contends that the individual cells are the basic units of organization and govern the varied activities of the organism as a whole. On the other hand, the results reported here provide evidence for the organismal theory. This theory maintains that the entire organism is the primary organizational unit and controls the activities of its constituent cells. The viewpoint of this theory with respect to differentiation has been stated succinctly by Sharp[5]: "Cellular structure is accessory, and cell division is an incident of growth rather than the cause of differentiation." The present work supports the view that the formation and developmental pattern of even highly individualistic cells, such as the idioblastic sclereids of *Camellia japonica*, are under the control of a higher unit than the cells themselves.

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Deoxyribonucleic Acid in Eggs of the Polypodiaceous Ferns

It has previously been reported that in several Polypodiaceous ferns the chromatin of the egg stains progressively less intensely with the Feulgen reagent as the egg matures[1]. In the mature fixed egg a clear area is visible in the centre in a position corresponding with that earlier occupied by the nucleus; but it is impossible to identify any staining with certainty or any sharp boundary to the clear area. The condition of the deoxyribonucleic acid in these eggs raises a problem of considerable genetical and cytochemical interest. A similar condition has been reported in the eggs of some angiosperms[2] and animals[3].

Archegoniate gametophytes of *Pteridium aquilinum* were placed on slopes of Moore's medium, solidified with 1·5 per cent Difco agar and supplemented with 2·4 μc./ml. tritiated thymidine. Two days later they were transferred to unsupplemented slopes and four days later fixed in formol-proprionic-alcohol. Controls showed that in the four days after feeding with thymidine at least one transverse rank of new archegonia had originated and matured. The gametophytes were embedded, sectioned at 5 μ and covered with stripping film. The resulting autoradiographs showed that in the somatic areas surrounding the egg cells in the anterior-most portion of the gametophyte the silver grains were in register with the nuclei, and almost entirely absent from above the cytoplasm. Above the egg the grains were scattered irregularly over its whole section and it has not been possible to detect any correlation between the structures visible in the egg with the phase-contrast microscope and the arrangement of the grains (Fig. 1). When the numbers of grains in a series of adjacent sections were summed, there was no evidence that the total radioactivity incorporated into the egg was any less than that incorporated into neighbouring somatic nuclei, but it was clearly more dispersed.

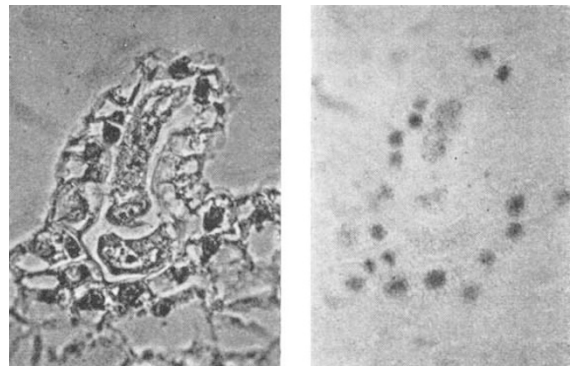

Fig. 1. Left, *Pteridium aquilinum* l.s. mature archegonium showing egg, and the disintegrating ventral and canal nuclei; right, autoradiograph of the same section showing the radioactivity confined to the somatic nuclei, but dispersed throughout the egg (× *c.* 320)

It is generally agreed that thymidine is incorporated specifically into deoxyribonucleic acid. The results of these experiments show that in the mature egg of *Pteridium* the deoxyribonucleic acid is distributed throughout the whole cell. There is, in fact, no recognizable nucleus. A more detailed investigation of the behaviour of the deoxyribonucleic acid during oogenesis and fertilization in *Pteridium* is at present being completed.

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MICROBIOLOGY

Nuclear Structure of Growing Naked Protoplasts of Yeasts

Although many suggestions have been made, the actual nuclear structure of yeast cells is still not known. Contradictions are due to the use of various methods and by different interpretations of artefacts. Only recently have yeast nuclei been studied *in vivo* by phase contrast[1]. Our experiments have shown that the naked protoplasts of yeast and especially the growing protoplats (the so-called plasmatic formations) are, under certain conditions, suitable for the study of the nucleus *in vivo*. The present report covers the results of this research.

Naked protoplasts of *Saccharomyces cerevisiae* were obtained by a method already described[2]. Due to capillary forces a considerable flattening of the protoplasts and plasmatic formations takes place, with the result that the inner structure is easily observable by phase contrast. At the same time a flattening of the nuclei occurs so that division is easily observed. The vitality of the protoplasts is not disturbed as is shown by their growth and regeneration[3].

Under a phase microscope the nucleus appears as a body with a lower refractive index than the cytoplasm (it appears lighter). The shape is usually oval but is often irregular. Sometimes the nuclear membrane is clearly visible. The 'nuclear vacuole' has never been observed. As a rule the nucleus contains a body having a higher refractive index (Figs. 1 and 2). Inside