QUOTATIONS

CONGRESS AND RESEARCH

"INSATIABLE curiosity . . . scientific research . . . wealth of new inventions and new products so satisfying to material needs of the people . . . certainty of endless and ever more rapid change as new knowledge is translated into new conveniences and comforts . . . the Government still does, and increasingly should, lead the way toward the discovery of new knowledge." These phrases with which President Hoover introduces in the January *Scientific Monthly* a series of articles on government research have a familiar ring. They will bear repetition in the hearing of a Congress that seems too bent on reducing expenditures at the expense of science.

In 1921 many commercial organizations stopped or curtailed research, only to rue their decision when, a few years later, new staffs had to be organized. In this far severer depression retrenchment has been felt less in the industrial laboratory than in the factory and salesroom. There may be less pioneering, but there are few signs that investigations which were begun in happier times have been abandoned. Yet the House is eliminating $46,470 from fundamental research in geologic science and $60,180 for the investigation of mineral resources in Alaska, to mention but two items. On this fundamental research the development of our mines and oil fields is directly dependent. How often must the story of new industries based on the utilization of waste be told or the riches that lie in a new principle?

There is no scientific lobby to drive home the implications of the President's language, particularly when he refers to government leadership in discovering new knowledge. The protests of the American Chemical Society, the mining industry, universities that have cooperated with government laboratories and a few isolated manufacturers have availed little. Government science must stand or fall on its own merits: It must, of course, economize with the rest. But one looks at the $450,000,000 which, according to the National Economy League, could annually be saved if our war-pension policy were corrected, and sighs for Utopia. How trifling in comparison seem the few millions needed to carry on wealth-producing scientific work!—*The New York Times.*

SCIENTIFIC APPARATUS AND LABORATORY METHODS

CONSTANT TEMPERATURE APPARATUS ADAPTED FOR USE ON THE MICROSCOPE STAGE

THE apparatus described in the text and in Fig. 1 was used in maintaining constant temperature during microscopical observation on the rate of locomotion in Amoeba in various salt solutions. It has proven its practical worth to such an extent that several have been made for use in the course in general physiology in The Johns Hopkins University. The apparatus consists essentially of a brass jacket, through which a stream of water is circulated, the water bathing the bottom and the sides of a pyrex glass dish and maintaining the temperature of its contents constant. It is placed on the stage of the microscope, and transmitted light for observation is received through a glass window in the bottom.

It has the following advantages over the conventional Pfeiffer warming stage: it is not easily broken, the temperature of the solution in the dish is not appreciably influenced by rapid changes in room temperature, the dishes can be sealed to prevent exposure to air, and a series of dishes containing different solutions can be prepared and rapidly inserted into and removed from the apparatus.

With 5 cc of solution in the dish and with the glass cover in place, observation of material in the dish can be made under a compound microscope with a 32 or 40 mm objective. With the cover removed, a 16 mm objective or a water immersion lens of any desired focal length can be used.

The apparatus is constructed of half hard brass, the top and bottom (10 cm square) of 1/16 in. stock, and the sides (1 in. high) of 3/64 in. strip brass. The joints are soldered and the glass inset in the bottom, through which light for microscopical observation is received, is sealed in with DeKhotinsky cement. The rubber diaphragm which grips the glass dish and prevents leakage of water is made from automobile tire inner tubing, the diameter of the hole in the center being slightly less than the diameter of the dish it receives. The dishes are made by cutting off the bottoms of 50 cc Pyrex beakers with a hot wire and grinding down the edges with emery powder. The temperature is maintained at any desired constant value by varying the rate of flow of hot or cold water through the apparatus. A small thermometer in a

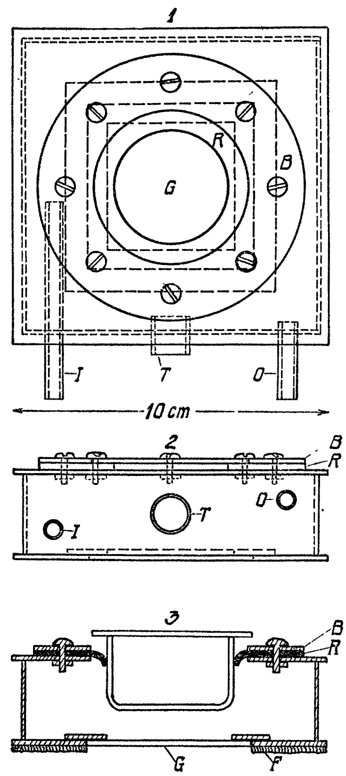

FIG. 1. Apparatus for maintaining a constant temperature during microscopical observation of living materials. B, brass washer; R, rubber diaphragm serving to grip the glass dish and prevent leakage of water; G, glass inset through which transmitted light is received; I, O, inlet and outlet tubes through 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

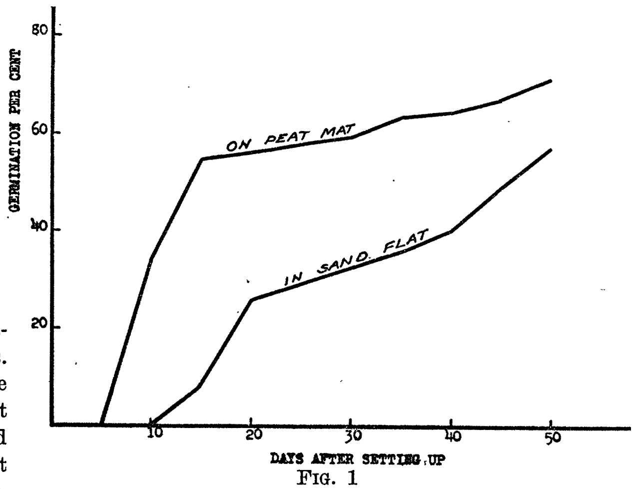

FIG. 1

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.