be concerned, as is neonatal, with the child, and postpartum with the mother.

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A Chamber for Observations on Living Larvae of Anopheline Mosquitoes

IN CONDUCTING certain physiological and toxicological studies on the first two instars of *Anopheles quadrimaculatus* Say, the larvae had to be kept relatively quiescent and observed with a minimum of disturbance for long periods of time under high magnification. In addition, in some experiments, control of the temperature was important.

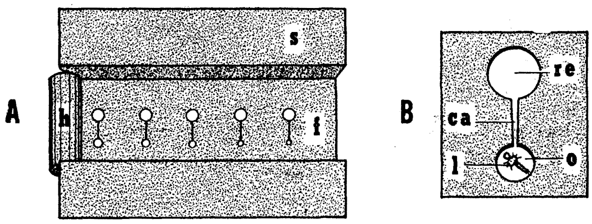

FIG. 1. A, aluminum insert (top view) which fits into an electric microscope stage incubator. B, enlargement of a portion of the floor of the insert. *f*, Floor of insert; *h*, case around thermometer of stage incubator; *s*, side arm supports of insert; *o*, observation cells; *ca*, connecting canal; *re*, reservoir; *l*, larva.

The problem was solved by the design of a simple chamber in which larvae are suspended in hanging drops of water or other test fluids. The chamber, shown in Fig. 1, is formed of two parts: (1) A metal insert that fits snugly into (2) an ordinary electric microscope stage incubator (manufactured by the Fisher Scientific Company). The insert (*A*), fashioned from an aluminum sheet 1 mm thick, is $75 \times 55 \times 12$ mm. One portion of the insert (*h*) encases the thermometer bulb of the Fisher stage incubator. A series of holes, 0.5–3.5 mm in diameter, is bored through the floor (*f*) of the insert to serve as observational cells (*o*) for larvae. Each of these is connected by a small canal (*ca*) (0.5 mm wide) to a hole 3 mm in diameter, which serves as a reservoir (*re*) for water or other test substances.

An ordinary medicine dropper with a narrowed tip is used to place larvae in the observation cell (*o*) and to fill the reservoir and the canal. Larvae tend to remain remarkably quiet within the hanging drops in the open observation cells. This arrangement permits detailed observations on intact organs of the larvae at magnifications of 400 diameters.

To prevent quick changes in temperature in studies where this is a critical factor, it is necessary to cover the assembled chamber. A plexiglass sheet was found suitable. Since this sheet tends to fog, it is necessary in some experiments to make a small opening in it in order to observe the larvae. When the cover is in use, larvae can be observed at 75 diameters with a dissecting microscope, but for higher magnifications with the compound microscope it is necessary to remove it.

This chamber, suitably modified if necessary, might profitably be used to study a number of problems pertaining to mosquito larvae and possibly to a number of other aquatic organisms.

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The Biological Activity of Mixtures of Lycomarasmin and Glutamic Acid, Glutamine Glutathione, or Cysteine

LYCOMARASMIN, isolated from culture filtrates of *Fusarium oxysporum* f. *lycopersici* by Clauson-Kaas, Plattner, and Gaumann (*1*), has been postulated to be an active toxin in *Fusarium* wilt of tomatoes. It is a dipeptide, and its structure has been determined by Woolley as N-(α-(α-hydroxypropionic acid))-glycylasparagine (*2*).

Strepogenin, a peptide of glutamic acid, augments the growth of *Lactobacillus casei*, as also do glutamine and glutathione (*3*). Because strepogenin reduces the toxicity of lycomarasmin to tomato cuttings, and lycomarasmin reduces the activity of strepogenin on *L. casei* (*3*), Woolley has suggested that lycomarasmin may be an inhibitory analogue of strepogenin (*3, 4*). On this basis one would expect glutamine and glutathione to reduce the toxicity of lycomarasmin to tomato cuttings; in fact, Albert has stated that the high cost of glutathione is all that prevents its use to control Fusarium wilt of tomatoes, said to be caused by the analogous polypeptide lycomarasmin (*5*).

Another suggestion for a lycomarasmin antidote comes from studies of the effect of patulin on living cells by Miescher (*6*). Miescher has pointed out that patulin, being inactivated by compounds containing free SH groups, probably reacts with essential metabolites containing SH groups and with SH-containing enzymes. Patulin affects cells somewhat similarly to lycomarasmin (*7*). Glutathione is an essential metabolite in many cells and, if lycomarasmin should be toxic because of its reactivity with SH groups, it will be inactivated by both glutathione and cysteine.

Either of these hypotheses, if correct, might lead to control of any portion of the syndrome of Fusarium wilt of tomatoes, which is caused by lycomarasmin; therefore, the authors investigated the ability of glutamic acid, glutamine, glutathione, and cysteine to reduce the toxicity to tomato cuttings of lycomarasmin in the presence of iron, which potentiates the toxicity of lycomarasmin (*1*).

Lycomarasmin[1] was mixed with ferrous or ferric sulfate and with water, glutamic acid, glutamine, glutathione, or cysteine. The concentration of each component of the mixture was 0.001 *M*. A small tomato

[1] Crystalline lycomarasmin was obtained through the kindness of Ernst Gaumann.

cutting was then set in each mixture, and toxicity to the cutting was observed after 18 hr. A positive nitroprusside test in solutions containing cysteine or glutathione with lycomarasmin and ferrous (but not ferric) ion indicated that free SH groups were still present after 18 hr, which was at least twice the time required for the cutting to absorb a toxic dose of the lycomarasmin-iron complex.

The toxicity to tomato cuttings of the ferro- or ferri-lycomarasmin complex was not decreased by glutamic acid, glutamine, glutathione, or cysteine. This was true regardless of the order in which reagents were added. Evidently lycomarasmin is unable to react with metabolites containing SH groups, such as cysteine or glutathione, and is not an antimetabolite for glutamic acid, glutamine, or glutathione.

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References

1. CLAUSON-KAAS, N., PLATTNER, P. A., and GAUMANN, E. *Ber. schweiz. botan. Ges.*, **54**, 523 (1944).
2. WOOLLEY, D. W. *J. Biol. Chem.*, **176**, 1291 (1948).
3. *Ibid.*, **166**, 783 (1946).
4. ———. *A Study of Antimetabolites.* New York: Wiley, 145 (1952).
5. ALBERT, A. *Selective Toxicity.* New York: Wiley, 56 (1951).
6. MIESCHER, G. *Phytopathol. Z.*, **16**, 369 (1950).
7. GAUMANN, E. *Advances in Enzymol.*, **11**, 401 (1951).

Book Reviews

Natural Communities. Lee R. Dice. Ann Arbor: Univ. Michigan Press, 1952. 547 pp. Illus. $5.50.

If it does nothing else, Dr. Dice's book should impress a reader with the extent and complexity of the subject of plant and animal communities. Characterized by a multiplicity of subheads, generalizations, and brief examples and discussions, its purpose is to introduce the student to principles of ecology and to stimulate further investigations of the little-understood relationships existing wherever life is maintained.

Although I am not sure that it is or ever will be within the ability of any one person to write of the broad field of ecology with more than passable adequacy—irrespective of how much space be used—the author has put forth such a comprehensive outline that it is hard to conceive of wholly complete omissions. He has, indeed, touched upon just about everything ecological that ecologists commonly think of! Furthermore, his treatment of most of the elementary material, and of at least some of the more advanced, seems to me unusually lucid, and particularly appropriate for undergraduate teaching.

My chief criticisms have to do with what might be called some of the more modern concepts. Certain shortcomings in this respect may be attributed in part to the natural difficulties of condensation and of keeping up with the accelerating progress of ecological and associated sciences in late years, but not all may thus be accounted for. As concerns various aspects of community equilibria, population dynamics, etc., I am disappointed that Dice has not recognized the increasingly voluminous evidences of resilience and compensatory or automatic adjustments that represent substantial departures from conventional ideas of the impact of living things upon each other. Instead of his depicting natural relationships as being so intermeshed that every change in the population status of organisms has its repercussions on all members of a community (the Darwinian view, in short), I think that he could well have shifted more emphasis to discussions of the remarkable facility with which populations often adapt to year-to-year changes in food supply, gross habitat, reproductive rates, and kinds and amounts of mortality. Better distinctions between the factors that truly delimit populations and those that operate only incidentally to population phenomena would have been highly desirable, in my opinion.

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Radio Astronomy. Bernard Lovell and J. A. Clegg. New York: Wiley, 1952. 238 pp. Illus. $4.00.

This book meets the need for an introductory text in radio astronomy. The reader is introduced to this new science by a pair of very able authors who have long been actively engaged in theoretical and experimental research in the field. Their writing style is lucid and concise. Mathematical treatment is held to a minimum but is adequate for a text of this type.

Most of the important work in radio astronomy has been performed since the end of the second world war. As stated in the preface: "The fundamental discoveries in this new science were made nearly twenty years ago, but it was the rapid development of refined radio techniques and the experience which physicists obtained in radar during the war, which eventually led to its sudden emergence from obscurity after 1945." During the past seven years a vast amount of work has been performed in this field by outstanding research teams in the British Commonwealth, the United States, and in other countries. There has been a steady flow of reports on radio meteors, radio stars, solar and cosmic radio noise, etc. Unfortunately, however, this wealth of information has been so widely dispersed among the scientific publications of the various countries that it has become increasingly more difficult to keep abreast of new developments.

The authors have succeeded rather well in organ-