The source of material was a small pond at Ken Wood, London, containing beech leaf and twig debris. In maize meal agar plates, a fungus was observed which subsisted on aquatic amœbæ. The mycelium is extremely delicate and granular, with slight branching, diameter varying between 1 and 2 μ according to age. Amœbæ, 30–45 μ in diameter, are captured and a branched haustorium 10–30 μ in length is formed which persists until complete digestion is effected, when withdrawal of protoplasm occurs (Fig. 1). When the mycelium is well established, conidia formation occurs, and exposure to light seems to stimulate their formation. A short lateral enlarges and two distal forks appear, frequently one or both forking again (Fig. 2); less regular forking is of frequent occurrence (Fig. 3). At maturity, the distal portion of each fork appears devoid of protoplasm and is termed the appendage. The conidia have forks ranging from 15 to 40 μ in length.

This fungus agrees with the general description of *Acaulopage dichotoma* Drechsler, 1945, found in water-lily leaf inoculum, and is named accordingly.

I found a greater variation in the degree of forking of conidia than is reported by Drechsler, and no trace of the clear secretion which formed yellow deposits apparently produced by the fungus as an adhesive trap for amœbæ.

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[1] Drechsler, *Mycologia*, **37**, 1 (1945).

Osmoregulatory Capacity of Contractile Vacuoles

The view that the contractile vacuoles of Protozoa in many cases perform an osmoregulatory function has been supported by much evidence[1] which need not be repeated here. Recent observations carried out on the freshwater peritrich ciliate *Carchesium aselli* have demonstrated the remarkably close regulation of body volume which is achieved in spite of wide variation in the osmotic stress imposed by the environment.

In some experiments, in order that the internal osmotic pressure might be raised, the organisms were equilibrated with 0·05–0·5 molar solutions of ethylene glycol, which is known[2] to penetrate various cell membranes at a significant but not too rapid rate. On return of the organisms to water free from ethylene glycol, the contractile vacuole increased its rate of output immediately to from two to nine times the rate before treatment; but it subsided in the course of ten to twenty minutes to its normal level of activity, no doubt owing to the escape of the ethylene glycol from the organism. Greatly increased osmotic stress was thus met by increased vacuolar output, and the swelling which would be expected in the absence of osmoregulation was prevented or (after the higher concentrations of ethylene glycol) considerably restricted. Similarly, in experiments in which the organisms were immersed in solutions of up to 0·03 molar sucrose, which for short periods may be regarded as not penetrating in significant amount, the body volume remained unchanged (within the limits of observation) while the rate of vacuolar output was appropriately reduced.

The highly developed power of accurate osmoregulation which is therefore found in these ciliates may well be useful where the osmotic pressure of the medium is liable to fluctuate, as, for example, in estuaries. Apart from this, another important ecological aspect of this question may be suggested. It has been shown[3] for the egg of the sea urchin *Arbacia* that the rate of swelling on transfer to dilute sea water is considerably faster at higher temperatures, presumably because of increased permeability to water; and I have found this to be true also for the marine peritrich ciliate *Vorticella marina*. The Q_{10} for the permeability to water of the *Arbacia* egg has been estimated as ranging from 2·1 to 3·1 ('permeability' here including any changes which may occur either in the diffusibility of water or in the properties of the membrane); and that for *Vorticella marina* appears to be of the same order, although the precision of the results does not warrant a closer statement. But I have also found that the rate of vacuolar output of a freshwater peritrich increases with rise of temperature with a Q_{10} of $2\frac{1}{2}$ to 3.

It seems reasonable to postulate that the contractile vacuole responds to small changes in the hydration of the protoplasm, whether these arise from a change in magnitude of the osmotic difference across the body surface or from a change in 'permeability' of that surface to water, so that the rate of vacuolar output is adjusted to maintain a practically constant body volume. In its natural habitat a freshwater peritrich might be exposed to seasonal extremes of 0–20° C., and in some circumstances the diurnal fluctuations might amount to several degrees. It seems that the organism would have to grade its osmoregulation to meet these changes. This may apply also to other freshwater animals, and so prove to have a general ecological importance.

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[1] Kitching, *Biol. Rev.*, **13**, 403 (1938).
[2] Stewart, *Biol. Bull. Woods Hole*, **60**, 152 (1931).
[3] Lucké and McCutcheon, *Physiol. Rev.*, **12**, 68 (1932).

Course of Untreated Infections of *Litomosoides carinii* in the Cotton Rat

The efficacy of drugs in the treatment of human filariasis can be assessed by their effect on the microfilariæ in the peripheral circulation, and the effect on the adults merely inferred therefrom: in animals, however, the change induced in the adults can be assessed directly.

In recent years, *Litomosoides carinii*, the natural filarial parasite of the cotton rat, transmissible from rat to rat by the mite *Liponyssus bacoti*, has been studied in this laboratory and in others in Britain and America, with a view to its use for chemotherapeutic researches in filariasis. Much of the published work on the preliminary screening of drugs has been done with rats showing infections of unknown duration, naturally acquired in the field, and the results are interpreted as indicating that, while certain drugs kill the adult worms in the pleural cavity but do not affect the microfilariæ in the peripheral blood stream, the converse is true of other drugs, although, in some cases, only a transient reduction in the number of microfilariæ has been observed. Our observations on untreated laboratory-infected cotton rats over the past two years lead us