

RESPIRATION OF VORTICELLA

THE importance of oxygen tension in the life and active functioning of protozoa has been known and some investigations have already been carried out with certain forms of protozoa, such as *Bodo sulcatus*,¹ *Bodo caudatus*,² *Trypanosoma lewisi* and *Leishmania tropica*,³ and *Colpidium campylum*.⁴ The oxygen requirement varies with the type of protozoan and one of the highest so far recorded is that of *Colpidium campylum* (cultured in a bacteria-free medium containing only salts) one million cells of which consumed 112.5 cu. mm. of oxygen per hour at 19.8° C.

In the course of our studies on the role of protozoa in sewage purification, we had demonstrated the importance of adequate air supply in maintaining the activity of the protozoa, particularly the *Vorticellids*,⁵⁻⁷ which are mainly responsible for the purification. In view of the earlier observations of Buswell and others⁸ regarding the minimum oxygen requirement for efficient purification of sewage, it was interesting to determine quantitatively the actual oxygen requirements of the organisms responsible for the process. With this in view, the rate of increase of *Vorticella* sp. during aeration of raw sewage was first followed. The figures obtained with four independent batches are cited below.

Samples of raw sewage	Number of active <i>Vorticella</i> per c.c. after aeration of the medium for			
	24 hours	32 hours	40 hours	48 hours
1	720	1240	1460	1680
2	240	660	820	1100
3	480	880	980	1060
4	620	1100	1340	1500

The *Vorticella* sp. was isolated from the aerated sewage samples, and the protozoan cells were rendered free from the adhering bacteria by repeatedly washing them through columns of sterile water.⁹ A number of synthetic media were employed for the culturing of the protozoa, but none of them proved satisfactory. Satisfactory activity of the protozoa was noticed when, however, they were kept in a medium containing distilled water, aqueous boiled