

Letters

"Science" Round Table

Science recently proved admirably suited for an undergraduate honors biology seminar in which each student joined the AAAS and used his current issues as the text. The seminar, which met one hour a week for two semesters, was intended to bridge two troublesome academic gaps: the one which separates the content of the necessary textbook biology courses from new advances in contemporary research; and the other gap between the outstanding young students not yet deeply conversant in any speciality and the senior research faculty.

In *Science* the coverage is broad and the articles are short, and many of them are of major importance and general scientific interest. In addition, the editorials and news reports gave the student a sprinkling of spice: he read news of the academic community, he learned about some scientists' attitudes toward government, international affairs, and politics. Thus, he acquired a more realistic picture of scientists.

The main emphasis of the course was not to impart a specific body of established facts. Instead, by confronting the students with the dynamic momentum of current research, I tried to instill the attitude that "facts," whether they be in biology textbooks or in research journals, must be able to withstand a barrage of critical examination before being accepted.

With such an objective, examinations and tests were not given. We found a modified journal club format to be the most productive. At each meeting, one student reported on a single research article. For most sessions, we invited a scientist familiar with the general (or specific) field covered by the article to be presented. He served as a critic and filled in relevant background material. Most of these experts were closely familiar with the work being covered, and in some cases had even been involved in a controversy on the subject. Our objective expert's subjective remarks gave the student another realistic, lively glimpse of that abstract world of scientific research.

As in any seminar course, the success of each session depended upon the output of the students. The seminars varied in quality of presentation, but the majority were excellent. For most of the students, it was the first time they had to present material critically before a group of talented students and one to three faculty members. They soon realized, as they delved into their articles, how inadequately prepared they were. First they consulted their general texts, next the library, and then studied most of the references mentioned in the bibliographies of their articles. Each student spent an average of 20 hours preparing his seminar.

The topics covered were extremely varied and included such subjects as mutagenesis, regulation of development, bacteriophage genetics, hemophilia, muscle enzymes, visual discrimination, nutrition, immunosuppressants, voltage clamp studies on nerve cells, oxygenation of hemoglobin, visual pigments, biochemical changes in psychoses, role of galactosyl diglycerides, Mössbauer effect in audiometrics, piezoelectricity in otoliths, and skin sensory afterglows. Interest was highest at those sessions when an article contradicted or expanded upon material recently covered in the students' other courses.

The variety in the reports given was a special dividend for the instructor. Like most scientists, I find too little time to read many articles outside my own field. I am a biochemist working with invertebrates. Few of the subjects listed above are in my direct line of interest, but through the range of topics chosen by the students, I was compelled to broaden my scientific horizons into many areas where I normally would not linger. I found these excursions rewarding, refreshing, and humbling. Also, through such a format, these undergraduate students were enabled to fulfill one of the often forgotten purposes of a university, that of offering fresh insights—though often naively—to their professors.

By the same token, the students were impressed by the wide variety of subjects which a single instructor had to

examine critically. One student expressed the general reaction by commenting that such a broad approach "bolstered our understanding more than anything else, of the scientific attitude and outlook . . . The effect was subtle, and only looking back could I really perceive it."

HOWARD M. LENHOFF

Department of Biology and Honors Program, University of Miami, Coral Gables, Florida 33124

A Government of Laws, and Not of Men

Wolfe's editorial "Concerning dissent and civil disobedience" (5 July, p. 9), represents . . . unreal thinking. If one may disobey the law according to one's personal feelings then the only wrong that can be adjudged against Sirhan, Ray, or Oswald for their alleged offenses is that of resisting arrest, of "not accepting the consequences."

Personal physical violence is not included? Then how about destroying a man's home or business? No? How about just partially destroying them? How about hindering his means of livelihood? Where should the line be drawn?

The fact is that the basic statement is wrong. One is morally obligated to change a law he feels is wrong, not disobey it. As long as there are any legal means by which the law may be changed one must use them. The mere fact that a majority of people do not support the change gives no license to disobey, but only to work to make a majority see the need for the change.

No, I submit that "civil disobedience" in this country is wrong, a truly immoral act, and will remain so as long as we have a freely elected form of government and legal redress in the courts.

LESLIE M. BAGNALL

Department of Mechanical Engineering, Texas A&M University, College Station 77843

Wolfe quoted Justice Fortas on his moral and personal endorsement of open defiance of a law that the individual regards as unjust (a Negro in Birmingham in 1956). This is, of course, endorsement of civil disobedience as an ethically and politically acceptable instrument of democracy. Is this a rationally tenable interpretation of democracy?

. . . It could be said that Justice Fortas is too readily accepting a "dictatorship of the majority," which would