Pigments of Sponges

THE lipochrome nature of the colouring matters of the Porifera or sponges was recognized by Krukenberg[1] who refers to their carotinoid-like and rhodophane-like pigments, the latter being characterized by the possession of a single absorption band. Later spectroscopic study of the pigments of additional species by MacMunn[2] confirmed these observations.

More recently, Karrer and Solmssen[3] have isolated the Crustacean pigment astacene from the sponge *Axinella crista-galli*. They claim that this pigment is also present in *Suberites domuncula*, but this is at variance with an earlier observation of Kuhn, Lederer and Deutsch[4]. No other crystalline carotinoid had so far been isolated from sponges.

We are at present engaged on an investigation of the pigments of the red sponge *Hymeniacidon Sanguineum* (Grant). We have failed to detect astacene but have isolated two carotinoids, echinenone and γ-carotene in crystalline form. We have also obtained spectroscopic evidence of the presence of α-carotene. Echinenone was discovered by Lederer in 1935, who isolated it from the sea-urchin *Echinus esculentus*. Apart from β-carotene it was the first animal carotinoid found to possess vitamin A activity[5].

The demonstration of the presence of the pigment echinenone in sponges provides a chemical link between the otherwise unrelated Porifera and Echinodermata. It would also appear that this is the first occasion on which γ-carotene has been isolated from invertebrates.

We hope to publish a detailed account of this investigation elsewhere.

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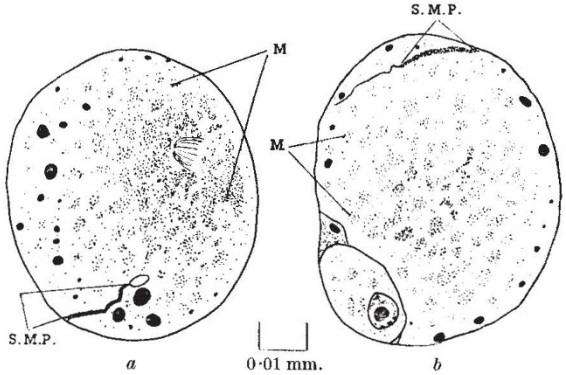
Presence of the Sperm Middle-Piece in the Fertilized Egg of the Mouse (*Mus musculus*)

DURING an investigation of the cytoplasmic inclusions of the fertilized egg of the mouse, the sperm middle-piece, and in some cases the whole tail, was observed in the ooplasm (*a* and *b*). The middle-piece usually becomes detached from the sperm-head shortly after the entry of the sperm, but may remain attached until the stage of the pronuclei is reached. The middle-piece is, at first, compact and deeply stained, but soon shows a granular structure. These granules are identified as the mitochondria of the sheath of the axial filament (*a*, *S.M.P.*). After the middle-piece is free of the sperm-head the sheath becomes less compact, so that the individual granules can be identified with ease (*b*, *S.M.P.*).

The sperm-mitochondria are slightly larger and are more deeply stained than those of the egg (*M*). At a later stage the mitochondria of the sperm stain in a similar manner to those of the egg; they now form a loose broad band, and are, later, distributed through the ooplasm.

Sperm-mitochondria were not identified during the



later phases of the stage of the pronuclei, or during the first cleavage division, or in the two-cell stage.

It is concluded that the sperm-mitochondria become similar in size and staining properties to those of the egg, that they are distributed through the ooplasm and, later, become arranged around the spindle, together with the egg-mitochondria, and are consequently transmitted in approximately equal quantities to the first two blastomeres.

There is also evidence that the Golgi material of the sperm is carried into the egg. It undergoes fragmentation and becomes indistinguishable from the Golgi elements already present in the egg.

The present findings do not support the work of Lams[1], Levi[2], and Van der Stricht[3], who claim that the sperm-tail of certain mammals is segregated into one of the blastomeres of the two-cell stage.

So far as I am aware, distribution of the sperm-mitochondria through the ooplasm before the first cleavage division has not previously been recorded in the eggs of mammals. Held[4] and others, however, have traced the history of the sperm-mitochondria in the cytoplasm of the ova of certain invertebrates.

The present findings are based on the examination of material fixed in Flemming's fluid (without acetic), and of material treated according to the method of Aoyama. It is hoped to publish a detailed account of the history of the cytoplasmic inclusions of the sperm in the cytoplasm of the egg of the mouse.

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Subjective Judgments of 'Firmness' in Elastic and Viscous Materials

IN the testing by handling of many industrial products showing both elastic and plastic properties (of which cheese is typical), direct comparisons of 'firmness' are regularly made, although the physical dimensions of the property assessed as 'firmness' are variable. (No satisfactory theory of psychological dimensions has yet been proposed though these certainly differ from physical dimensions.) A study of this phenomenon is being published elsewhere, and in the course of the work it was found that even in the extreme case of truly fluid bitumen cylinders and approximately elastic rubber cylinders of the same