firmed that the rotifers belong to the genus *Synchaeta*. Of the three species present, *S. baltica* Ehrenberg appeared to be most common, with ?*S. stylata* Wierzejski in moderate numbers and *S. curvata* Lie-Pettersen of rare occurrence. *S. baltica* is known to be abundant at times in the open sea (Rousselet¹). A red colour, found in the ganglion and eyespot, is typical of the genus *Synchaeta*. Other species in the samples were:

C 201 (5 per cent neutral formalin)

<i>Pleurobrachia pileus</i> Vanhöffen	very abundant
Polychaete larva	occasional
<i>Rhizosolenia styliformis</i> Brightwell	occasional
<i>Oscillatoria thiebautii</i> (Gom.) Geitl.	rare
Spore of <i>Goniadax digitale</i> ? (Pouch.) Kofoid	
(ident. E. J. F. Wood)	rare
A tintinnid: <i>Epiplocyis acuminata</i> Jørg.	
(ident. E. de Sousa e Silva)	rare
C 203 (deep-frozen)	
<i>Rhizosolenia styliformis</i> Brightwell	scarce
<i>Ceratium furca</i> (Ehr.) Clap. and Lach.	scarce
<i>Cerataulina pelagica</i> (Cleve) Hendey	rare
Spore of <i>Goniadax digitale</i> ? (Pouch.) Kofoid	rare
<i>Epiplocyis acuminata</i> Jørg.	rare

Immediately after the fresh sample was placed in a 1-lb. jar, a mass of red-coloured organisms, each about the size of a pin-head, was seen by Dr. Hurley to congregate about the surface of the sea water. While there is a possibility that the blood-red discoloration might have been caused by one of the other plankton organisms in the samples, the evidence in favour of *Synchaeta* seems more conclusive. It could be argued that a smaller dinoflagellate like a *Goniadax* spore was initially present in large quantities, but lost in the preservative. Against this, the spore was very scarce in the deep-frozen sample. Also, Braarud² found a *Gymnodinium* (*G. galathea-num*) dominant in a formalin-preserved sample collected by the *Galathea* in Walvis Bay, South-west Africa, on December 24, 1950. The fact that the dinoflagellate spore was rare in the Cook Strait material would seem to indicate that it did not contribute significantly to the strong colour. Bary³ has recorded discoloured water from this area, but in no case were rotifers cited as forming a visible bloom. Further, no mass mortality of fish or other organisms has been reported as a result of this bloom.

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¹ Rousselet, C. F., *J. Roy. Micro. Soc.*, **3**, 269; **4**, 393 (1902).

² Braarud, T., *Galathea Report*, **1**, 137 (1957).

³ Bary, B. McK., *N.Z. J. Sci. and Tech.*, **B**, **34**, 393 (1953).

Recovery of Adult *Amoeba lescherae* from Dried Cultures

IN 1950, Galbraith and Taylor¹ obtained adult *Amoeba proteus* from the brown powder formed when a culture of that species was allowed to dry. Galbraith has repeated the experiment; but hitherto, attempts to recover adults of *A. lescherae* from dried material have failed. A detailed description of these experiments has already been given^{2,3} and the behaviour of developing *Amoebae* of the *proteus*-type⁴ fully portrayed. This communication announces the successful recovery of adult *A. lescherae* by the following method.

Large numbers of young adults were introduced into 'Petri' dishes, 4 in. diameter, where they were allowed to increase by fission-divisions, and so, gradually, to age. The increasing size of the nutritive

spheres (= excretion spheres = refractive bodies) is indicative of the approach of the sporulation cycle; when they measure not less than 3μ in diameter the *Amoebae* are old enough to produce spores. It must be emphasized that only spores and encysted stages of development (see below) can withstand the vicissitudes of drying. An adult *Amoeba* (that is, of the *proteus* type⁴) does not form any protective covering for itself; it disintegrates as the culture dries up.

These cultures (well stocked with food organisms) consisting of mature *Amoebae* ready to sporulate are exposed to the air until completely dry. They are then covered with a bacteria-rich fluid. After a few days an examination of the 'Petri' dishes with a 4.4-mm. water immersion lens reveals the presence of amoebulae 5-6μ long hatching out of the spores. These feed on bacteria and grow. After a time, however, they encyst, remain quiescent and eventually excyst. Feeding follows, with a consequent increase in size, and again the creatures encyst. This phenomenon proceeds, with cysts measuring respectively 10-15-20μ in diameter. From cysts 25μ in diameter young adults emerge very transparent because of the few cytoplasmic contents. They feed voraciously, undergo fission and grow. The time required is 6 months.

Here it must be explained that, except under the most rigid control, no culture of *Amoebae* is exactly homogeneous as regards age. Especially is this true of cultures produced by method I³ or cultures obtained in Nature. Among the progeny of a single *Amoeba* some individuals race on and attain maturity before the rest. These sporulate, thus producing young encysting stages of development (see above) and these lie in the culture along with the rest of the inhabitants. It is therefore probable that in the experiments described above, because of the presence of encysted young, the first examination of the dried-up and wetted culture may reveal larger amoebulae than those hatching from the spores.

During the routine examination of the cultures which were recovering from the effects of desiccation I found 'activity' after some hours of daylight. In the early morning, cysts were more common than active *Amoebae*.

I have not succeeded in stemming the onset of encystment nor of shortening its duration. Galbraith (private communication) kept cysts of about 10μ diameter under observation for two years, after which they excysted and fed.

Under natural conditions this power to encyst possessed by the large free-living *Amoebae* of the *proteus*-group is clearly an adaptive character.

Spores are produced in late autumn or early winter—the onset of a favourable environment may cause the spores to hatch prematurely; a sudden return to winter conditions, lack of food, low temperature, desiccation would kill off the delicate amoebulae. Hence the necessity of this power to encyst at all levels of development. But it is difficult to understand why this characteristic cannot be broken down under laboratory conditions which can be adjusted to the needs of the *Amoebae*.

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¹ Galbraith, M., and Taylor, M., *Nature*, **165**, 938 (1950).

² Taylor, M., Hayes, C., and Galbraith, M., *Proc. Roy. Soc. Edin.*, **66**, Part 3, No. 15 (1957).

³ Taylor, M., *School Science Review*, No. 136 (June 1957).

⁴ Jepps, M. W., "The Protozoa, Sarcomandina" (Oliver and Boyd, Edinburgh, 1956).