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Abstract
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The October 1, 1966, letter "To all Neurosporologists", from the editor, was clear in stating the desired emphasis of NN#10, i.e., " the use of Neurospora in teaching", but I am going to take the liberty of expanding that emphasis, via the catchall "in teaching", to two aspects of laboratory teaching not specified in the letter.

The first point is directed to teachers who may wish to use Neurospora as a laboratory teaching tool but who are at present unfamiliar with it. In my opinion it is unwise to incorporate Neurospora into the student laboratories (a) before the laboratory is properly equipped, and (b) before the teacher has become familiar with, maintained, and worked with the organism. The ill-equipped laboratory coupled with inexperienced hands insures contamination of the cultures and a teacher unfamiliar with the eccentricities of Neurospora may only add to the confusion of interpreting experimental results. If Neurospora is used under these conditions, it would be best to "mark" all the stock cultures (e.g., with albino) so that natural contaminants can be screened . My experience leads me to conclude, however, that Neurospora is not an ideal organism for the amateur who has neither the time, equipment nor inclination to become thoroughly familiar with it, and that the confusion created by contamination and unfamiliarity in beginning laboratories for offsets the slim harvest of insight or intellectual stimulation its use may afford.

The second point is directed to teachers who are familiar with Neurospora and who have teaching laboratories equipped to cope with it. These teachers may use Neurospora as a means for designing questions and problems calculated to stimulate the imagination of the student rather than as gimmicks to keep him busy. A plan that I have followed can be adapted to the personality of the teacher and it has proven a worthwhile incentive for my students. In brief, my suggestion is to present to the student the responsibility of becoming acquainted, through the literature, with specific key experiments (each teacher will make his own list), and with some of the questions being asked today by Neurosporologists. In the meantime, the student will do some simple growth kinetics, transferring, ascospore isolations, etc., to become familiar with basic procedures. Following such orientation the student will propose an experimental design, defend the design, modify it to fit all the "feasibles" (time, space, equipment, etc.), and then attempt to execute the experiment.

The isolated pockets of education which permit student participation both in the design and the execution of experiments are rare, and this extends to many graduate schools. It would appear that a well-equipped laboratory coupled with a teacher familiar with the experimental material may well combine to foil the "busy-work" approach taken, usually out of necessity, by teachers with fewer resources, and at the same time take the more positive approach of encouraging student expression .

During the first year such a laboratory was conducted at Rice, one pair of students undertook the task of recovering a radiation-resistant strain of Neurospora, hopefully to compare "repair mechanisms" with those proposed for bacteria. Through repeated irradiation and asexual transfer, they were able to isolate a strain which showed about 20% survival at a dose of ultraviolet light which killed all of the parent conidia. This mutant also showed markedly increased resistance to gamma irradiation. When crossed with wild type the resistant strain produced both sensitive and resistant progeny in a ratio of 1:1. One of the students, an organic chemist theretofore, was accepted at the University of California, San Diego for graduate work in biology: the other, a married woman, stayed at Rice where she earned the master's degree. Later, another pair of student tried to detect and isolate thymidylate synthetase in Neurospora. Their project failed, in the classical sense, but both students gained insight and momentum; one was accepted for graduate study in the biochemistry department at Stanford, and the other in chemistry at UCLA. It is difficult to plot the "human-element-data" of these "experimental" laboratories, but the correlation seems high between excitement about research and the desire to enter graduate school . The relative merits of the more stereotyped student laboratories compared with the type described here with respect to inciting interest in research cannot be proven; however, my own views should be obvious.

What really matters about laboratories designed to acquaint students with biology is whether or not the students think about the experiments and subsequently apply the ability to think to their own work. I contend that the probability of their thinking about their work increases proportionately with their investment of sweat and tears into the design and interpretation of their work, as well as the execution. It is a further contention that extension of this idea within the teaching community will be for the ultimate good of students whether or not they become professional biologists. (This work is supported by f. e. w. (not to be confused with HEW)). - - -
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