how to interpret the reduced speed. The animals were observed to survive for a number of days at 4°C. It would be interesting to study the animals from the same location in winter when they are acclimated to a low temperature.

No change in relative streaming velocity was caused by electric currents of magnitude just under that which made the animals withdraw into their shells. Magnetic field up to 50 gauss had no effect on the streaming velocity.

If the relative streaming velocity is indeed an invariant quantity, as is suggested by these experiments, it must be a manifestation of some fundamental process. To predict how the same process would manifest itself in other systems that are structurally different, it is necessary to have a model. A model that predicts an invariant relative streaming velocity from quantum mechanical traveling waves on long thin molecules (like F-actin) will be described elsewhere. An application of this model to gliding diatoms predicts that they would have a velocity of 18 μm/sec when they are moving at a steady rate. This prediction was verified for several different kinds of diatoms that were collected along with the foraminifera.

1973 #38

THE TIME OF APPEARANCE OF SPECIFIC PROTEINS IN EMBRYOGENESIS

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Protein extracts were prepared from a large series of early stages of zygotes and embryos of *Fundulus heteroclitus* as part of an extended program in the development of a catalogue of embryonal and adult proteins and their time of appearance in relation to morphogenesis.

At any particular stage aliquots of embryos (approx. 500) were selected and pulsed with ^{3}H-valine or ^{3}H amino acid mixture (20μCi/ml) for eight hours. Following the pulse the embryos were extensively washed and permitted to develop further.

At Stage 18-21 the embryos were homogenized in 0.15M sucrose and 0.01M Tris, pH 7.6 (2:1 v/v) in a teflon-glass homogenizing system. The chorions were removed by mild centrifugation and the crude homogenate was then further centrifuged at 105,000 x g for 90 minutes.

Following this the supernatant was collected and placed in SDS buffer (0.2 percent sodium dodecyl sulfate, 0.02 percent mercaptoethanol and 0.01M Tris at pH 7.0) in a v/v of 1 and heated in boiling water for 15 minutes.

The homogenates were dialyzed overnight against 0.2 percent SDS and 0.01 percent mercaptoethanol and 0.01M tris.

Samples were removed for the assay of bulk protein separation using SDS acrylamide gel electrophoresis. The remaining protein was stored at –40°C for further study.

Comparison of sample runs stained with coomassie blue indicated that the bulk proteins so displayed were remarkably similar in electrophoretic pattern. The subtle changes known to be occurring in embryogenesis are hidden within this pattern and are demonstrable only by isotopic incorporation patterns. These are currently under study using the frozen samples. Details of the technique and preliminary results are to be found in Schwartz, R.J. and Wilde, C.E., Jr., Nature 1973 (in press).
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