Coffee-Easies and Bacon-Pushers

Cancer research, the Food and Drug Administration, and the Delaney clause of the Food, Drug, and Cosmetic Act of 1958 (that is, prohibiting anything that causes cancer in man or animals from being added to food) are not within my field of research. Nevertheless some honest and unbiased perspective in this area is obviously needed—as was dramatically emphasized in Barbara J. Culliton's recent report on the New York Academy of Sciences' workshop on the Delaney amendment (News and Comment, 16 Feb., p. 666).

Caffeine is an excellent carcinogen, according to various workers who have the appropriate background. So too, I wager, is strong brine (sodium chloride solution) when properly applied.

Therefore, I urge that someone inject intrauterine, 50 times normal concentrations of caffeine (better yet, coffee, if possible) in rats and (insofar as possible) similar concentrations of brine. The brine would probably have to be applied by periodic lavage because of simple osmotic problems.

Logical implications and prognoses upon successful completion and publication of such work are mind-boggling, for example, coffee-easies complete with secret knocks, passwords, and little windows in the door; "nickel-bags" of salt; a new Brackish-brown Mafia conscientiously battled by a new Elliot Mess and the Unflushables; and, perhaps, even a dramatic decrease in the welfare rolls. Further, since today the campus often seems at the core of such movements, I might even supplement my academic pittance as a bacon- or pickle-pusher.

FRANK J. LITTLE, JR.
Department of Biological Sciences, State University of New York, Brockport 14420

Research Planning

I agree with the statement DeWitt Stetten, Jr., made in his editorial (18 Aug. 1972, p. 565) that the asking of nonquestions "may be more common than is generally supposed," but I take vigorous issue with his suggestion that asking how research is planned is a nonquestion. I suggest instead that the asking of nonquestions is all too often a characteristic of nonplanned research; indeed, the essence of research planning is in deciding what questions to ask of nature. For example, "What bit of knowledge or information am I seeking?" "What hypothesis is the experiment or investigation designed to test?" "What kind of data or observations will the experiment or investigation produce?" "What will I do with the data I get, and are they adequate for refuting this or any alternate hypothesis?" (*1*). I submit that these and similar questions are either deliberately or intuitively part of Szent-Györgyi's nocturnal digestion of the day's work.

To suggest that research is a form of intellectual endeavor that cannot be planned is to take an extremely elitist view of what research is, to do a disservice to science, and to invite boondoggles masquerading as research. In view of Stetten's position, I sincerely hope that our difference of opinion on this matter is semantic rather than substantive.

U. V. HENDERSON, JR.
3435 Cooper Road, Richmond, Virginia 23225

References

1. J. R. Platt, *Science* **146**, 347 (1964).

Stetten does the scientific community and the public a disservice by attempting to perpetuate the myth that research cannot be planned. He confuses the often, but not always, unplanned scientific achievements with the research that leads to them. Research is customarily preceded by a careful analysis of existing knowledge, which provides the basis for the selection of objectives, and the subsequent painstaking design of essential experiments. All such activities preparatory to the actual performance of research—whether dealing with intellectual challenges, or their translation into the marshaling and deployment of resources—fall within the realm of planning.

The scientist, of course, knows all this. He is well aware that the preparations for, and the pursuit of, research are arduous, often involving tedious and time-consuming operations. He is prepared to engage in such efforts because he believes that the results, even though they may not lead directly to a new paradigm—the equivalent of blazing a new trail—will be worth the effort. While he would not deny that great achievements may result from the sudden flash of insight—usually to those who are well prepared—he would also emphasize the importance of the many perhaps mundane contributions without which major scientific advances would not have occurred.

For the public and their representatives, on the other hand, scientific research has been largely viewed as a serious if somewhat esoteric activity, supported in the expectation that it will produce certain benefits. By portraying research as a game of chance involving talented players, Stetten conveys an image of scientists engaged in arbitrary activities without specified objectives. To expect the public to pay for such activities and their various infrastructural elements without even a vague assurance of the existence of scientific objectives, much less an understanding of their societal consequences, seems presumptuous, to say the least.

BERNARD R. STEIN
6727 Rosewood Street, Annandale, Virginia 22003

Possibly, as Henderson suggests, the differences between Henderson, Stein, and me are largely semantic. Stein, in his first paragraph, enumerates many of the preparations which are traditionally undertaken before engaging in a research program. I also listed similar preparations. I would take exception to his describing these activities as "planning." To me, planning means quite simply *the determination of where to go and how to get there.* Thus, one might plan a tour of the capitals of Europe. One can do this because the trail has previously been blazed, and there are excellent maps available. I have, in addition, my bias as to the meaning of the word "research." As Szent-Györgyi has written, research means going out into the unknown in the hope of finding something new. Within the limits of these two definitions, how can one usefully plan research? Objectives one must have, but these are a far cry from meaningful plans. One may, of course, confine one's activity to previously charted areas, in which case one would be delinquent not to plan. Such an activity, although it might be interesting, would not in my opinion meet the definition of research. I furthermore do not see that this viewpoint is "esoteric," "elitist," "arbitrary," or "presumptuous." It is simply a consequence of the nature of the unknown. Incidentally, I agree wholeheartedly with the second paragraph of Stein's letter describing the activities of the research scientist. It is noteworthy that the word "planning" is not mentioned in this paragraph.

DEWITT STETTEN, JR.
National Institute of General Medical Sciences, Bethesda, Maryland 20014