easy to see why in the vast majority of echinoderms the process has stopped on attaining five.

In spite of many difficulties in the suture-line theory, particularly the impracticality of demonstrating experimentally its main premise, it remains attractive because it helps to account for so many otherwise strange phenomena of development. But the fact remains, as Cockbain[1] has pointed out, that any theory of echinoderm pentamerism which could be more closely linked with other unique features of the phylum, such as the single-crystalline condition and open-meshwork nature of the skeleton[6], would be highly attractive; such a theory must, however, be consistent with the facts.

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Stimulation of Hatching of the Potato-root Eelworm *Heterodera rostochiensis* by Ion Exchange Resins

WE have already reported the possibility that de-ionized water might stimulate hatching of the potato-root eelworm[1]. We now present confirmatory evidence: glass distilled water which has been in contact with certain ion exchange resins acquires marked stimulatory properties.

10 g of standard grade 'Amberlite *IRA* 400' resin was thoroughly stirred up in 100 ml. of glass distilled water and then allowed to stand for 24 h. The decanted supernatant constituted solution *A*, of unknown composition. In a hatching test of four weeks duration, using dilutions *A*, *A*/2, *A*/4, *A*/8, *A*/16, *A*/50, each tested on twenty-five cysts with a single cyst technique[2], mean larval emergence per cyst was 263, 111, 209, 250, 262 and 102, respectively. Emergence from 100 cysts in tap-water was 8 per cyst. The "resin water" was therefore very powerful; in an almost concurrent experiment with cysts from the same population, emergence in solutions of a hatching factor concentrate known to be of high activity was about 150 per cyst.

In a repeat experiment which included a series of dilutions of the hatching factor concentrate, emergence was somewhat lower in the resin water. 160 larvae per cyst emerged in the most active of the hatching concentrate solutions, and 97 in the most active resin water. An analysis of variance was carried out with a logarithmic transformation because of the skew nature of the data[3]. Values of $\log(x+1)$ were used, where x is the number of larvae to emerge per cyst. Emergence in all dilutions of resin water was significantly greater than in the water controls; the highest values did not differ significantly from the emergence in all but the two most concentrated of the hatching factor solutions.

First experiments show that a number of other resins possess the property. Clearly, de-ionized water must be used with circumspection in hatching tests. Moreover, the use of ion exchange resins, even after exhaustive pretreatment, in procedures directed towards the isolation of the hatching factor, must be attended by some risk, particularly where recovery rates are on the low side. The nature of the substance, or substances, involved is under investigation.

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Attempt to find Genetic Recombination in *Anacystis nidulans*

GENETIC relationships in the blue green algae (Cyanophyceae or Myxophyceae) are still obscure. There is some similarity between the nucleoplasmic ultrastructure of blue green algae and that of bacteria[1], and this similarity might also apply to the genetic processes of these two organisms, but there are no data for or against this idea. Kumar assumed that there was one case of a sexual or parasexual process in *Anacystis nidulans*[2]. We have carried out experiments with this organism similar to those of Kumar, and the results are discussed in this communication.

The Cambridge strain of a strictly autotrophic, mild thermophilic, unicellular blue green alga, *Anacystis nidulans* (from the Collection of Cultures of Autotrophic Organisms, Czechoslovak Academy of Sciences in Prague), was cultured in a slight modification of the liquid basal medium C of Kratz and Myers[3] at 39° C and 1,700 lux on a shaker. This strain was unable to form discrete colonies on agar–agar plates. The standard culture was first tested for sensitivity to ten different chemotherapeutic drugs (see Table 1) and then it was cultured in media supplemented with gradually increasing concentrations of the respective drugs. By this procedure we obtained strains surviving in penicillin, streptomycin and isonicotinhydrazide which were 15, 100 and 200 times more concentrated. The sensitivity to the other chemotherapeutic drugs did not change markedly during ten transfers of the standard strain in the drug supplemented media, as Table 1 shows.

Table 1. SENSITIVITY OF *Anacystis nidulans* TO CHEMOTHERAPEUTIC DRUGS

Drug	Original level of resistance (μg/ml. or IU/ml.)	Final level of resistance (μg/ml. or IU/ml.)	Mode of origin of resistance
p-Aminosalicylate	This drug has no effect even in concentrations of about 1,000 μg/ml.		
Chloramphenicol	1	3	In one step
Cycloserine	10	No increase	—
Isonicotinhydrazide	10	150	In seven steps
Neomycin	0·1	No increase	—
Penicillin	0·1	10	In five steps
Streptomycin	1	200	In seven steps
Tetracycline	1	No increase	—
Vancomycin	50	No increase	—
Viomycin	0·1	No increase	—

The increase of resistance in all three successful cases occurred in several stages; this differs substantially from the analogous processes known in bacteria[4] and could indicate a different kind of genetic control of resistance to the respective drugs in blue green algae.

The strains resistant to penicillin (PEN^r) and to streptomycin (STR^r) were used in an attempt to find genetic recombination. Both strains were tested first for stability of drug resistance by ten successive transfers through basal medium, when no decrease of resistance was observed. Also the cross-resistance to both antibiotic