

and J. Harrison (Wildfowlers' Association of Great Britain and Ireland) presented a broad and sympathetic survey of the problems of water use. Anglers and bird watchers can be reconciled, he claimed, if the anglers are restricted to specifically designed sites on the bank, screened by trees and bushes. I wonder how the anglers react to such a screen when trying to make a cast.

Reconciliation is still a long way off. Zoning of the larger lakes, such as Loch Lomond and Llyn Tegid in which certain activities are restricted to specific areas, is successful at some sites, but requires unselfish cooperation from all water users. Smaller sites may have to be reserved for single activities. This will still create arguments over priorities, for England and Wales contain only 300,000 acres of water space and conservationists assure us that 94% of southern grade 1 and grade 2 conservation sites are currently used for recreation. □

Tsetse ecology and behaviour

from a Correspondent

A Study Workshop on the ecology and behaviour of tsetse flies was held in Nairobi on September 28—October 2, 1976. It was organised by Professor T. R. Odhiambo, Director of the International Centre of Insect Physiology and Ecology, Nairobi.

THE objectives of the workshop were to assess the state of current knowledge in this field, and on that basis to formulate plans for future research with specific reference to the possible development of acceptable methods of controlling the tsetse vector of trypanosomiasis.

Scientific sessions opened with a review of current knowledge of tsetse ecology by A. M. Jordan (University of Bristol), who emphasised the need for a quantitative appraisal of mortality factors operative in natural tsetse populations. This was followed by accounts of recent work on the ecology of an atypical, peridomestic populations of *Glossina palpalis* in lower Zaire (P. van Wettere, WHO, Upper Volta) and of *G. tachinoides* in West Africa (D. A. T. Baldry, WHO, Geneva); and of typical populations of *G. swynnertoni* in Tanzania (S. K. Moloo, ILRAD, Nairobi), of *G. morsitans morsitans* in Zambia (S. N. Okiwelu and L. C. Madubunyi (University

of Nigeria, Nsukka)) and in Botswana (R. Allsopp, COPR, London), and of *G. pallidipes* in Kenya (J. van Etten, ICIPE). A dominant theme throughout was the possible occurrence of genetically distinct populations within a species, characterised by differences in host preference and other aspects of behaviour which might affect vectorial capacity. With regard to the peridomestic populations which could assume increasing importance in the context of developing Africa, the possibility of reducing challenge by appropriate modifications of livestock management practice, or by limited but highly selective application of insecticides, should clearly be investigated.

Recent developments in tsetse genetics were reviewed by W. Helle (Universitat van Amsterdam), who concluded that empirical studies of tsetse genetics would have an important part to play in the assessment of possible genetic differences between populations, and in guarding against the occurrence of undesirable genetic drift in colonies destined for use in sterile-male release programmes (such as the current Tanga project, which was later described by the project leader, L. Williamson (Tsetse Research Project, Tanga, Tanzania)). L. P. S. van der Geest (Universitat van Amsterdam) presented preliminary results of his isoenzyme investigations, reporting that different laboratory colonies could be shown to differ substantially in the relative frequency of alleles at the leucine-alanine peptidase locus. The importance of extending studies of this kind to natural populations of tsetse flies was agreed.

The session on tsetse behaviour was opened by J. Brady (Imperial College, London), who reviewed work on endogenous rhythms in tsetse flies, and described an analysis of available field data on diurnal patterns of activity in terms of an interplay between endogenous and environmental factors, emphasising the importance of a close integration of field and laboratory investigations. The need for a close study of the "medium range" reactions of tsetse flies to their hosts (as opposed to the long-range olfactory and the short-range thermal and gustatory reactions) was brought out; this, too, was the main theme of G. A. Vale (Department of Veterinary Services, Salisbury, Rhodesia) in his discussion of sampling techniques, where the effectiveness of different sampling methods for different components of the tsetse population and for different species was shown to be closely related to this aspect of behaviour. Vale also reported that investigations were in progress to explore the possibility of using the long-range attraction of tsetse flies to host odours as a basis for a sterile-male

release programme based on the capture, rather than on the rearing, of male flies.

A new dimension was introduced by J. Keiding (Danish Pest Infestation Laboratory, Lyngby), who described aspects of the biology of *Musca domestica* in Denmark, and showed that many features of its biology had been capable of convincing interpretation on the basis of results obtained from a range of relatively simple laboratory experiments. It was agreed that similar work could usefully be carried out with the newly emerged tsetse fly, which might represent a vulnerable stage in the life history. In the subsequent discussion, it was emphasised that in studies of tsetse behaviour due attention should be paid to the possible importance of group or social interactions.

A. Youdeowei (University of Ibadan) presented a paper on the salivation behaviour of the tsetse, based on a newly developed experimental technique, and the possibility was mentioned of interfering with trypanosome transmission at this stage of the cycle. This was followed by a discussion by T. Jaenson (University of Nairobi) of his recent work on the mating of *G. pallidipes*, which has long been recognised as a difficult species from the point of view of laboratory maintenance because of its recalcitrance to laboratory mating. The increased receptivity which characterised the first week in the life of adult females was shown to be associated with a corre-



A hundred years ago

A MEETING was recently held in Birmingham of the Council in connection with the projected aquarium for that town. We are glad to see that the arrangements for carrying the scheme into execution are well forwarded, and a Committee was appointed at the meeting to make all necessary preliminary arrangements. The proposed plan of the aquarium seems to us all that could be desired, and we are glad to see that Mr. Hughes, and other speakers at the above meeting, showed a laudable desire to make the institution serve important educational purposes; we hope, at least, that it will not degenerate into a second-rate music-hall and miscellaneous rendezvous.
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