

It may be noted that after the first fractionation the difference in balancing pressure between the first and last fractions was only about one part in 900.

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¹ *Proc. Roy. Soc.*, 126, p. 511; 1930.

The Supposed Resting Stage of *Limnocnida Indica* Annandale.

THE life-history of this fresh-water medusa has been a baffling problem since its discovery twenty years ago.¹ The jelly-fish occurs in certain rivers flowing down the eastern slopes of the Western Ghats of the Bombay Presidency during definite seasons of the year (March to May). What happens to the species during the rest of the year has been more or less a mystery. From the fact that it occurs year after year in certain parts only of these rivers, it has been supposed that there is a fixed asexual hydroid stage in the life-cycle of the animal, which buds off medusæ at the commencement of the hot weather.² Although

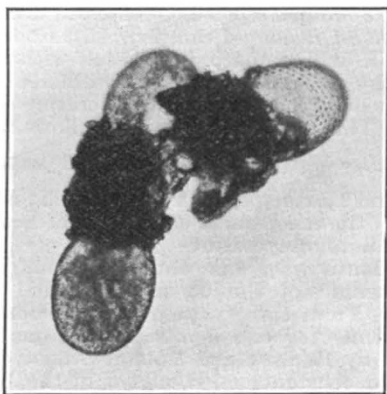


FIG. 1. $\times 50$.

the medusæ were kept under observation in the field, and a careful search for the hydroid stage made on more than one occasion, no clue to the mystery was obtained. Nearly eight years after the discovery of the jelly-fish, the late Dr. Annandale, as a result of further observations, recorded his opinion that the species "must have a fixed or resting stage in its life-history, perhaps with the structure of a minute hydroid, or more probably encysted in a form that would not be recognisable with our present knowledge".³

While on a recent tour to Medha (Satara Dt., Bombay), where the species was first discovered, I found certain very minute bodies in great abundance at the bottom of a deep rock pool in the course of the Yenna River, sticking to minute particles of mineral matter (Fig. 1). They are of different sizes (0.15–0.34 mm. in diameter) and in various stages of development, from the presumably early spherical form to the fully developed capsule-like or oblong form, but the latter are much more numerous than the early or intermediate forms. They have a transparent covering of apparently chitinous matter with pits and minute pores on the surface. The cavity of the body is more or less filled with refringent spherical granules in a clear, sticky, viscous fluid. In the early spherical form there are numerous minute elastic and sticky threads issuing through the pores on the surface

which serve to anchor it to particles of mineral matter. The more advanced oblong form is, however, attached by a short, stout, elastic stalk which is composed of minute threads of sticky material aggregated together with inclusions of foreign matter between them. The surface of the external covering is distinctly pitted, with traces of minute pores in each pit. In what appear to be the very advanced forms, the granular material forms a few large spherical masses clustered together like a bunch of grapes. It appears probable, from the occurrence of a few empty bodies with their external covering ruptured, that the spherical masses on completion of development within the capsule find their way out.

It will be of interest to add a chance observation which I have made on a small number of medusæ, male and female, from the Koyna River near Karad (Satara Dt., Bombay), kept in a small glass aquarium. At the end of the day of capture, a gravid female discharged its eggs, many of which settled down at the bottom of the aquarium. Examination of the eggs under the binocular microscope showed that they were attached to the bottom by means of minute elastic threads from the surface of the eggs. They were spherical in form, had a thin, transparent, apparently chitinous covering with minute pores, and were filled with a viscous fluid containing numerous refringent granules. The remarkable resemblance between the discharged eggs and the early stages of the so-called resting bodies suggests a clue to the life-history of the jelly-fish. Evidence to prove that the egg passes directly into the resting stage, and that the medusæ have their origin from the resting body without the intervention of a hydroid stage, is still incomplete. It seems probable, however, that the so-called resting bodies lie dormant during the rainy and cold seasons, and discharge their contents at the beginning of March in the form of very minute medusæ, which do not generally rise to the surface until they have attained to a comparatively advanced stage of development, and that a fixed hydroid stage is altogether omitted from the life-cycle.

These resting stages or bodies are still under observation, and a detailed account will be published in due course in the *Records of the Indian Museum*.

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¹ *NATURE*, 87, 1911, p. 144; and *Rec. Ind. Mus.*, 7, 1912, p. 253.
² Gravely and Agharkar, *Rec. Ind. Mus.*, 7, p. 403; 1912.
³ *Rec. Ind. Mus.*, 18, pp. 109–112; 1919.

Potential Temperature and the Stratosphere.

THE high coefficients of correlation between the measures of certain meteorological elements at the tropopause and the air-pressure at 9 kilometres cited by L. H. G. Dines in his letter in *NATURE* of May 30 may be welcomed as a reminder of the intricate but regular associations of the meteorological elements in the sequence of weather-changes which are so vexatiously irregular at the surface.

It is worth noting that, according to the data given by W. H. Dines, the 9 kilometre level is the level at which the relation of pressure to temperature along the horizontal is normally that of the dry adiabatic so that dry air might travel up-gradient or down-gradient, along the horizontal, without exciting any resilience.

I mention this because when Mr. Dines's letter refers to the enormous stability in the stratosphere on account of the isothermal condition in the vertical I am prone to think of resilience, and while allowing