all differently. It is interest and enthusiasm we are after in medicine—not the dead routine of a schedule. We need very badly pedagogic vitality. One man may make, or be able to make, twice the progress of another in a certain subject. Why tie him to the class schedule? Why not take him into your own laboratory, for his class periods, give him an assignment of special work, and talk it all over with him. It is a stimulus to students and teachers. It makes for progress in the student, not for stagnation. It widens his perspective, and not infrequently wakes the teacher. A schedule is made for the general mediocrity, and in its planning visibility is a prime necessity.

PAUL G. WOOLLEY,
Dean
COLLEGE OF MEDICINE,
UNIVERSITY OF CINCINNATI

A PROPOSAL FOR THE CONTROL OF CERTAIN MOSQUITOES

WITH the discovery that a number of diseases are transmitted solely by certain mosquitoes the control of these insects has become an important problem. But for successful control work exact knowledge of the species involved and of their habits is essential. Until a decade ago Réaumur's admirable presentation of the life history of the common house mosquito (*Culex pipiens* L.) has been almost universally considered applicable to mosquitoes in general. Nothing was known of the specialization of habits in the different species and it was generally supposed that in temperate regions all mosquitoes hibernated in the adult female condition, to deposit eggs and start a new generation with the return of warm weather. Students of the group now know that there is great diversification of habits and that the old generalizations apply to but a very small proportion of the many species of mosquitoes. Nevertheless, the old ideas persist with many and are still disseminated in well-meant attempts to popularize the subject. One often encounters recommendations for mosquito-control based upon these old ideas and leading to failure and useless expenditure.

The greatest misconception is that swamps and bodies of stagnant water in general continue to produce mosquitoes in quantities throughout the warm months and that to reduce mosquitoes it is only necessary to oil or petrolize such places at sufficiently frequent intervals. In fact the bulk of the mosquito population of our northern woods and swamps (and this is true of Eurasia as well as of North America) is derived from larvæ which develop in the snow-water of early spring. During a short period all the lesser bodies of water swarm with mosquito-larvæ, to shortly become, for the remainder of the season, practically barren. The larvæ hatch from eggs which were deposited the previous summer on leaves or rubbish in depressions of the ground. There is but a single brood and the larval period is short; the female imagos are long-lived (weeks and even months) and the egg-stage lasts through the winter to the following spring.

The species of mosquito which conform to the old idea, hibernating as female imagos and producing a series of generations during warm weather, are, in temperate regions, few in number, and their control is comparatively a simple matter. It is true that in villages, towns and cities even in the northern states these Culex mosquitoes will breed in tin cans and bottles on waste lots, in cesspools, rain-water tanks, rainwater barrels and other receptacles, and cause much annoyance. A community wishing to rid itself of such mosquitoes must carry on a warfare directed against these particular mosquitoes.

The species hibernating as eggs and developing in early spring (mostly belonging to the genus *Aëdes*, sense of Dyar and Knab) are, on the contrary, numerous in species and individuals, and under suitable conditions very annoying. Their control, through destruction of the larvæ, is a difficult matter. Petrolization, the method most recommended, must be carried out at just the right time. As the larvæ occur in practically all the numerous pools of snow-water scattered through woods and fields, operations will have to be very extensive to bring appreciable results. More-

over, in exposed places the wind is sure to drive the film of oil to one side and make it more or less ineffectual. It therefore appears that oiling for the control of these mosquitoes is not practical. Drainage, in many cases, can not be considered on account of the numerous small pools in which the larvæ occur.

The difficulty apparently has been solved in a recent suggestion by Dr. Adolf Eysell.[1] Discussing a recent pamphlet on mosquitoes by P. Sack, he criticizes the antiquated views and states that in Germany only three species of mosquitoes, *Culex pipiens, Culiseta annulatus* and *Anopheles maculipennis,* hibernate as imagos and that these are distinctly house-mosquitoes. All the other species, including two of Anopheles, are "wild" and hibernate in the egg or larva state. For the control of those hibernating as eggs Eysell suggests an easy method which should prove effective. It is the removal and burning, late in the autumn, of the old dead leaves and plant débris from the dried-out pools in which the larvæ would later appear. He further suggests that when it is inadvisable or impracticable to burn the egg-bearing leaves they be stacked on higher ground in such a way that they can not be carried back into the depressions by wind or rain. The latter method appears less effectual to the writer on account of the difficulty, at least in many localities, of finding permanently dry spots for such plant-rubbish. When one considers the very small amount of water that is necessary for the development of mosquitoes (the writer has found larvæ and pupæ in puddles less than an inch deep on practically level ground) and the possibility of heavy rains hatching the eggs and carrying away the young larvæ, this method seems less promising. The burning of the accumulations of leaves and rubbish from depressions of the ground, however, should give the best results. It is to be hoped that some one in a locality with well-determined mosquito conditions will give this method a fair trial.

Frederick Knab

Bureau of Entomology

[1] *Entomol. Mitteilungen,* Vol. I., No. 11, November, 1912, p. 366.

SCIENTIFIC BOOKS

Comparative Anatomy of Vertebrates. By J. S. Kingsley, Professor of Biology in Tufts College. Philadelphia, P. Blakiston's Son & Co. 1912. Pp. 401.

The author's purpose in writing this text-book, as stated in the preface, is to present a volume of moderate size which may serve as a framework around which the facts learned by the student in laboratory work in vertebrate anatomy may be grouped so that their bearings may be readily recognized and a broad conception of vertebrate structure may be obtained. "In order that this may be realized embryology is made the basis, the various structures being traced from the undifferentiated egg into the adult condition." "There has been no attempt to describe the structure of any species in detail, but rather to outline the general morphology of all vertebrates."

The task of preparing a text-book of this kind limited to a volume of moderate size is extremely difficult. Morphology, unlike physiology, or unlike chemistry or physics, lends itself to relatively few broad generalizations that may be stated without reserve. It deals essentially with data concerning the structure of a vast number of individuals in the adult condition and their development. While organisms are more or less readily classed into various broad and narrow groups according to the details of their structure and the genetic relationship of organisms, on the whole, may be most readily deduced from structural resemblances, nevertheless it remains true that living things are essentially individualistic in the character of their organic structure. Generalizations concerned with the structure of the tissues are much broader than those concerned with gross organic structure. The relatively simple conditions characteristic of the early stages in embryonic development also lend themselves to comparatively broad generalizations. The author, therefore, does well to devote rather more attention to the histological and embryological aspects of the subject than is customary in text-books of this character.