insect implies that it is dangerous to assume that the mere presence of an isolable factor in the bee-dance necessarily means that it is used in communication.

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Feulgen-Positive Cytoplasm of *Molgula* Eggs

THE Feulgen technique has been used with success for chromosome studies in whole mounts of the eggs of marine animals such as *Arbacia* and *Chaetopterus*[1]. Hundreds of specimens can be fixed, stained and mounted in an hour or two—a fraction of the time and effort involved in an embedding-sectioning procedure.

Recently, in expectation of preparations suitable for scoring chromosomal aberrations (investigations supported by a U.S. Atomic Energy Commission grant to the Marine Biological Laboratory), I applied exactly the same methods to fertilized eggs from the ascidian *Molgula manhattensis*. To my surprise, the cytoplasm stained so deeply that nuclei and chromosomes were completely obscured. Several papers of historical interest[2] report intense cytoplasmic coloration of *Molgula* eggs with non-specific staining methods. However, deep staining with the classic means of demonstrating deoxyribonucleic acid was not expected.

A maturing series of oocytes carried simultaneously through the solutions demonstrated that the stainable material accumulated during maturation. Only mature oocytes stained deeply.

Substituting one fixative for another made little difference. The cytoplasm was Feulgen-positive if Gilson's fixative, which contains no aldehyde, was used instead of Kahle's fluid. Digestion with cold perchloric acid (10 per cent for 11 hr. at 4° C.) did not eliminate the cytoplasmic stainability. This is a recognized method of removing ribonucleic acid. The Schiff reagent was a standard batch which was performing normally in the staining of *Habrobracon* (wasp) eggs.

Brachet[3] has referred to positive Feulgen reactions of the ooplasm of higher chordates but was unwilling to admit that deoxyribonucleic acid could be responsible. Amphibian and hen eggs were outstanding examples. Since that time, scattered reports of cytoplasmic deoxyribonucleic acid or deoxyribosides have appeared for a variety of organisms[4], and a hypothesis has emerged that the cytoplasm serves as a deposit for nuclear building materials required promptly and in quantity during cleavage[5].

The cytoplasm of *Molgula* eggs suggests itself as material worthy of attention by biochemists interested in morphogenesis.

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Relation between Breeding and Ecdysis in Cirripedes

IN all major groups of Crustacea except in cirripedes it is well known that breeding is closely bound up with the moulting cycle. First, the male generally copulates with a female which has just moulted. Secondly, the moulting cycle is often interrupted while the eggs are being carried so that eggs are not lost by the shedding of the cuticle to which they are attached.

The Cirripedia are exceptional in being hermaphrodite and in having the egg masses lying free in the mantle cavity during incubation. As a result they do not necessarily lose them when they moult[1]. Crisp[2] suggested that a moult might be expected to accompany copulation as it does in other arthropods. Barnes and Barnes[3] later discussed the same idea, and without giving any definite evidence suggested that it occurred after fertilization.

During the past three years we have investigated six species of sessile barnacles, *Balanus balanoides* (L.), *Balanus balanus* (L.) (= *B. porcatus* da Costa), *Balanus crenatus* Brugière, *Balanus perforatus* Brugière, *Elminius modestus* Darwin and *Chthamalus stellatus* Poli.

In none of these species have we found evidence for a moult soon after copulation. On the contrary, the intermoult period is prolonged when the barnacle is carrying embryos, although the extension of the intermoult period is not absolutely regular. Normally ecdysis does not occur until after the young have hatched and escaped from the mantle cavity.

When hatching is delayed by withholding food[1] the intermoult period is further prolonged so that in the majority of individuals moulting still occurs just after liberation. Sometimes the moulting cycle seems to reassert itself before liberation; but the eggs still develop normally and a further moult usually occurs after liberation. Very occasionally developing eggs are ejected from the mantle cavity; but this usually occurs under abnormal temperature conditions and is not necessarily related to moulting.

In *B. balanoides* the breeding cycle is long and the period of anecdysis, which commences with the copulation in November, lasts until sometime between December and March, varying with the individual (Fig. 1). In this species the first cast skin after the period of anecdysis, irrespective of whether fertilization has occurred or not, contains all the tissues of the penis. The penis is thus separated by an abscission layer of new cuticle, and a new penis gradually