LYCOPODIUM **trachyloma** (Herter) Maxon, *in sched., comb. nov.*
Urostachys trachyloma Herter, *op. cit.* 113.
LYCOPODIUM **ulixis** (Herter) Morton, *comb. nov.*
Urostachys ulixis Herter, *op. cit.* 115.

Herter's reasonably good work was not duplicated by that of his student Hermann Nessel, whose book "Die Bärlappgewachse" added little to our knowledge of the group. However, some of the species described by Nessel are good, and one of them is rather common in the Andes of Colombia:

LYCOPODIUM **wohlberedtii** (Nessel) Morton, *comb. nov.*
Urostachys wohlberedtii Nessel, Repert. Sp. Nov. Fedde **39**: 69. 1935.

SMITHSONIAN INSTITUTION, WASHINGTON, D. C.

Some Hints for the Fern Culturist[1]

IRVING W. KNOBLOCH

The culturing of ferns in all of its phases is of intense interest to many of our members. One of the most challenging aspects of this hobby is raising ferns from spores and bringing the sporelings to maturity. A few of the more important articles on this subject are those by Hires (1940), Benedict (1955) Kleinschmidt (1952, 1957), Boydston (1958). Fliflet (1961) summarizes much of the former material on growing ferns from spores, and there is very little new that can be added.

Fern enthusiasts might, however, be interested in a new substrate for spore culture. The name of this material is *Turface*. It is a ground, calcined, clay product designed as a soil amendment to loosen soil, stimulate root growth and for similar gardening uses. It is manufactured by the Wyandotte Chemical Corporation, J. B. Ford Division, Wyandotte, Michigan. Currently it is sold in 50-pound bags but it is my understanding that it is soon to come out in smaller quantities and sold through chain stores. Spores can be sown on any reasonable substrate, of

[1]Contribution No. 63-1 from the Department of Botany and Plant Pathology, Michigan State University. Photograph by Phillip Coleman.

course. For example, one can hardly surpass oak soil (Kleinschmidt, pers. comm.) for many ferns. The very rough nature of a bed of *Turface,* however, seems to provide varying microeco-

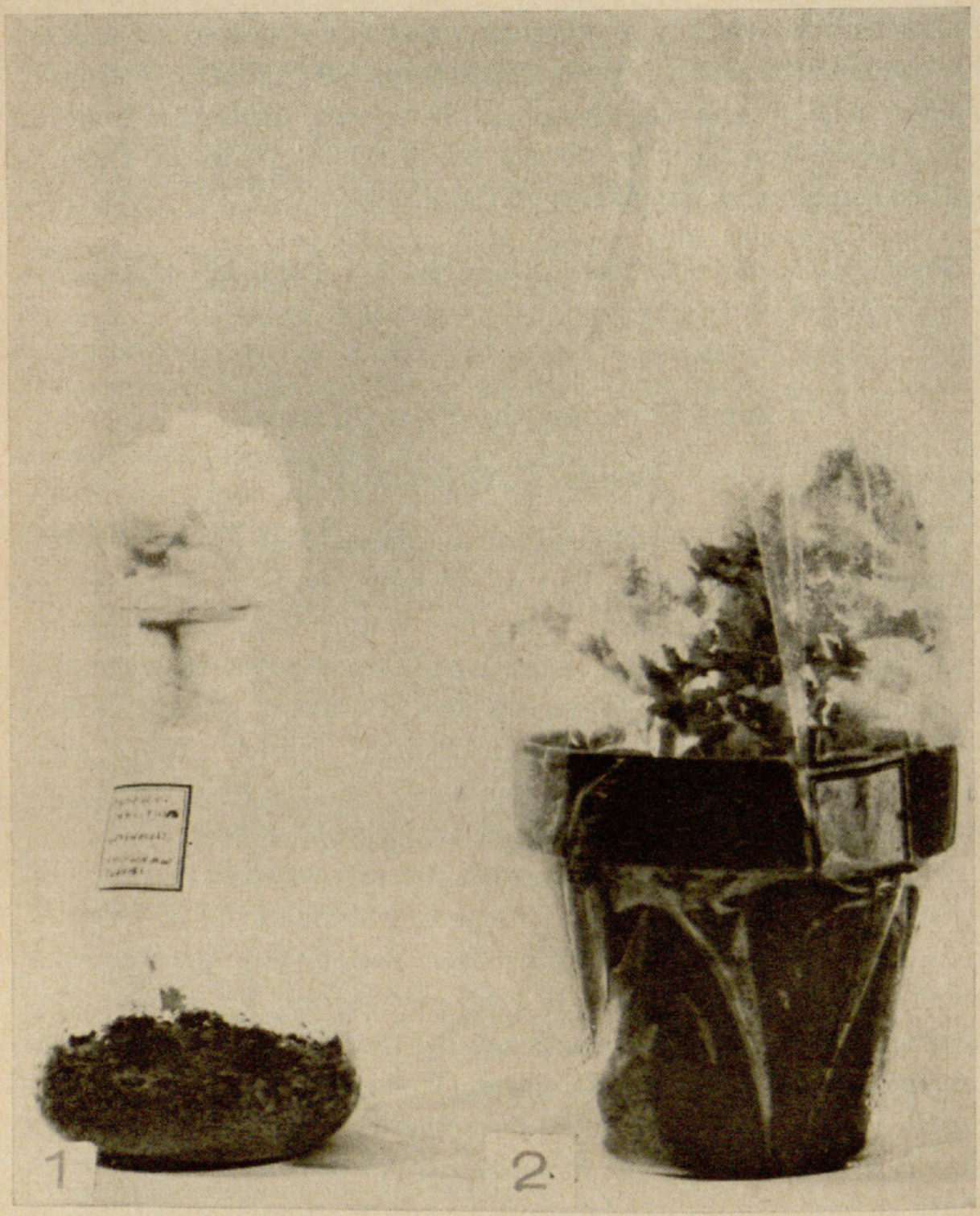

FIGURE 1. CULTURE OF PROTHALLIA AND YOUNG SPOROPHYTES IN FLASK.
FIGURE 2. YOUNG SPOROPHYTES IN POT COVERED WITH PLASTIC FREEZER BAG.

logical niches for spores and we have had very good luck with the material so far. As seen in figure 1, we have been placing the *Turface* in small flasks. We soak the medium in a modified Knutson's nutrient medium (almost any other will do), and then sterilize the flask in an autoclave for about 30 minutes. The spores are then sown through the mouth of the flask. One should have spores of known origin (uncontaminated) to begin with and Kleinschmidt's method (1957) of sterilizing the fronds before all of the spores have been shed is an excellent one. This precaution will largely prevent contamination by unwanted fern spores and also reduce fungal contamination. The sexual phase or gametophytes will develop from the spores if conditions are right. Usually one is only desirous of obtaining the sporophytes and one small trick here usually or frequently overlooked is to water the mass of prothallia from above (distilled water will do) so as to ensure fertilization and the development of the sporophyte. It should be mentioned in this connection that growing ferns in a closed flask largely eliminates as much watering as found in the potted soil method. One can tell when the clay needs watering by noting its color, which changes with varying percentages of water.

When the sporophytes are about an inch high, they are ready for transplanting. They can be spaced in pots or flats after removal (by shaking or by long forceps) from the flasks. This stage has always proven to be a hazardous one and many sporelings die. A way to ensure success with the transplanting and to force the plants along, is to place the pots of transplants (in moist soil) in a plastic freezer bag, label, using a wooden label, and close the top of the bag with a rubber band (fig. 2). The humid atmosphere in the bag offsets transplant loss and, each bag, acting as a miniature greenhouse, causes the plants to grow much faster than they ordinarily would.

LITERATURE CITED

BENEDICT, R. C. 1955. Aids to Spore Culture. Amer. Fern Jour. **45**: 60-64.

BOYDSTON, KATHRYN 1958. An Amateur Plants Fern Spores. Amer. Fern Jour. **48**: 1-18.

FLIFLET, THORLEIF 1961. Growing Ferns from Spores. Amer. Fern Jour. **51**: 113-127.

HIRES, CLARA S. 1940. Growing Ferns from Spores on Sterile Nutrient Media. Jour. N. Y. Bot. Gard. **41**: 257-266.

KLEINSCHMIDT, W. F. 1952. Growing Ferns from Spores. Amer. Fern Jour. **42**: 117-124.

———— 1957. A Method of Preparing Spores for Fern Cultures. Amer. Fern Jour. **47**: 95-98.

MICHIGAN STATE UNIVERSITY, EAST LANSING, MICHIGAN.

Ethnobotanical Uses of California Pteridophytes by Western American Indians

ROBERT M. LLOYD

Utilization of pteridophytes by Western American aborigines played a minor but very interesting role in their lives. Most of the pertinent information is scattered. This paper attempts to summarize much of this information.

The species known to have been used by the western North American Indians north of Mexico are discussed below. The botanical nomenclature is according to Munz (1959).

LYCOPODIUM CLAVATUM L. Club-moss. Although there is no evidence for use of this species by western Indians, Frye (1934) reported its spores were collected for dusting on open raw wounds and chafed infants. The spores are very fine and light, which enables them to repel water and prevent stickiness. *Lycopodium selago* L., a related species in the northwest was used by Indians as an intoxicant. The stem was chewed and the juice swallowed. It is said that three plants produced a mild intoxication whereas eight plants stupified the user.

EQUISETUM ARVENSE L. Common horsetail. The major use of the horsetails was as an abrasive in polishing bows and arrows (Murphey, 1959). However, it was sometimes dried and burned and the ashes used on sore mouths. The Lower Chinook Indians