sity of Reading, for suggestions concerning technique.

J. F. Rigby

Broken Hill Proprietary Co., Ltd.,
Central Research Laboratories,
Shortland, 2N,
New South Wales.

[1] Plumstead, Edna P., *Trans. Geol. Soc. S. Afr.*, **55**, 281 (1952). Lacey, W. S., *Nature*, **184**, 1592 (1959).
[2] Plumstead, Edna P., *Palæontographica*, 100 (B), (1956).
[3] Plumstead, Edna P., *Trans. Geol. Soc. S. Afr.*, **61**, 51 (1958).
[4] Sen, J., *Bot. Notiser*, **108**, 244 (1955).
[5] Srivastava, P. N., *Palæobotanist*, **3**, pl. 3, Figs. 22–25 (1954). (This author described his specimen as "A cone probably belonging to *Schizoneura gondwanensis*".)
[6] Plumstead, Edna P., *Trans. Geol. Soc. S. Afr.*, **59**, 211 (1956).
[7] Rigby, J. F., *Austral. J. Sci.*, **23**, 230 (1961).
[8] White, D., in White, I. C., *Comissao estudos das Minas de Carvao de Pedra do Brazil* (Rio de Janeiro, 1908).
[9] Feistmantel, O., *Flor. Gondw. Syst.*, **3**, Supp., 49 (1881). Lundqvist, G., *K. svensk. VetenskAkad. Handl.*, **60** (3), 1 (1919). Surange, K. R., and Lele, K. M., *Palæobotanist*, **5**, 82 (1956).
[10] White, D., *loc. cit.*, pl. 8, Fig. 10.
[11] Arber, E. A. N., *Quart. J. Geol. Soc. Lond.*, **61**, 324 (1905).
[12] Melville, R., *Nature*, **188**, 14 (1960).

A Membrane Peculiar to the Egg in the Gametophyte of *Pteridium aquilinum*

Investigations of the ultrastructure of the cells taking part in oogenesis in *Pteridium aquilinum* have shown that the mature egg possesses a membrane lying between the plasmalemma and the cellulose wall, and not present in adjacent cells (Fig. 1). After fixation in potassium permanganate and staining with uranyl acetate this additional membrane is electron dense, and it probably therefore consists of lipid or lipo-protein. The membrane is absent from the young egg and the cells preceding it, and there is evidence, which will be presented in detail elsewhere, that the material of which it is composed is derived from organelles which have degenerated during the maturation of the egg.

Although this membrane cannot be seen in sectioned material with the light microscope, DeMaggio[1] recently reports that the egg of *Todea barbara*, which unlike the egg of *Pteridium* can be viewed as a solid object lying in the venter of the archegonium, is enclosed in a thin transparent membrane. It seems likely that this membrane is similar in nature to that now detected in *Pteridium*, and such a membrane

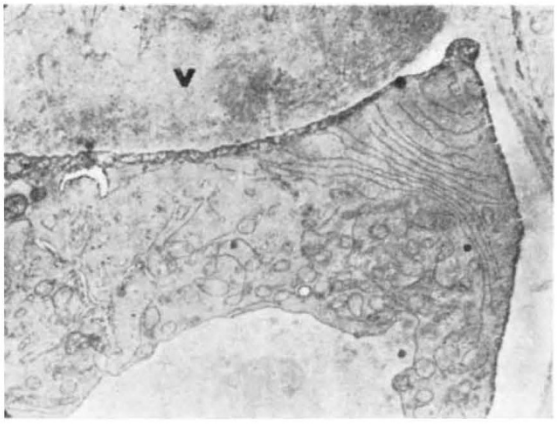

Fig. 1. *Pteridium aquilinum*. Section of mature egg stained with uranyl acetate. A densely staining membrane surrounds the egg. The egg is surmounted by the degenerating ventral canal cell (*v*). (× *c.* 5,630)

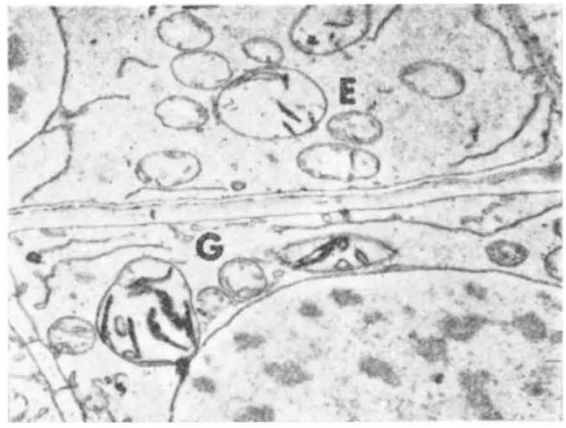

Fig. 2. *Pteridium aquilinum*. Section of portion of embryo about 15 days old and adjoining gametophyte, stained with uranyl acetate. Patches of the membrane formerly surrounding the egg can be seen lying between the plasmalemma of the embryo cell (*E*) and the cellulose wall forming the boundary between the embryo and the gametophyte (*G*). (× *c.* 10,670)

may be general in the egg cells of ferns, and possibly of other plants.

Sections of embryos of *Pteridium* show that this extra membrane persists during their early development as a layer on the inside of the outer walls of the peripheral cells. As the embryo expands and these cells divide the layer becomes attenuated and eventually discontinuous (Fig. 2).

A layer of this kind would be expected to influence the permeability of the boundary of the egg and young embryo. The failure of nucleotides to diffuse freely into the embryos of *Pteridium*, reported by Bell[2], is probably explained by its presence. Conversely the layer might also reduce the tendency of metabolites to diffuse out of the zygote and young embryo. This may explain the fact that according to DeMaggio and Wetmore[3] the isolated zygote of *Todea barbara* undergoes normal development in liquid culture up to the octant stage, but not afterwards. The irregular development which then ensures could be partly a consequence of the attenuation of the lipid layer in the outer cells of the embryo and a rapid loss by diffusion into the medium of metabolites essential for ordered growth.

P. R. Bell

Department of Botany,
University College,
London, W.C.1.

K. Mühlethaler

Laboratorium für Elektronenmikroskopie,
Institut für Allgemeine Botanik,
Technische Hochschule,
Zürich, 6.

[1] DeMaggio, A. E., *Phytomorphology*, **11**, 64 (1961).
[2] Bell, P. R., *Nature*, **191**, 91 (1961).
[3] DeMaggio, A. E., and Wetmore, R. H., *Amer. J. Bot.*, **48**, 551 (1961).

Source of Dichromatism in Two Maldanid Polychætes

The tubiculous Maldanid polychætes are among the most abundant infaunal components of intertidal and sub-tidal bottom communities of the North American Atlantic coast. Within their respective ranges the two species *Clymenella torquata* Leidy and *Axiothella mucosa* Andrews show a striking dichromatism: populations may be either green or orange.