While agreeing with the findings of Friedberg, Katz and Steinitz that the injection of renin produces a rise in the pulmonary artery pressure, our findings as to the details of this pressor effect differ from those of these authors, in that they found a greater percentage increase in pulmonary artery pressure than in systemic arterial pressure, which former rise was of shorter duration.

The pressor effect on the pulmonary artery pressure as described and illustrated in the figure is presumably due to one of, or a combination of, three causes: (a) bronchiolar constriction produced by renin; (b) a back pressure effect from the rise in systemic arterial pressure; (c) direct vaso-constriction, by renin, of the arterioles of the pulmonary circuit.

Further analysis of the cause of the effect is proceeding.

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¹ Katz and Steinitz, *Amer. J. Physiol.*, **128**, 433 (1940).

² Friedberg, Katz and Steinitz, *J. Pharm. and Exp. Therap.*, **77**, 80 (1943).

³ Helmer and Page, *J. Biol. Chem.*, **127**, 757 (1939).

A Culture Method for *Lymnaea truncatula*

THE amphibious snail *Lymnaea truncatula*, which serves as an intermediate host of the liver fluke, *Fasciola hepatica*, has been found in the past to be somewhat difficult to maintain in laboratory culture. In connexion with current work on the epidemiology of the severe disease of grazing animals which is caused by this parasite, one of our first problems was to establish satisfactory means of culturing the snail. Our attempts have proved so far successful that we are able to grow the snails in unlimited numbers, at different seasons of the year and to a larger size than they usually attain in their natural habitat.

On account of the particular interest of this mollusc and its association with *Fasciola hepatica* in the teaching of biology, as well as for the benefit of research workers in the field of parasitology, we felt that a description of the culture method might be of interest and value.

Having met with little success by aquatic culture methods, we proceeded with an attempt to reproduce in glass and earthenware vessels the natural habitat of the snail. This habitat comprises the small open

mud flats that lie between pools of shallow water and low grassland. Finally, we developed the following technique. Unglazed earthenware pans, without holes in the bottom, 12–18 in. in diameter, of the kind used by nursery men serve as containers for the mud. Before use the pans are soaked for some days in pond water, then they are dried and coated, on the outer surface only, with paraffin wax, in order to prevent undue loss of water by evaporation. The mud which is to form the substratum of the culture is mixed with pond water in such proportions as to give it a wet plastic consistency. It is then sterilized by heat to destroy unwanted trematode infection and is placed in each pan in such a way as to form an even slope extending from near the upper lip on the one side to the floor of the pan on the other side. Depressions are made on the surface of the slope in several places, simulating on a small scale the footprints of animals, and sufficient pond water is poured over the surface of the mud to form a small pool at the bottom of the slope. The pan is then covered by a piece of glass and placed in a greenhouse where there is abundant light, to encourage the growth of algae, and heat adequate for rapid development of the snails.

In two or three weeks the mud becomes covered with a thick growth of algae and is then ready for the introduction of the snails. A light sprinkling of a mixture of equal parts of finely powdered natural chalk and fine oatmeal flour is applied to the surface of the mud at weekly intervals. This supplement to algal food, along with the addition of distilled water which is poured over the surface of the mud to make up for slight loss by evaporation, is all that is needed for the maintenance of the culture. It is important that the water and the mud should be of the most suitable kind for the culture of this snail, and it has been our practice to collect the mud from a heavy clay soil on which the snails are found to thrive particularly well in the natural state. The water used in the first preparation of the mud slope and for the first pool in the culture dish is also collected from this natural habitat. The sterilization of the mud is only carried out to eliminate unwanted fluke infection for the purpose of our particular work, and might not be necessary for ordinary purposes.

Our experience has revealed a much more rapid rate of multiplication of this snail than we had anticipated, and maintenance of a culture is such a simple matter that there would appear to be every reason for developing its use in the teaching of biology for demonstrating the life-history of a trematode.

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Resistance to 'Inanition' in Grass Seedlings

RESISTANCE to 'inanition' in the early seedling stage of various species of herbage grasses when grown in competition with older established plants has been reported by Chippindale^{1,2}. Recent observations on perennial ryegrass (*Lolium perenne* L.) suggest that a similar resistance occurs in larger seedlings, nine to ten weeks old, both in competition with plants of the same age and species, and also