PRO LABORATORIO

Porous Polyethylene for Adsorption Columns

During work with columns made from polyethylene, porous discs of the same material were needed. Discs made according to the following method were found to be satisfactory.

Powdered polyethylene (e.g. Telcothene Powder, The Telegraph Construction and Maintenance Co. Ltd. England) is mixed with sodium chloride in the ratio of 1 to 4 parts by weight. The mixture is packed to a depth of about ¼ inch in a mould, e.g. a small tin lid or an evaporation dish, and heated in a thermostat for 15 min at 130°C. After cooling, the specimen is removed from the mould, and washed for several hours with water in order to remove the sodium chloride. Discs are then cut out with a cork drill, and freed from traces of metal by soaking in 5*N* hydrochloric acid.

By changing the relative amounts and particle size of the ingredients, discs with different properties may be obtained.

Even in cases when polyethylene as such is not necessary, these discs may be a good substitute for sintered glass discs and plugs of glass wool generally used as support and cover for the adsorbent.

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Zusammenfassung

Scheiben von porösem Polyäthylen können als Unterlage und Decke für Adsorbentien in Säulen verwendet werden. Eine Methode zu ihrer Herstellung wird beschrieben.

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STUDIORUM PROGRESSUS

Changes in Animal Behaviour a Result of Conditioning

By J. ten Cate*

The behaviour of animals can be modified by changing the conditions under which they live. This can be attained by transferring the animals from their natural to an artificially altered environment. In this manner it is possible even to change congenital reactions to stimuli into reactions conditioned by the new circumstances.

An example can be found in the experiments which I made with *Amphioxus* (*Branchiostoma lanceolatum*). I have made observations on this fish-shaped animal, 4–6 cm in length, during repeated stays on the Mediterranean coast.

The animal lives buried in sand, from which only the cranial end protrudes. Mechanical stimulation of some part of the body of the *Amphioxus* causes the animal to withdraw immediately into the sand, in which it rapidly disappears. Under natural conditions the animals are but seldom found swimming freely in the water[1].

I have attempted to modify the innate reaction of the *Amphioxus* – evasion of stimuli by burying in sand – into a flight reaction by swimming away. For this purpose the conditions under which these animals naturally live were altered. The animals were placed in small aquarium tanks, the bottom of which was covered by only a thin layer of sand so that the animals could only partially bury themselves. If the animals are stimulated by touching them with a horse hair under these changed conditions, they first attempt to burrow into the sand, in which they fail. They then take flight and continue to swim about in the aquarium for some considerable time.

Repetition of these experiments with mechanical stimuli under constant conditions causes the animals to lose their habit of burying on stimulation within a few days; instead, they immediately swim away when touched. The animal behaviour thus has been altered by means of a change in environment.

Once the innate reaction of burying in sand when subject to tactile stimuli, was replaced by a flight reaction which constantly appeared after any stimulation, the animals were placed in an aquarium which was provided with a thick layer of sand. The flight reaction remained unaltered. If, however, an *Amphioxus* accidentally succeeded in burying itself, then the innate flight reaction by swimming was replaced again by the congenital reaction of burying, which henceforth remained predominant again.

These experiments with *Amphioxus* show that an innate instinctive reaction can be changed into a conditioned reaction by a change in the environment in which the animals live.

Another example of conditioned modification of the behaviour of animals by changing environmental conditions is found in Drzewina's experiments with hermit crabs (*Eupagurus*).

These animals are known to conceal their soft hind parts in empty snail shells, which they leave only when they grow too large for them and as soon as they have found new and larger shells. The transfer from shell to shell is effected extremely swiftly.

In her experiments with hermit crabs deprived of their shells, Drzewina placed them in an aquarium containing empty snail shells, the opening of which was hermetically closed by means of a cork.

The animals were initially restless, turning the shells over and attempting to remove the cork. After complete failure of all their attempts to enter the shells during a few days, however, they became completely indifferent and no longer touched the shells. According to Drze-

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[1] J. ten Cate, Arch. néerl. Physiol. *23*, 409 (1938).