

# 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.

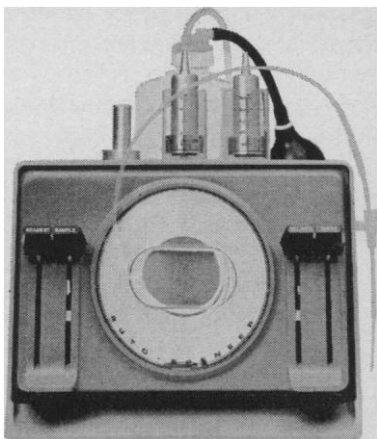
No, I submit that "civil disobedience" in this country is wrong, a truly immoral act, and will remain so as long as we have a freely elected form of government and legal redress in the courts.

LESLIE M. BAGNALL

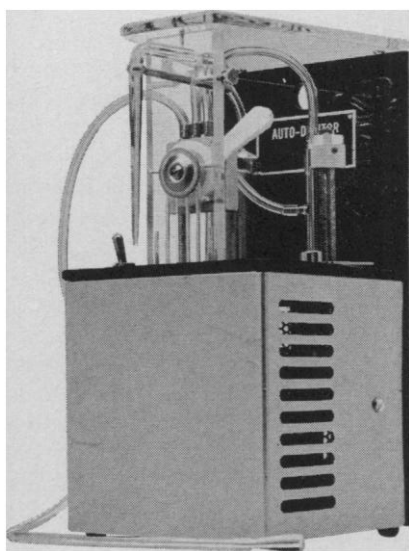
*Department of Mechanical Engineering, Texas A&M University, College Station 77843*

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



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be a misconception of the democratic principle. Ideally the responsibility of the governing majority is for the whole people. It seeks to reduce the differences in the common interest. Through use of the best possible intercommunication with the minority and the individual, it strives to dissipate tensions and win compromise, if not understanding.

Conceding a moral right to break the law would appear to be a confession of the failure of democracy. Our country has already yielded too much of the democratic ideal in the case of the "conscientious objector."

... But whether it is the legal exemption of the conscientious objector or the moral exemption of the self-justifying lawbreaker, the individual citizen becomes not only an independent moral authority but something of a lawmaker as well—all of which appears a bit anarchic to my mind. . . .

J. B. RHINE

*Institute for Parapsychology,  
College Station, Durham,  
North Carolina 27708*

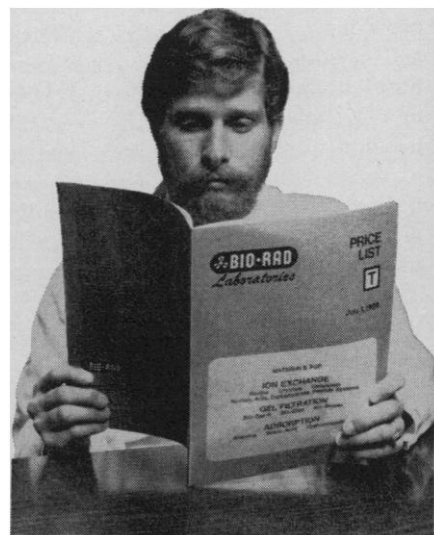
It is surprising to encounter solecisms in Wolfe's editorial. Justice Fortas, whose recent essay *Concerning Dissent and Civil Disobedience* stimulated the editorial, is permitted such legerdemain: Fortas is a lawyer, and lawyers are trained to confound and to employ logic dialectically.

1) The freedom "to speak freely and protest effectively" (*ex Fortas*) is activity and entails further activities. So it makes no sense to say that exercises of First Amendment rights must be judged by the consequent actions "rather than motives or thoughts." To imagine such a disjunction between motives, thoughts, and behavior is not only to subscribe to a passé legal fiction, but also to consign science and the intelligentsia to the status of a bauble.

2) Actions which "endanger others and infringe on their rights" are of course, *ex def.*, "unlawful" if reference is to positive law. (That is not quite accurate, since official action that endangers people *is* lawful, except in cases where subsequently it is officially decided to have been unlawful.)

3) To assert next that "the [legal] consequences must be accepted" by those who disobey laws which they deem to be immoral is to beg the question altogether—the question being, under what circumstances, if any, should the law be set aside to satisfy the claims of morality? The reasoning of the edi-

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torial could not distinguish Eichmann from Dr. Spock, because it values legal coercion for its own sake.

4) "The rule of law" is offered as the logical and ethical underpinning of this line of thought. To be sure, the rule of law is not a term of art among jurists. It is a political slogan which celebrates the values of compliance and due process. What it means is that disputes should be settled according to rules agreed upon in advance of the dispute, administered impersonally, and stated sufficiently precisely for people to be able to anticipate the risks of liability. Hence, "the rule of law" is procedural, has no substantive contents, and cannot possibly be relevant to political disputes in which the interpretation or validity of a particular law is in issue. . . .

Those who agreed with the sentiment behind Wolfe's editorial will be protesting to themselves that it was never intended to be understood in this way. That means that it was never intended to be understood, period; it was meant to be agreed with.

DONALD A. STRICKLAND  
Department of Political Science,  
Northwestern University,  
Evanston, Illinois 60201

The editorial stated that "the term *civil disobedience* is widely misapplied." That term can be defined as the refusal to obey civil laws, especially, as Webster's puts it, "as a nonviolent collective means of forcing concessions from the government." The alleged crimes of Messrs. Sirhan, Ray, Oswald, and Eichmann are in a different domain.

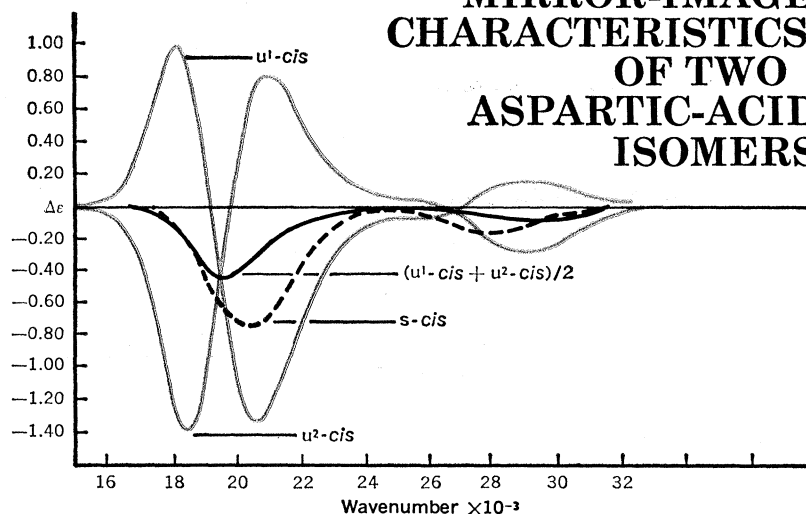
Bagnall briefly, and Rhine more fully, hope we can rely on majority rule. So does the true civil dissenter (but not the violence monger who may come along at the same time). He accepts the principle of majority rule; he wants the majority to change a law; when he concludes that other means of persuasion will not succeed, he uses civil disobedience to emphasize and dramatize his case. He is saying, "I believe this law to be morally wrong. I believe it so strongly that I violate the law and expect to be punished. But I hope thereby to convince you that the law is wrong and that you should change it." Although he is violating a particular law, he accepts what Strickland called "rules agreed upon in advance" or the editorial called "the rule of law."

The sentiment behind the editorial was, I thought, clear and cogent. It is the desirability, in a period of much

## CHEMICAL PROFILES

... drawn by Durrum

### PROVING THE MIRROR-IMAGE CHARACTERISTICS OF TWO ASPARTIC-ACID ISOMERS

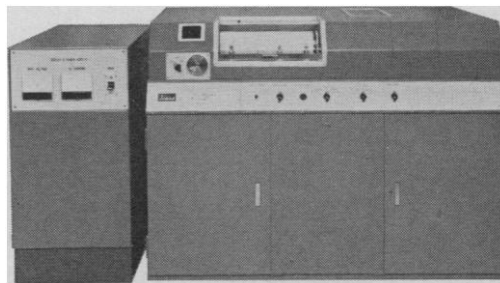


Aspartic acid, with its three donor sites, can form a variety of hard-to-identify chelate isomers. The circular-dichroism profiles drawn here, plotted from data gathered by a Durrum-Jasco CD recorder, are typical of the molecular detective work\* that can be achieved with this versatile instrument.

The steric requirements of aspartic acid indicate that in a cobalt-diethylenetriamine complex, three isomers will predominate: one *s-cis* (symmetrical), shown as a dashed-line profile in the drawing above, and two *u-cis* (unsymmetrical) isomers, shown in color. The latter are essentially mirror images of each other, and the Durrum-Jasco instrument provides a way to identify one from the other.

The configurational contributions to the CD traces of the two mirror-image isomers should, in theory, cancel out, leaving an "average" trace that approximates that of the *s-cis* isomer where there are no configurational contributions. As seen here, a very close correlation is achieved, proving that the two *u-cis* isomers are indeed pseudo-mirror images and providing clues as to their specific forms.

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\*AS REPORTED BY J. IVAN LEGG AND DEAN W. COOKE IN THE DECEMBER 20, 1967 ISSUE OF JOURNAL OF THE AMERICAN CHEMICAL SOCIETY.

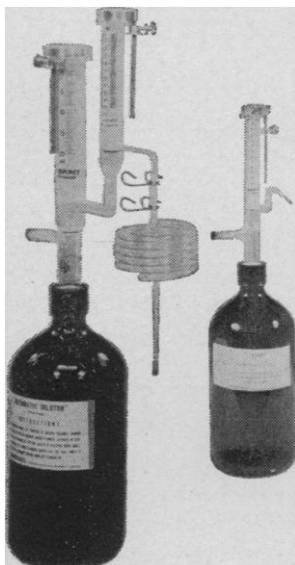


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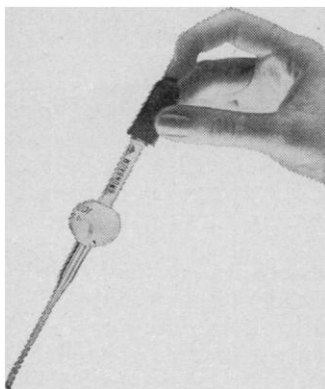


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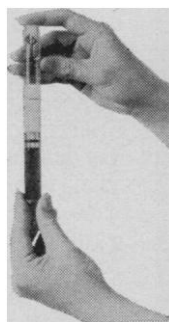
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controversy—which concerns a variety of issues and is expressed in a variety of ways—of understanding the constitutional principles concerning dissent and civil disobedience, and of discriminating among the various means by which disagreements are expressed. I am sorry Strickland misunderstood.

DAEL WOLFLE

## Funding: Long-Term or Annual

Two recent articles ("The status and problems of high-energy physics today," 5 July, p. 11; and "Government agencies preparing to reduce spending," 12 July, p. 143), and an editorial (28 June, p. 1400) have all emphasized how costly national scientific efforts become when there is uncertainty as to the actual amount of federal support forthcoming in a fiscal year. Perhaps the most spectacular instance of this was Project Mohole on which large sums were spent until Congress abruptly cut off further funds, and thus wasted the efforts of the scientists and all the money previously expended.

Under present appropriation procedures many projects are authorized by legislation which contains a specific dollar ceiling and expires every year. The ceiling must thus be reviewed annually on each extension by the House and Senate. Following this, appropriations must be considered in each house. This involves four separate instances when the fate of the program is at stake. In a 4-year program, this amounts to 16 reviews. The impact of such uncertain funding is obvious. Few businesses can operate on a short-term basis, and scientific research specifically requires long-term advance planning.

The present practice is not constitutionally required. Under many programs, funds may be voted to remain available until expended, as is done under long-term contracts in the federal highway program. Some authorizing statutes permit the appropriation of such funds as Congress may from time to time find necessary. There is no requirement for the present practice of specifying dollar amounts in authorizing legislation. The difficulty caused by the existing practice of enacting short-term authorization statutes with dollar limits on federal appropriations creates instability in research work and insecurity among researchers. With such uncertainty, many qualified experts have been reluctant to participate in a new