stirrer speeds and durations of measurement. The jelly coat is gradually abraded off without adversely affecting respiratory rate or condition of the eggs. The electode response is, however, critically influenced especially by the speed of stirring. The stirring motor must thus be operated under rigidly controlled voltage conditions. The type of electrode is not critical. Open platinum-tipped electrodes ground flush with the glass surface are to be preferred to recessed or collodium-coated ones because of their rapid electric response and their ease of cleaning. The latter point is of considerable consequence with the employed protein-contaminated suspensions. Occasional disturbance of the electrode diffusion gradient through accidental contact between egg and electrode is of little importance, and is always of short duration. The second electrode is a silver wire loop. The circuit is kept constantly polarized.

Maximal exhaustion of oxygen is effected in 30 mins. by 300,000 fertilized sea urchin eggs in sea water in a 2-3 ml. electrode chamber. A strictly constant respiratory rate prevails all the way down to 7-10 mm. oxygen pressure. Then respiration rapidly comes to a stand-still. Unfertilized eggs and sperms behave similarly. Eggs may remain at this low oxygen pressure for periods up to at least 20 mins. without injury to development or fertilizability. Definition of egg suspension density is, however, difficult when repeated experiments on the same stock suspension are desired. Sperm suspensions are, on the other hand, considerably more promising in this respect.

The Pigment of the Jelly Coat Granules of Sand-dollar Eggs

Hans G. Borei

University of Pennsylvania

Pigment granules from the jelly coat of the sand-dollar (*Echinarachnius parma*) egg were obtained by: (1) solvation of the jelly layer in acid sea water, (2) isolation of the granules by differential centrifugation, and (3) repeated washing and resuspension of the granules in buffered sea water. The granules were thereafter packed at high centrifugal speed, lyzed in distilled water or weak buffer (pH 7), and the stroma separated away.

Chromatographic adsorption on $CaCO_3$ from an ether solution of acid treated extract reveals 3 main components. The main portion (80-90%) is dark purplish. The remaining two fractions, which eluate faster than the main fraction, are respectively greenish yellow and venetian red. The latter resembles optically and chemically echinochrome A, which has previously been described from sea urchin eggs and ovaries, whereas the main fraction differs on many essential points.

The native pigment is bound to protein. In neutral extracts it is reddish purple and very stable. At lower pH it turns bright cherry red. Boiling in 4 N-HC splits the pigment-protein bond. In alkaline solutions

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the native pigment turns deep purplish and is rapidly destroyed, presumably by oxdation to a dark-greenish substance which tends to precipitate out. The native pigment as well as its prosthetic group have been optically characterized at different pH-levels in the range 220-1000 Mu. Isoelectric and isobestic points were established, and the salt-sensitivity, solubility and oxido-reduction properties studied. It was found that the native pigment and the prosthetic group differ markedly in most of their properties. It was also established that the pigment belongs in the general group of echinoand spinochromes, but that its properties are different enough to preclude its identification with any of the known members of the group.

It is interesting to note that the pigment is located in the jelly coat which is known to be the carrier of the fertilizine of the sea urchin egg. Fertilizine activity has previously been ascribed to pigments of the echinochrome group, which were isolated from sea urchin ovaries and from the egg cell itself. The claim of identity between echinochrome and fertilizine has, however, been disputed.

Role of Manganese in Sea Urchin Metabolism

Hans G. Borei and Frederick A. Dodge University of Pennsylvania and the Rockefeller Institute

The total Mn-content of the sea urchin material from the Maine Coast was found considerably lower than values reported from the European Atlantic Coast. A colorimetric micro-chemical method of analysis was used, whereas the European results were obtained spectrographically.

A Warburg-technique test-system was worked out for the analysis of the effect of trace-metal additions on the activity of the echinoderm oxidase system. It comprises mitochondrial fractions from echinoderm eggs in glycyl-glycine buffer + cytochrome c + DPN (or TPN) + pyruvate.

Further Studies on the Adrenalin Diuresis in Squalus acanthias

Saul Boyarsky*, Albert Biggs**, Julius J. Cohen, Robert Soley and Warren Brown New York University, University of Cincinnati, Yale University and Harvard University

Previous observations (Bull., M.D.I.B.L., 1954) on Adrenalin diuresis in S. acanthias were extended. With one exception, mature females

** Abraham Birsch Fellow in Medicine

^{*} USPHS Postdoctorate Fellow in Physiology