Letters

Second Thoughts on Shapiro's Defection

The letters on "Shapiro's defection" (27 Mar.) deserve some comments. The first by Fresco *et al.* is composed of many unrelated elements . . . and it is difficult to see the purpose of the letter altogether. Why, for instance, challenge the significance and priority of the scientific accomplishment which is at the origin of the political discussion? This is appropriate in a scientific paper but should not be used for detracting validity from a moral point. One should be allowed to express his moral concerns, related to his own scientific accomplishments, without being accused of immodesty or of inability to recognize the limits of his own discoveries. What I object to is the implicit personal attack which degrades everybody, the attacked and the attacking, as well as the moral issue itself.

It is undeniable that in the excitement of the arguments exchanged in the press, some exaggerations and distortions have occurred. This is inevitable. For instance, the suggestions of Shapiro's personal sacrifice, presumably an interpretation of the journalists, are psychologically wrong. No freely chosen decision is a sacrifice. Also, in an earlier comment by Beckwith and Shapiro [*Nature* **224**, 1337 (1969)], contemporary events, the interpretation of which cannot be dispassionate because they lack sufficient historical perspective, were cited as examples of genocide. Personally I do not share their opinion about Biafran and Palestinian genocide, and I hope they also regret the fact that their more emotional statements have served to detract from the primary issue which they raised. However, these mistakes should not deter us from perceiving the central points in the debate. First, to cast some doubt about the priority of science over other human activities is a moral attitude and cannot be labeled anti-intellectual. Which one of these activities should have priority at the present time depends on the urgency for satisfying the needs of humanity at large and not only those of Western civilization.

Second, it is important to stress (as Beckwith and Shapiro did) that the only way to prevent misuse of our scientific discoveries is by introducing morality and social responsibility into our governments. Therefore, it is not only advisable, but imperative, for a scholar to be politically active. Finally, there is a common tendency, clearly visible in the Fresco letter, to consider the community of scientists as a leading social elite. It seems obvious that scientists should share experiences and responsibilities from a position of equality with all other sectors of the society if efforts to bring peace and justice in a more livable world are to be successful.

The second letter of Kallfelz does not deserve any additional comment except that it is even more personally directed. In my opinion it was inappropriate for *Science* to have published such insinuations aimed at the sincerity of Shapiro's motivation. If I may add my personal views on Shapiro's "proverbial wealth," I hope that it will be saved for political action in securing people's rights and not wasted in giving to charity which is bodily alleviating but spiritually degrading.

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Frustrations of Mislabeling

We believe a useful purpose will be served by adding to the report of Goldman (Letters, 16 Jan.) concerning the reliability of labels on radioactive biochemical products. Within the last 8 months the following costly incidents occurred in our laboratory.

1) A compound labeled [C^{14}]thymidine contained no detectable [C^{14}]thymidine but probably contained [C^{14}]uridine.

2) Two vials of [H^3]thymidine from the same company were labeled with approximately the same specific activities (within 10 percent). The specific activity of one was in fact five times the specific activity of the other.

3) Two vials of [H^3]uridine from the same company were labeled with approximately the same specific activities. The specific activities were different by threefold.

4) A bottle labeled [C^{14}]acetic acid contained [C^{14}]acetate.

5) Wipes taken on several vials of [P^{32}]PO_4 have shown the presence of radioactive contamination. With one vial of labeled PO_4 half of the contents (1 mc) had leaked out during shipment.

These incidents have cost us between $2000 and $3000 in lost man-hours and materials, not to mention delays and frustrations with research and the possible health hazard with the labeled PO_4 vials. Possibly other researchers have had difficulties with experiments due to defective isotopic compounds without realizing the source of trouble. We have notified in detail the two companies that caused our problems, and we would be willing to give further details to any individual who considers the information pertinent to his work.

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Inflexible Page Charges

Banks suggests (Letters, 10 Apr.) a method of publishing scientific articles different from that currently in use. Instead of printing and mailing complete journals to all subscribers, he suggests putting each article on microfilm and providing "hard copies" only on request. This and similar schemes have, of course, been proposed before (*1*); there is some merit in them, and they are currently being explored on an experimental basis in at least two disciplines [see, for example, a description of the Mathematical Offprint Service (*2*)]. I do not propose to enter into the arguments for and against the schemes, but I would like to correct one misapprehension on Banks' part which may be shared by other publishing scientists. He claims that "if publication were carried out on this basis . . . publication charges to authors' institutions could be reduced about 50 percent." This is not true.

Authors' page charges are calculated in such a way as to cover the costs of producing the *first copy* of his article. These costs include those of editing and reviewing, copy-editing, reproduction of

figures and tables, and type composition and correction. All the other costs —of printing, binding, and mailing multiple copies—are recouped from other sources of income to the journal (subscriptions, sale of back issues, and advertising). Now the costs of producing a single microfilm copy are the same as those of setting a single copy in type: reviewing, editing, and copy-editing costs are unchanged, and one needs, instead of a skilled compositor, a skilled typist (with multitudinous special attachments to cope with the complexities of scientific work) plus a microfilmer. Hence the page charges would be unchanged.

Incidentally, it should be pointed out that several leading journals are now available in microfilm or microfiche as well as in the conventional form. They remain cumbersome to read or consult.

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1. W. S. Brown, J. R. Pierce, J. F. Traub, *Science* **158**, 1153 (1967).
2. M. Scal, *Sch. Publ.* **1**, 71 (1969).

Deterioration of Teaching

In describing the hue and cry over a retrenchment in support of higher education and science, the ex-advisors apparently did not mention that the quality of the teaching staff in higher education has been deteriorating for some time ("Recession in science: ex-advisors warn of long-term effects," 1 May, p. 555). The decline in quality—measured by the percentage of full-time senior teaching staff with the doctorate—set in several years ago, long before talk of curtailing the support of graduate education.

A 1963–64 study of James F. Rogers (*1*) showed 49 percent of the full-time senior instructional staff held the doctorate. A 1966 survey by R. Beazley (*2*) showed the percentage had declined to 43.7. Preliminary findings of another survey indicate it may have dipped to 42 percent in 1967.

Increasing numbers of freshmen students are enrolling in 2-year institutions where only about 10 percent of the teaching faculty held the doctorate some 10 years ago and where only 6 percent held the degree in 1966. About 35 percent of the fall 1969 first time enrollees entered 2-year institutions, a percentage that is rising.

The percentage of full-time instructional staff with the doctorate is an inadequate measure of the quality of education, but at present it is about all we have. It is directly relevant to the need to produce more doctorates with the view to assuming teaching responsibilities, particularly in the burgeoning institutions below the rank of universities.

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1. J. F. Rogers, *Staffing American Colleges and Universities*, Report OE-53028 (U.S. Office of Education, Washington, D.C., 1967).
2. R. Beazley, *Numbers and Characteristics of Employees in Institutions of Higher Education, Fall, 1966*, Report OE-50057-66 (U.S. Office of Education, Washington, D.C., 1969).

Biology Editors' Definition

An ad hoc Committee on a Proposed Definition of a Primary Publication appointed by the Council of Biology Editors has developed the following definition which was adopted by a vote of the full membership of CBE on 23 May 1968:

An acceptable primary publication must be the first disclosure containing sufficient information to enable peers (1) to assess observations, (2) to repeat experiments, and (3) to be susceptible to sensory perception, essentially permanent, available to the scientific community without restriction, and available for regular screening by one or more of the major recognized secondary services [e.g., currently, *Biological Abstracts, Chemical Abstracts, Index Medicus, Excerpta Medica, Bibliography of Agriculture* (since discontinued), etc.] in the United States and similar facilities in other countries.

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Progress in Desalination

Gerard (Letters, 20 Mar.) presents a distorted picture of the potential of desalting when he states that only 5 percent of all operating plants show costs below $1 per 1000 gallons. It is not the *number* of plants that is pertinent but the date of construction and the size, since costs have gone down both with improved technology and