useful if publishers were to print the bibliographical detail on the flyleaf and to indicate the font-type used. The first of these suggestions he thought to be a useful one, but doubted if it would be practical to elaborate on the type as in some books several fonts were used. Mr. Thin also went into the question of the age of books and stocks. One suggestion from the floor was that when a publisher saw his stock of a particular book running low he should consider the advisability of making a microfilm of it. He again spoke of the difficulty met in the publication of a translated version of a book. It was sometimes difficult to get the translator and the author to agree on the final version to be issued.

At the end of the first day there was some time given for discussion. In addition to the items already mentioned the question of the use of microfilm was also raised. It apparently is still not quite acceptable to the average scientist, who prefers paper in his hands. There was also some discussion on the need and methods for getting information over to the working man at the factory bench. Dr. Clow had found there was interest expressed in the broadcasts, but it was essential that the correct speaker was

employed to present the matter in an interesting way.

The second day of the conference opened with a talk by Mr. David Moncur, manager, Dunn and Wilson's, Falkirk. Mr. Moncur, who illustrated his talk with a series of transparencies, went into elaborate detail of the process of binding books and periodicals in Britain. He spoke of a recent visit to the United States where the process of binding had been streamlined but had poor effect. One library he spoke of had all its books bound in one colour, which was extremely monotonous to the eye. In Britain much is done to vary the colour. Mr. Moncur also spoke of the new trends in binding by the use of plastic sleeves and front boards.

The final paper of the day and of the conference was given by Dr. D. J. Urquhart, director of the National Lending Library at Boston Spa. He dealt with the availability and translation of foreign publications. He spoke on the building up of the National Lending Library and its endeavour to provide a 48-hr. service to borrowers. He pointed out that the person who worked in a sizeable research organization and perhaps had access to big libraries was better off than he who worked in a small industry remote from technical college and university libraries. He thought that the public libraries had a great responsibility to increase their guides to scientific literature, supplying the basic reference tools and using the resources available to them through Boston Spa. Reference was also made to the Russian translations held at Boston Spa and how they were available to borrowers.

THE EAST AFRICAN VIRUS RESEARCH INSTITUTE

IN his annual report*, the acting director of the East African Virus Research Institute, Dr. J. D. Gillett, explains that the middle of Africa is the home of many different virus diseases, particularly those which are transmitted to man by mosquitoes. It is not enough merely to study virus, vector and vertebrate host, including man, as separate entities. These, their predators and parasites, their associated plants and, indeed, the whole community of living things must be considered, together with the physical environment, as a single interacting system. It is only thus that one can begin to understand the nature of the complex factors which play a part in the maintenance of virus populations, and of the variations in these factors which lead to the infection of man from wild animals and bird hosts, or to the sudden occurrence of human epidemics. It is only by such a broad approach that explanations will be found for 'epidemic years'. While the paucity of technical facilities for virus research in Africa is well known, the richness in natural facilities is unsurpassed anywhere.

The approach to virus research in Africa must be mainly ecological. If, however, it is to avoid the danger of becoming merely descriptive, field observation must be supported by laboratory experiments whenever possible. Laboratory studies, if properly planned, can produce short-cut answers and suggest

valuable clues to complex problems of behaviour. It would be difficult to find a better place for this complementary approach to virus studies. New viruses are being discovered every year. Ten years ago these were mostly being recovered from wild populations of mosquitoes, and their importance to man was largely unknown. With the development of new techniques, however, emphasis has swung more and more to the human patients themselves as a source of new viruses, and now the Institution is in a position to find the cause of many fevers which previously would have been accepted as pyrexias of unknown origin. Many new viruses and virus strains are being discovered. Most of the fevers associated with these newly discovered viruses are relatively mild, or their unpleasant symptoms pass off without permanent after-effects. Apart from individual discomfort, their main importance would appear to be the economic loss to the country concerned that must accompany wholesale absence from work.

The most dramatic of these new virus infections has been the huge epidemic of o'nyong-nyong. This appears to have begun in Uganda in 1959, moved steadily forward in a south-easterly direction for about a year and then, coming up against natural ecological barriers to spread farther in that direction, halted before breaking out in separate foci many hundreds of miles apart. The line of the initial advance depended on almost continuous permanent concentrations of the main vector, the malaria mosquito,

* East Africa High Commission. East African Virus Research Institute Report, July 1960-June 1961. Pp. ii+56. (Entebbe: East African Institute for Medical Research.) Sh. 3.

Anopheles funestus, and its limits and extent could be fairly accurately forecast by a study of endemic malaria conditions. Its present distribution in isolated pockets appears to have resulted from lines of human communication, such as steamers on Lake Victoria and railways from the lake ports. The appearance of the disease in epidemic form, however, has finally depended on the appearance of the main vector in high concentration, and of course, on a non-immune susceptible human population.

O'nyong-nyong virus is very closely related to chikungunya virus, which was isolated for the first time in 1953 during an epidemic in Tanganyika; the symptoms of infection in man are very similar indeed, and resemble those of dengue. Furthermore, infection from either virus produces haemagglutination, inhibiting antibodies to both viruses. It is interesting to note, however, that, so far, o'nyong-nyong virus has in every instance been associated with the two main malaria mosquitoes, *A. funestus* and *A. gambiae*, whereas chikungunya outbreaks can appear in the absence of these species. Moreover, both o'nyong-nyong and chikungunya are occurring in contemporaneous, but spatially separated, epidemics. If these two agents are merely variants, does the insect host play a part in bringing about

selection for one or the other? Are these extra-human cycles in other vertebrates, and, if so, are they the same for each virus?

Dr. Gillet indicates that the most important development of the year has arisen from the observation that the distribution of a malignant lymphoma in African children coincides with that of certain arthropod-borne diseases such as yellow fever. Thus a possibility exists that this revolting fatal disease is arthropod-borne, or at least associated with arthropod-borne disease. This is at present no more than a slender clue, but one which is being followed up vigorously. Work on this important subject is likely to proceed if the close collaboration of a team of cancer experts can be secured. In the meantime, the investigators have been screening several sera from cases and relatives against a range of viruses, in an attempt to demonstrate antibodies that would indicate previous implication of an arthropod-borne virus. So far, these have given largely negative results, except for Bunyamwera virus, where antibodies have been demonstrated in a suggestively high proportion. Further information is urgently needed on the general distribution of Bunyamwera antibodies in the human population before any conclusions can be made.

THE REGIONAL RESEARCH LABORATORY, HYDERABAD

THE annual report for 1960-61 of the Regional Research Laboratory, Hyderabad, follows the broad pattern of previous years*, but the presentation is addressed more particularly to the general reader. Lists of publications during the year and of patent applications filed and accepted are appended, as well as of staff and of members of the Executive Council and its sub-committees.

Work in the Division of Oils and Fats included hydroxylation and descriptive studies on castor oil, ricinoleins as surfactant bases, the processing of cotton-seed and tallow-like products from cotton-seed oil, the hydrogenolysis of fatty acids, fat-splitting and distillation of fatty acids, and fundamental studies on autoxidation. In the Division of Surface Coatings and Pigments, besides fundamental studies on dehydrated castor oil, the styrenation of drying oils, the preparation of long oil alkyds from drying-oil fatty acids, of emulsion paint vehicles from alkyds, and of varnishes from cashew nut-shell liquid and drying oils, the use of styrene-cardanol co-polymers in surface coatings and exposure tests for composite aluminium, red lead and other conventional primers were all investigated.

In organic chemistry some twenty-one *N*-(alkylaminoalkyl)-1:2:3:4-tetrahydroquinolines were synthesized for pharmacological examination, a number of *N*-dialkylaminoalkyl- β -phenylethylamines were prepared, as well as terpineol and terpin hydrate from 3-carene and pimenes. In entomology, the mechanisms of synergism of sesamin, 'Sesoxane', piperonyl butoxide and other insecticides were examined, as well as the mechanism of physiological action at different temperatures of toxaphene and

pyrethrum, and the effect of X-rays on the biology and biochemistry of the spermatozoa of insects and mammals. The mechanism of biosynthesis of itaconic acid was further examined, as well as the uptake of phosphorus-32 and of labelled glucose by *Escherichia coli* in the logarithmic phase of growth, the nucleic acid and protein metabolism of liver cells in suspension. Electrophoretic studies of proteins before and after treatment with acid and studies of the metabolism of proteins and nucleic acid in bovine spermatozoa also continued.

Other work was concerned with the utilization of Indian cotton linters, the production of hand-made paper of high bursting strength, the recovery and fractionation of tar acids from tar oils and ammoniacal liquor, the chemical examination of tar acids from low-temperature tar, distillation characteristics of low-temperature tars and pilot-scale distillation of these tars, as well as low- and medium-pressure hydrogenation of low temperature tars and oils. Electrode binder and electrode coke were prepared from these tars, and spectrophotometric studies made of tar acids obtained by low-temperature carbonization. Further work was carried out on the production and development of active carbons and on bleaching earths for vegetable and mineral oils. A molybdenum cobalt oxide on alumina catalyst was prepared for the hydrogenation of tar oil as well as one on silica alumina and a nickel oxide on alumina catalyst. Other work was concerned with the hydrolysis of titanium salts, the preparation and properties of butyl titanate, white cement, the synthesis of silicon carbide, active carbons for water treatment, the treatment of boiler feed water, vapour-phase esterification, and design and development studies on benzyl chloride, phenylacetic acid and phenylacetamide.

* India: Council of Scientific and Industrial Research. Regional Research Laboratory, Hyderabad. Annual Report, 1960-61. Pp. xii + 118. (Hyderabad: Regional Research Laboratory.)