

pressure toward compliance to the end that the grants might be continued.

A peril of a different kind comes from the tacit assumption that graduate students might do much of the routine work on research projects supported by the Government. I submit that scientific research projects set by outsiders, either by the Federal Government or by industry, have no proper place in a university. Routine work is not the function of a university or of its graduate students, but a contract for research must necessarily involve large amounts of purely routine work and will tend to make the university scientific staff merely the supervisors of the execution of tasks set by others than themselves, thus consuming their energies without developing their own initiative and ingenuity.

Another danger is that some of the work which the Government might wish to allot to the universities may be of a secret nature. Secret research is contrary to the whole idea of the free pursuit of and sharing of knowledge that university research is supposed to promote. If a branch of the Government desires that research be done, it should set up its own organization and hire its own men. The research jobs would be done, the universities would remain free, and their students would not be subjected to the vicious influence of secrecy in the search for knowledge.

As to the argument that the universities are in financial straits and that, therefore, government help is necessary, it would seem that scientists interested in the promotion of research, but at the same time desirous that science and the universities should remain free, would be better engaged in seeking an amendment to the income tax laws such as that proposed by King (*Science*, June 6, 1947, pp. 593-594) than in promoting the establishment of a National Science Foundation.

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A Promising Type of Male Sterility for Use in Hybrid Tomato Seed Production

While searching for male-sterile tomato plants in 1945, the writer found an interesting type of "sterility" in the variety John Baer. This mutant can be selfed by hand-pollination, but it does not self in the field; as is normally the case. It therefore can be maintained easily as a pure line through hand-pollination and can be used as a female parent in hybrid seed production without the need for emasculation. About 75% of the labor involved in hybridizing is eliminated. Natural selfing is prevented because the anthers fail to dehisce. The character appears to behave as a simple recessive. When incorporated into other desirable parental lines, it will materially reduce the cost of hybrid seed production.

Work on the "quantity collection" of pollen by means of electric-battery vibrators has been done by a large seed company, and experiments with inert diluents have been conducted intermittently during the last four years.

Thus, improvements in pollen collection and application, combined with the development of suitable "male

steriles," give promise of greatly expanding the use of hybrid tomatoes.

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A Comparative Study of Zygote Germination in the Saprolegniaceae

In spite of the fact that the members of the Saprolegniaceae have been studied for over a century, the germination of the resting bodies has been reported in only a few species of the family. In order to complete the life histories of these forms, 26 species belonging to 10 genera were collected and identified. Without exception, the zygotes of all species were successfully germinated when the mycelium of each form, after a rest period, was placed in fresh distilled water which had been treated with activated charcoal, filtered, and autoclaved (A. W. Ziegler. *J. Elisha Mitchell Sci. Soc.*, 1948, 64, No. 1, in press).

The germinated zygotes fall into four types:

(A) Those in which a long or short germ tube is formed with an apical sporangium. The forms in this group included a species of *Aplanes*, and most species of the genera *Saprolegnia* and *Achlya*.

(B) Those in which the germ tube produces a sparsely branched mycelium with a sporangium at the apex of the main hypha or a branch. This type includes several species of *Isoachlya*, *Achlya americana*, and *Aphanomyces laevis*.

(C) Those in which the primary germ tube forms a branched mycelium. This group includes two species of *Isoachlya*, *Achlya glomerata*, *Aphanomyces laevis*, and *Brevilegnia linearis*.

(D) Those in which the primary germ tube forms a long, unbranched hypha. Forms in this classification include *Aphanomyces laevis* and species of *Geolegnia* and *Brevilegnia*.

The food material contained within the zygotes of the Saprolegniaceae is in the form of numerous small droplets, or one large drop of fatty reserve. Tests involving the use of Sudan III, Sudan IV, osmic acid, Nile blue sulfate, saponification, polarization, and solubilities seem to indicate that the reserve food material is true fat and that no fat-like substances are present.

Experiments involving the effects of pH on germination have demonstrated that low and high pH's tend to inhibit germination, while a pH of 6.9 allows the zygotes to germinate normally. An experiment, repeated several times, on the effects of light on germination has demonstrated that, at least for the species used in the experiment, light is necessary for germination.

A study of the literature of germinating resting bodies of other aquatic oömycetes reveals that they fall into several distinct patterns. However, these germination patterns have thrown no new light on the phylogeny of the Saprolegniaceae.

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