NSF: Influencing Appropriations

Carpenter's letter (13 Nov.) takes issue with Greenberg's critique (25 Sept., p. 1291) of the Daddario subcommittee's influence on appropriations to the National Science Foundation. Carpenter argues regarding "the power of the appropriations subcommittees vis-à-vis the authorizing committees" that the latter "do exercise great influence, particularly when they also handle annual authorization bills." Specifically, he suggests that "an objective analysis would show substantial effects of the National Science Foundation authorization hearings on appropriations this past session" and that these annual hearings "will have a key role in the . . . future federal patronage of science." This argument deserves several comments.

First, it is undoubtedly true that authorizing committees exercise some influence over the actions of appropriations committees, but this relationship is one of the least studied and least understood aspects of congressional behavior. Moreover, the differences between Senate and House are substantial: Senators are permitted to be, and are, members of both appropriations and authorization committees; members of the House Appropriations Committee, like members of Ways and Means, and Rules, may not be members of other House authorization committees, reflecting the greater division of labor in the House than in the Senate, and the widely acknowledged power and prestige attached to these "exclusive" House committees. Second, it would be very difficult to demonstrate the particular effects of the single factor of the NSF fiscal 1971 authorization hearings on the complex legislative outcome of the NSF fiscal 1971 appropriation compared, for example, to the effect of a more politically sophisticated NSF director in McElroy than in his predecessors. Third, Greenberg's article and Carpenter's letter suggest the need for careful analysis of the political behavior of the scientific community in seeking desirable outcomes from Congress, the relative attention they pay to appropriation and authorization committees, and the effect of this distribution of attention on outcomes.

Finally, it is a bit disingenuous to suggest that "Senator Lister Hill chaired the Labor and Public Welfare Committee and thus influenced the course of the National Institutes of Health," and fail to point out that there are no annual authorization hearings for NIH, that Hill concurrently chaired the Senate Appropriations Subcommittee which appropriated funds to NIH, that the action was in the appropriations subcommittee far more than in the legislative committee, and that Hill's alliance with Representative John Fogarty, his counterpart as chairman of the House Appropriations Subcommittee, was the significant feature of the NIH success story.

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College Grades—Success in Life

A reply is in order to the comments made (30 Oct.) by Feiring and Korn and Sicé to my letter of 3 July regarding the relationship of college grades to postgraduate success, not only because their letters serve to perpetuate the myth of no relationship, but also because the issue is one that is important to any instructor who grades students.

Feiring and Korn refer to a review by Hoyt (*1*). Although Hoyt did conclude that the two variables were uncorrelated, a careful reading of his paper suggests that he could have come to quite a different conclusion. Of the approximately 47 studies he reviewed, 25 reported a statistically significant positive relationship between grades and later success. The remainder showed insignificant correlations and no study showed a significant negative correlation. Hoyt was quite properly critical of many of the studies on technical grounds, but seemed to throw them all into the same bag when he made his summary conclusions. When the studies are grouped into the scientifically "more adequate" and "less adequate," the score for the more adequate studies is 20 significant positive and 4 insignificant correlations, whereas that for the less adequate studies is 5 significant positive and 18 insignificant. Other psychologists might use different standards than mine in judging the adequacy of the studies, but their conclusion would probably be the same: the better the study, the greater the likelihood of finding a significant positive relationship between grades and later success. Hoyt also classified the studies according to areas of postcollege success: business, education, medicine, and so forth. His final category, "eminence," included six "more adequate" and only one "less adequate" study, and all six of the better studies showed significant positive relationships between grades and later success. The results of this latter group were similar to the findings of Oden (*2*), whose omnibus criteria for success showed rather clearcut distinctions in grades between the more successful and the less successful of Terman's subjects.

The point raised by Feiring and Korn as to the sociopsychological correlates of grade-getting seems irrelevant to the main issue. Our awareness that socioeconomic background, personality factors, avoidance of self-destructive behavior, and the like are all related to grade point average and other success variables should not in any way prevent us from giving particular help to those students who need it in order to succeed. Telling students that there is no relationship between grades and postcollege success does not seem to me to serve their best interests.

Having said this, a qualification is in order. The correlation between grades and postcollege success is never very high, seldom over .30. (As such, it runs about as high as the relationship between scores on the better measures of personality and measures of trait-appropriate behavior in, say, social settings.) The more that postcollege success criteria resemble those used by college instructors, and the more reliably they can be measured, the higher the correlation with grades. Eminence fits the specifications, as Hoyt's review shows, and so does creativity in science, for Taylor and Ellison (*3*) found that scientists whose grades put them in the top tenth of their college class had a greater chance of being recognized as creative. A second point is that relationships between grade point average and later success are more pronounced at the extremes, which helps explain why eminence stands up so well as a criterion.

As to the points raised by Sicé, I think we all realize that once decisions are made to admit to medical school or any other graduate school only those students who are in the top third, quarter, or decile of graduating classes, the restriction in range makes the computation of correlations between undergraduate and graduate success a futile business.

Although the evidence supports the conclusion that in general terms college performance tends to predict later success, I believe that we can and should do much to improve present evaluation, integrate it more fully into instruc-

tional processes, and use it as feedback to help students self-actualize. I think we should also be aware that poor grades often reflect instructional, as well as student, deficiences. But let us not mislead ourselves and students by stating that college evaluation, even as presently conducted, is worthless when it comes to predicting success in later years.

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Arsenic and Phosphate: Measured by Various Techniques

It was interesting to note (*1*) that the Soap and Detergent Association and the enzyme manufacturers took Angino *et al.* (*2*) to task for what they seemed to regard as an irresponsible discussion of the occurrence of arsenic. . . . Now that the subject has been brought up I would like to add our experiences. We, too, have been finding arsenic in waters—in lake waters to be exact. In ten Minnesota lakes the concentrations of arsenic found in filtered surface waters taken in the fall were 7, 9, 11, 16, 22, 36, 105, 132, 216, and 224 μg/liter, respectively. The last four are well above the Public Health Service's limit for drinking water, but as lakes are not considered drinking water these days I have refrained from calling public attention to these figures. Indeed I have gone out of my way when asked about them to point out that they probably are not harmful. In this way I suspect more has been gained in peace of mind than has been lost in toxicity. (I do not mean to imply that if we close our eyes our problems will go away. On the contrary I believe we should keep our eyes and minds open, but perhaps our mouths shut, until we know what we are saying.) However, these numbers *are* very important for a different reason than health. Most investigators interested in lake pollution are measuring phosphate by some modification of the so-called Harvey method: usually by a molybdate–stannous chloride procedure. This procedure does not distinguish between phosphate and arsenate (the form in which most of the arsenic is present) and so many measurements are undoubtedly wrong in studies where arsenic is present at the concentrations we find. In fact, to give an example, the lake having an arsenic concentration of 224 μg/liter had a concentration of phosphate, by the Harvey procedure, of 104 μg/liter, but a bioassay showed the concentration of phosphate to be less than 1 μg/liter. Clearly if we hope to correlate algal growth with phosphate concentrations or fluxes we must do better. Some investigators who use the so-called Stephens technique may avoid the error somewhat but even this technique is not completely free of arsenate interference. I would recommend that those engaged in measurements of phosphate in lakes be aware of the problem and if it exists try the method we have found that completely eliminates the interference (*3*).

The source of the arsenate is probably from its addition to lakes as sodium arsenite to kill rooted aquatic plants. In Minnesota, records show that from 1956 to 1969 over 900,000 pounds of the chemical were applied. In New York State, from 1961 to 1966, about 85,000 pounds were used and it is likely that even greater quantities have been spread about in other states. The arsenite rapidly oxidizes to arsenate and, because of its relatively low involvement in biological processes, seems to have a long half-life.

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Doctor of Arts Degree

In his editorial (6 Nov., p. 586) H. Guyford Stever suggests that the rationale behind the Doctor of Arts degree is to fill a gap between the more research-oriented universities and the secondary institutions, the state and junior colleges. It is primarily to these institutions that students would go for training as teachers and it is these institutions that would be expected to absorb the holders of the new degree. I take exception to Stever's contention that new degrees must be created to