(3) A perispore which is composed of a thin membrane staining red with PAS reaction, and several spherical bodies that show light blue in the Giemsa staining like the exospore. The following species have perispore of this type: *P. lingua, P. mollis, P. linearifolia, P. mannii, P. eberhardtii, P. tricuspis* and *Saxiglossum angustissinum.*

From the recent detailed studies, it has become clear that several genera of Polypodiaceae have a perispore around the exospore. The well-developed perispore found in the genus *Pyrrosia*, however, has never been found in any other genera of this family.

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B. SPORE GERMINATION AND GAMETOPHYTE DEVELOPMENT

Photocontrol of protonema growth in *Polypodium vulgare* L.

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When imbibed spores of *P. vulgare* L. were given a short exposure to red light, germination was complete by day 7 and then protonema growth continued until day 12. If a second short exposure of red light was given on day 7, protonema growth was enhanced and continued indefinitely if further exposures of red light were given at weekly intervals. If the red light was replaced by blue, similar effects were obtained but if it was replaced or followed by far-red light, protonema growth stopped. This red/far-red light response was repeatedly reversible and thus implicates phytochrome. The response entailed increase in cell division and length but not in cell width. The action spectra for cell division and elongation are essentially identical to those for spore germination and for other known low energy phytochrome responses.

When the exposure given on day 7 was prolonged for 24 h or more, two distinct high energy responses were recognisable. With blue light, cell number increased, cell length decreased and cell width increased; with far-red light, cell number and length increased but cell width decreased. Quantitatively, the effects of red light were intermediate between those of blue and far-red light. The simplest interpretation is that the blue light response is mediated by the uncharacterised blue light absorbing pigment, the far-red response is controlled by the high energy phytochrome reaction, while the response to red light involves both pigment systems.