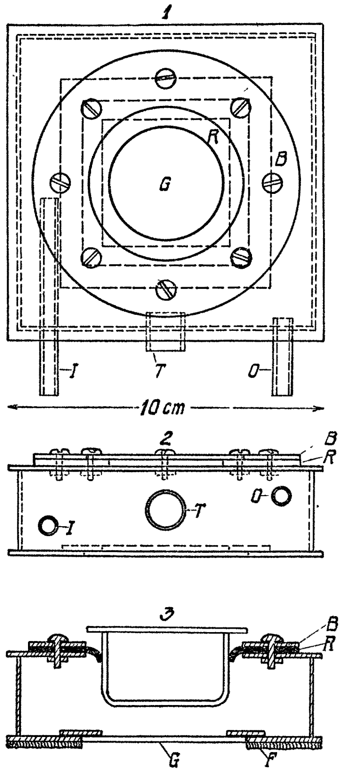

FIG. 1. Apparatus for maintaining a constant temperature during microscopical observation of living materials. B, brass washer; R, rubber diaphragm serving to grip the glass dish and prevent leakage of water; G, glass inset through which transmitted light is received; I, O, inlet and outlet tubes through which a stream of water of constant temperature is passed; T, tube to receive a small thermometer inserted in a rubber stopper; F, felt pad cemented to the bottom of the apparatus to prevent marring of the microscope stage and breakage of the glass inset; 1, top view of the apparatus; 2, end view; 3, diagrammatic section through the center with the glass dish and cover in place.

one hole rubber stopper inserted in the side of the apparatus and extending up to the edge of the dish serves to indicate the temperature. A thin layer of felt cemented to the bottom of the apparatus prevents marring of the microscope stage and minimizes the danger of breaking the glass inset.

In the constant temperature apparatuses constructed for the course in general physiology, a circular coil of copper tubing has been inserted inside, so that the stream of water circulates through the coil instead of through the main chamber of the apparatus. A static volume of water is thus kept in the apparatus. The addition of the coil minimizes the tendency for the inlet and outlet sides of the dish to assume slightly different temperatures.

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PEAT MATS FOR GERMINATION TESTS OF FOREST TREE SEEDS

A FORM of peat variously known as "peat moss," "acid peat" and "florists' peat" gives promise as a medium for testing the germination of seeds of various forest trees. At the Southern Forest Experiment Station of the U. S. Department of Agriculture, the peat has been compressed into mats or blocks with grooves on the upper surface to receive the seeds, and these mats have proved a valuable supplement to, and a possible substitute for, the cumbersome sand flats ordinarily used for germination tests of the seeds of southern pines. In the tests so far made, the peat mats have given more prompt results than the sand flats and, usually, higher final germination. Fig. 1

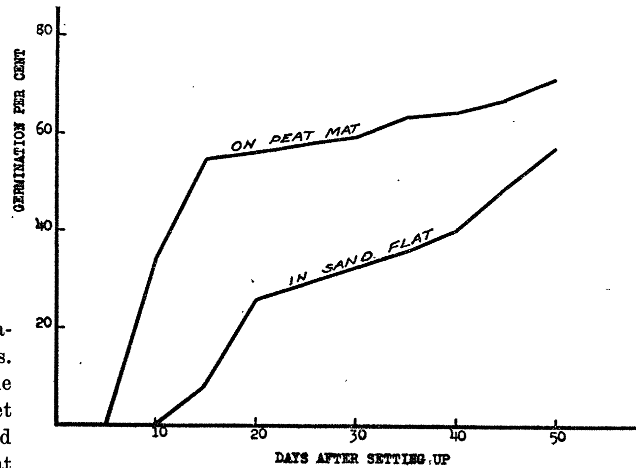

FIG. 1

shows the course of germination of comparable samples of seed of *Pinus caribaea* on peat and in sand.

The mats occupy only one fifth or one sixth of the laboratory space required by sand flats, and their use does not involve introducing grit or sand among laboratory apparatus. In two parallel series of nine tests each, run for fifty days, the actual manipulative time of the series on peat mats, including final cutting tests, was only 85 per cent. of that required for the series in sand flats. Like sand flats, the peat mats are adapted to the testing of large seeds, for which Jacobsen germinators are not suitable. Adequate moisture is more readily maintained in the mats than in the sand flats. Seeds set to germinate on peat are less subject to mold than those set up on paper or cloth substrata.

The germination of many kinds of seeds is hastened and improved by stratifying the seeds in moist peat, at low temperatures, for a month or two before testing.[1] If the test is to be made in a sand flat, much

[1] Lela V. Barton, "Hastening the Germination of Southern Pine Seeds," *Jour. Forest.*, 26 (6), 774–785. 5 fig. 1928.

time is consumed in picking the moist seeds out of the peat used in stratification, recounting them and sowing them in the flat. Use of the peat mat saves this time, since the mat is a suitable medium for stratification as well as for germination. The seeds are counted while still dry and easily handled, set up on the mat in position for the germination test, refrigerated for the desired period and removed to the germination room without further manipulation.

The peat mat used by the station is 19 by 19 cm square by 2 cm thick, and fits loosely into a square glass baking dish which is covered by a pane of ordinary window glass during the test. The mat is molded on a form consisting of ten triangular wooden strips, 17.7 cm long, 6 mm wide at the base and 4 mm from base to apex, tacked on a board parallel to each other and 1.6 cm apart from apex to apex. A square frame or collar of galvanized screen wire, 2 cm deep and 19 cm on a side, is held in position around the block of strips by four headless nails driven vertically into the board. Around this wire frame a snugly fitting square wooden frame is slipped to keep the wire from bulging. Moistened peat is packed into the frame and down upon the triangular strips, and is compressed with the hands into a firm mat 2 cm deep. The apparatus is inverted, the board with the strips is gently lifted off, and the completed peat mat and its wire border are carefully pushed out of the square frame into the glass dish. The triangular strips leave what is now the upper surface of the mat marked with ten equally-spaced grooves or drills, each suitable for 25 to 50 seeds, depending on size.

By keeping a trace of free water in the bottom of the dish at all times, it is possible to maintain nearly ideal moisture conditions at the top of the mat throughout the tests.

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SPECIAL ARTICLES

APPARENT PARTHENOGENESIS IN NATURE, IN A FORM OF FISH OF HYBRID ORIGIN

WE are now clinching with experimental proof a number of ideas developed out of a study in systematic ichthyology. As these ideas express phenomena which are new for the vertebrates, this preliminary announcement is being published.

Through northeastern Mexico and the southern tip of Texas there occurs in abundance a form of viviparous cyprinodont, of the family Poeciliidae, which has been thought to be a distinct species, *Mollienisia formosa*. From circumstantial evidence we concluded that this form was probably the hybrid between *Mollienisia latipinna* and *Mollienisia sphenops*, species so distinct that they were long placed in different genera. This form was found to be exactly intermediate between those species in all distinctive features—depth of body, strength of rows of spots, position and size of dorsal fin and number of dorsal fin rays. These characters are all closely correlated and may be briefly illustrated by the usual number of dorsal rays: 9 in *sphenops*, 11 in *"formosa"* and 13 in the local race of *latipinna*.

Mollienisia "formosa" varies somewhat geographically, but in each region it is intermediate between the particular local forms of *sphenops* and *latipinna* which occur there. Recently we have received an apparent hybrid from the Yucatan Peninsula, exactly intermediate between the local race of *M. sphenops* and *M. velifera*. The dorsal rays are 13, midway between the approximate average for the local *sphenops* (9.5) and for *velifera* (17.5).

In the laboratory, a culture of males and females of this supposed hybrid stock, obtained by Dr. Myron Gordon in Rio Papaloapan, Vera Cruz, Mexico, has shown various reproductive abnormalities. Although several of the females apparently have become pregnant, only one of them in our aquaria has delivered young, two in one brood and one in the next brood (a female *Mollienisia* of this size should produce 10 to 60 young in a brood). No such lack of fecundity is apparent in the initial cross producing the hybrids, nor in the back crosses with the parent species. Most of the apparently pregnant females reverted to a thin condition, as though resorbing young. A rather high percentage of the young are abnormal, and most or all of the abnormal ones are developing into males. An unusually high percentage of the adult males develop irregular black blotches.

The hypothesis that *Mollienisia "formosa"* is the hybrid of *M. latipinna* by *M. sphenops* has just been verified by an aquarium mating of a male *sphenops* and a virgin female *latipinna*. The 22 young produced are clearly hybrids. We also have apparently pregnant females from the reciprocal species-cross.

This verified hybrid exists in nature in great abundance. Many hundreds of specimens have been collected. It has almost every characteristic of a species: a definite, homogeneous range; clear consistency of characters, and, as shown below, the ability to repro-