of a circular rib and a bent rib. All the other cases yielded the expected results except that one rib pattern resembled the pattern in Fig. 2*b* rather than that of Fig. 2*a* though the presumptive rib had been in the middle of the rotated piece.

The control experiments in which a skin piece was cut but allowed to heal in its normal position show that the regeneration processes induced by the wound margins can have some influence on the shape and location of the rib. Some of them result in ribs with somewhat irregular deviations from the normal straight line. Fig. 4 shows the most irregular which we found. Thus, after rotation, the pattern realized can be expected to deviate from the predicted pattern to the same degree. Nevertheless, the essential correspondence between the shape of the rib and the construction of the corresponding isomixe can clearly be seen.

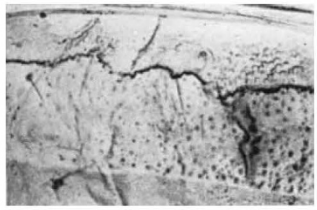

Fig. 4. Control experiment in which a piece of skin was cut but not rotated.

It can thus be concluded that a specific concentration of the gradient substance is responsible for the cell forming a rib. The concentration gradient, the existence of which is confirmed by these results, obviously has two functions: (1) to orient the scales by its direction, (2) to supply the cells by its absolute values (or ranges of concentration) with the necessary information about their distance from the segment margins and to induce the corresponding cuticular structures.

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Role of Light Energy in the Initiation and Development of Tetrasporangia on Cultured Specimens of a Red Algal Species

THE tetrasporophyte is the only known phase in the life-history of many species of red algae, and no information is available about the nature of the phase to which the tetraspores give rise on germination. Until this information is obtained, and until there are detailed descriptions of the development and characteristics of the mature carposporophyte, the classification of the Rhodophyta must remain unsatisfactory. It is therefore necessary to follow the development of the spores from their release until maturity.

The lack of information at present available reflects the difficulty of attempts to follow the course of spore germination under natural conditions on the shore. It is preferable to study the behaviour of the algae in uni-algal culture. Normally, however, investigations of this nature are hampered by the periodicity of sporulation of natural populations, and the difficulty of obtaining material in a suitable physiological condition. In order to overcome these difficulties, I have attempted to induce the production of sporangia by specimens of *Rhodochorton purpureum* (Lightf.) Rosenvinge which, at collection, had no tetrasporangia or tetrasporangial primordia.

Portions of the collected specimens were placed in culture flasks containing natural aged sea water which had been filter sterilized before use and supplemented with a medium described as *ES* medium by Provasoli[1]. The flasks were then arranged in a refrigerated cabinet at a constant temperature of 5° C in such a manner as to receive a light energy intensity in the range 1–100 ergs/sec/mm² and in the waveband 380–720 mμ. The period of illumination was 8 h in twenty-four.

The specimens exposed to light energy intensity from 1–5 ergs/sec/mm² subsequently produced sporangia of the type typical of the species. A cytological examination of these sporangia revealed that meiotic division occurs during the formation of the tetraspores so that they, like the spores of *Rhodochorton floridulum*[2], are haploid in relation to the tetrasporophyte. The haploid number of chromosomes is approximately ten. In cultures receiving light energy intensity in the region of 40 ergs/sec/mm², sporangia were not produced, and if fruiting specimens were transferred from areas receiving energies of 1–5 ergs/sec/mm² and exposed to higher energies, degeneration of the sporangia and spores followed rapidly. On the other hand, vegetative growth (cells/filament/day) was much more vigorous at higher than at lower intensities, although there was evidence of light saturation at energy intensities greater than 50 ergs/sec/mm²; in cultures receiving 100 ergs/sec/mm² there was considerable apical damage and yellowing of the chromatophores.

These preliminary results suggest that very low light energy intensities, amounting to only a fraction of those on the shore, are sufficient for the initiation and development of the tetrasporangia of *R. purpureum*, but that comparatively high light energy intensities are required for vigorous vegetative growth. It is not yet clear to what extent the specimens are conditioned, and the subsequent behaviour of the cultures influenced, by their previous biological history. More detailed experiments are in progress to elucidate this and other problems and to determine with greater accuracy the absolute limits of energy intensity above and below which sporulation will not occur.

These results are of interest not only because this appears to be the first successful attempt to induce sporangial formation in a cultured red algae, but also because sporulation was induced during the summer when sporangia are scarce or totally absent in natural populations.

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Arbovirus Antibodies in Avian Sera

SEVERAL arboviruses are known to infect wild and domestic birds and the possibility that migratory birds may act as disseminators of arboviruses has been investigated in America and Asia[1,2]. During the spring of 1965, samples of blood were collected by members of the West Sahara Ornithological Expedition from birds netted at the Defilia Oasis, near Figuig, Morocco. They were transported to London in wet ice and examined for neutralizing antibodies against African arboviruses by plaque inhibition (bead) tests performed in monolayer cultures of chick embryo cells[3]. The results of these tests are given in Table 1. Ninety-one sera were tested against Sindbis and Chikungunya virus; decreasing numbers, due to the extinction of some samples, were tested against Bunyamwera, Middelburg and O'nyong-nyong viruses. Sera from four swallows *Hirundo rustica* were positive when tested against Sindbis virus, and seven sera, from five swallows and two sparrows, *Passer hispaniolensis* and *P. domes-*