

Electrical Resistance of Gel-forming Mixtures during Setting.

HURD AND SWANKER in a letter to the Editor (*Journ. American Chemical Society*, June, 1933), have reported that the electrical resistance of gel-forming mixtures containing solutions of sodium silicate and acetic acid of various concentrations, undergo no change during the process of setting.

Prasad and Hattiangadi (*Journ. Indian Chem. Soc.*, 6, 893, 1929) had observed that the pH (determined colorimetrically) of the alkaline gel-forming mixtures containing sodium silicate and acetic acid increases during the process of gelation. With an expectation that some consequent changes in the electrical conductivity of the gel-forming mixtures would take place during the process of gelation we undertook to measure the electrical resistance of the gel-forming mixtures containing solutions of various concentrations of sodium silicate and of acetic and citric acids in February 1932. Our results were in agreement with those now reported by Hurd and Swanker that the electrical resistance of a gel-forming mixture does not change during gelation.

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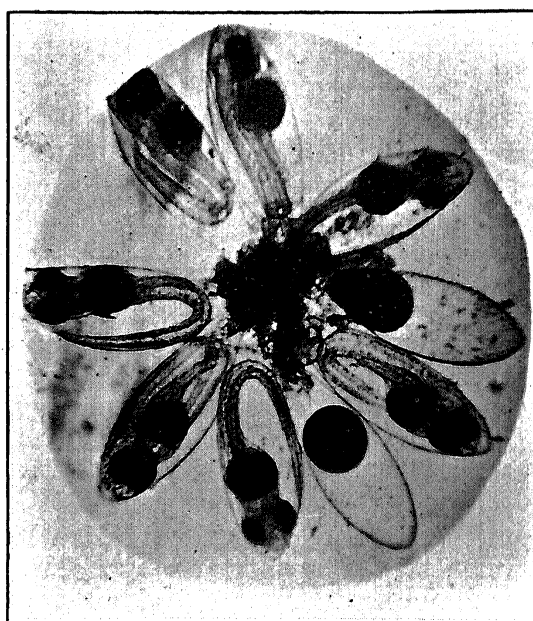
Preliminary Observations on the Life History of *Acentrogobius Neilli* (*Gobius neilli*. Day).

SPECIES of *Gobius* are essentially shore forms and many are found in brackish and fresh waters. The eggs and life-histories of several forms of this genus have been described by Guitel, Holt, Petersen and Lebour, to mention a few. Their accounts mostly deal with the nature of the eggs and the time of their occurrence. *G. minutus*, *G. microps*, *G. pictus* and *G. ruthensparrii* have had their life histories more fully worked out by Lebour and Petersen. *Gobius* usually attaches the eggs to shells of Lamellibranchs such as *Pecten*, *Ostrea*, *Mya*, *Cardium*, and often to the shell of *Patella*. The breeding months near Plymouth seem to be April, May and June. Hatching takes place in about a fortnight and a free swimming larva about 3 mm. long without pelvic fins emerges. Very little is known about the life histories of the forms occurring in India. Several stages of

G. ostreicola were described by Bhattacharya from preserved material from the Chilka Lake.

Gobius neilli occurs in large numbers in the brackish waters of Adyar and grows to 3½ inches. They begin to breed when they are 20 mm. long. Mature females can be obtained in enormous numbers just before the monsoon. A few days after commencement of the monsoon most of them are found to have spawned. Developing stages were obtained by artificial fertilisation.

Almost immediately the outer cover of the egg swells up into a club-shaped structure. The micropyle comes to be placed at the



narrow end of the club through which mucilaginous threads flow out and anchor the egg case to the substratum. The case itself is packed with a jelly like material in the centre of which the embryo undergoes its development.

Within 32 hours after fertilisation the Head, Eye Vesicles, Notochord and Brain are established.

The embryo begins to rotate in a longitudinal axis in the egg case from the middle of the second day and hatches out as a free swimming fry at the beginning of the third day of development (72 hours). The process of hatching is interesting and is executed by the embryo breaking open one side of the egg case near the free end. Further development has been followed up to the eighth day.

The time taken for hatching is very much less in this form than in those described by Lebour and can only be attributed to the

smaller size of the eggs (0.4 mm.) in *G. neilli* and also to the great difference in temperature conditions being 14°C. near Plymouth and 25°C. in Madras. Orton and others have drawn attention to the effect of temperature on the breeding of several marine animals.

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Holt, E. W. L. and Scott, S. D., "A record of the Teleostean eggs and larvæ observed at Plymouth in 1897," *Jour. Mar. Biol. Assn.*, N. S., 5, 1897-99.

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Research Notes.

Intra-cellular Inclusions in Tobacco Ring-Spot.

THE list of plants affected by viruses or ultra-microscopic organisms is quite large extending to a large number of species. Of these, only in a few cases, the diseased cells are characterised by the occurrence of intra-cellular inclusions. The latest addition to this group is the ring-spot of tobacco which has been re-examined by Woods (*Contr. Boyce Thompson Inst.*, 5, 419, 1933), who has established the presence of such bodies in plants infected under green-house conditions. These are found to occur in all cases of primary lesions in the several varieties of tobacco studied. In the case of *N. tabacum*, however, they were present where the lesions were systemic. Ring-spot disease is also observed to affect *Petunia* sp. where a similar observation has been made.

The occurrence of these inclusion bodies has been investigated with particular reference to structure, position in the cells, and distribution in the affected leaves. The bodies are always found in association with the nucleus. Non-lesioned areas did not show any such body in them. In the lesioned spots, the cells in the central portion had a greater number of bodies than those in close proximity to the necrotic areas. In these cases, the cells appear to have undergone considerable disintegration. Where the bodies were present, the cells containing them did not show visible signs of degeneration. But the development of the bodies could directly be correlated with the formation of visibly lesioned areas in the leaf.

In an affected plant, the growing point and tender shoots, although they showed partial necrosis, did not contain the bodies. As a rule, the oldest and largest cells contained them. The occurrence of these is more easily traceable to the metabolic condition of the cell at the time of inoculation, rather than to the lapse of time during which the virus remains in the cell. The bodies were generally observed to be vacuolated. Besides the vacuoles, certain other inclusions were detected within the bodies chiefly, the red staining cuboidal bodies. From the manner of their occurrence in the cell cytoplasm also, the author imagines them to be protein crystals.

The state of aggregation of substances in the diseased cells, lend the view that these vacuolated inclusion bodies represent an accumulation of certain materials in the cytoplasm. In a few instances of primary lesions the bodies were noticed to have a membrane-like periphery. The appearances and staining reactions reveal a striking resemblance to masses of young cytoplasm.

The study is important from the point of view of the origin and development of the intra-cellular inclusion bodies characteristic of virus diseases of plants. V. I.

Discovery Reports—Sponges.

IN the "Discovery Reports" (Vol. VI, pp. 239-392, plates xlvi-lvii, 1932) issued by the Discovery Committee, Colonial Office, London, Maurice Burton of the British Museum (Natural History) has given an exceedingly interesting account of the