LETTERS

Metric Slips

Science! Your metric system is showing! The cover of the 15 August issue features an Anangula core "... about 5 meters across." This would be more than 16 feet, quite something for a piece of stone from which blade tools were removed by the early Aleuts.

Now comes the Olmec stone sculpture pictured on the 5 September issue which is said to be "2.75 millimeters in height." Again, this is impossible. The sculpture is more like 2.75 meters in height.

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I note that the tool core on the 15 August cover is presented as being 5 meters across. A blade from that core would not need to be very sharp. Lethal results could be obtained by simply dropping a multiton spearpoint on the quarry. Tough people, those Aleuts.

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The Anangula core on the 15 August cover is about 5 centimeters across; the Olmec bas-relief carving on the 5 September cover is 2.75 meters in height.—ED.

Controversial Areas of Research

The generally admirable editorial "Freedom of inquiry" by DeWitt Stetten, Jr. (19 Sept., p. 953), perpetuates a common confusion between two nearly unrelated questions: (i) Is a certain experiment dangerous? (ii) Is knowledge of certain kinds dangerous or undesirable?

It is obvious that some experiments cannot, or should not, be performed because they are harmful, or merely too expensive. No scientist would defend an experiment which entailed the certain death of even one person. That is no reflection on the knowledge which might be obtained. If the knowledge appears worth pursuing, one looks for another way to find it.

There have always been some who maintain that knowledge in some areas is undesirable because it might destroy beliefs deemed salutary. The beliefs used to be religious; now they are more often political or racial. This position is seldom taken openly, because the mere attempt to impose censorship creates an immediate presumption against the censor. It is only falsehood, not truth, that need fear critical examination. Everyone committed to science must utterly reject and oppose the doctrine that ignorance is better than knowledge, self-deception better than intellectual honesty, faith better than thought.

Knowledge is logically prior to ethics because sound ethical decisions can be made only on the basis of truth. An ethical principle may preclude some means of obtaining knowledge, but it must not be allowed to suppress knowledge that might change the principle.

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I would like to take exception to Stetten's editorial, for I believe he has misconstrued the whole tenor of the arguments for and against the advisability of conducting various lines of scientific research. The furore is not over scientific research per se, but over scientific research in certain political and social settings. Stetten lists "lines of research against which voices have recently been raised," but most of these items involve not a "research line" but a social and political question.

1) No one is arguing that research should not be done on the genetic contribution to intelligence. What many of us are against is the linking of this question to the political and social question of race, à la Jensen and Shockley, when these latter do not even, and perhaps cannot, define race nor, for that matter, intelligence ("intelligence is what intelligence tests measure").

2) The kinds of experiments to be properly performed on consenting adults, minors, fetuses, and prisoners is not only a scientific question but involves important social policies, and the arguments in most cases are against the social policies which allow for the experimentation rather than the caliber of the science.

3) The screening of infants for a variety of genetic defects is not done in a vacuum, with results to be tabulated in a scientific publication, but with results which have important effects upon the views of a society with regard to disease, and life and death themselves.

4) Experiments in artificial insemination, abortion methods, cloning, and in vitro fertilization again take place in a society which has set standards and codes of behavior for its members, and any tampering with these must take in the views of all members of society, not just scientists.

In all the above examples, I disagree with Stetten that "judgments will surely be

individual." When the possible consequences of scientific research react upon a whole society, the judgments must assuredly *not* be individual. In contradistinction to Stetten's concern for a possible limiting of the freedom of inquiry in scientific research, I believe that nothing would be more disastrous for scientific research than for us to set ourselves up, not only as the sole judges of the scientific results of our research, but also as sole judges of the effects of this research upon society as a whole. I do not question the "ethics and humanity of scientists"; what concerns me is the attitude of many scientists that there is nothing more important in the world than what they consider is the God-given right for them to do research, and that no question of morality, of ethics, of social or even political judgments should interfere with this right. In a democratic society, no man, scientist or nonscientist, should stand alone upon this pinnacle.

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Stetten suggests the criterion of a "real and present danger" as a way of judging whether constraint on research is needed. This is a clear and extremely useful criterion. But a criterion which may be more important is that of unintended and future danger. Granted that this criterion is not as precise or easy to handle as the "real and present danger" one; nevertheless in many areas of research it will be the long-term effects that are the most problematic. We are no longer in a position to be as cavalier about the future as we once were. Our knowledge of the ecosphere has shown that simple actions may have far-reaching and wide-ranging consequences. An examination of the long-term effects of research may not discover problems that are there, but we will have been responsible to ourselves and our future. Nor will looking at both present and future dangers eliminate all risks in research, but some will be discovered, and for this we will be better off.

I agree that the general analogy between freedom of inquiry and freedom of speech is a valuable one for thinking through the problem of restraints of research, especially if one were to include the tradition of academic freedom. We should remember, however, that there ought to be an ethical evaluation of both, and that while the law may suggest that certain forms of expression or research are legal, that in itself does not make them ethical. Freedom of speech does not imply a right to say whatever one wants, whenever one wants. Freedom of inquiry should operate under at

least the same restraint. When one uses the rubric of freedom of speech, freedom of inquiry, or academic freedom, one ought always to remember that such freedoms are qualified by the rights of others, the intrinsic values and circumstances of the situation itself, and the short- and long-term consequences of the action.

A continued discussion of the ethical values in science and research is necessary because of the importance of the issues themselves and the consequences the resolution of these issues may have for the community. Stetten suggests that soon we may place such discussion behind us and get on with the work of science. The only problem is that if we leave ethical discussion and evaluation behind, who will know, who will decide, and what will be the criteria for resolving the questions that "pose a real danger to the community, the environment, or the individual."

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The three letters of Arents, Siekevitz, and Shannon present interesting contrasts reflecting the divergence of opinions about the issues raised by my editorial. Arents finds that knowledge gained through science must take precedence over ethical judgments. Siekevitz would place research into a preexisting political and social setting. Shannon suggests that future dangers should be considered along with present ones in evaluating research proposals, a view to which I subscribe. I had intended "present" as an antonym of "absent," not of "future."

The hazard to science and to society which concerns me is that which we witnessed in the unlamented era of the late Senator Joseph McCarthy, when suspicion of adherence to an improper political view could jeopardize pursuit of a research protocol. It mattered little whether the political view was of the right or of the left. The censorship was, in its broadest sense, political, but few will subscribe to the notion that it was good. The extent to which political forces should influence the selection of supported research programs is debatable and will continue to be debated. In my view, the balance point in this conflict between science and politics will continue to oscillate back and forth, and it was on this assumption that I forecast that some restoration from the present, fairly extreme positions may be anticipated. I never intended that this discussion should be placed behind us, as Shannon suggests toward the end of his letter.

Whereas the marriage of science and politics may be stormy, that of science and

ethics seems to me to be vigorous and healthy. In the judgment of a research project, as conducted at the National Institutes of Health, ethical and scientific values are usually separated. The scientific merit of a project is judged by peers, while the ethical and legal aspects are referred to committees of special competence both of the grantor and of the grantee institution. The machinery for effecting such review is currently under scrutiny and being reformed, and should continue to be studied and improved. Where human subjects are concerned, various safeguards are incorporated, and these are expanded to take care of the special problems of those who can not freely give informed consent.

These points are not at issue. What is at issue is the case of the project which has passed a merit review, has been repeatedly approved by all the properly constituted ethical review panels, and is then threatened or forced to termination by acts of intimidation, harassment, and personal polemic. These techniques may all be part of the political system. They would all have been familiar to Senator McCarthy. They are, in my judgment, damaging to the cause of both science and society.

I am puzzled by Siekevitz's attack upon the personal nature of judgments. It appears self-evident to me that all rulings and decisions by panels and committees and, indeed, by the entire electorate are mere summations of personal judgments. In view of the several personal judgments which he makes in his letter, whence comes the authority to deny like freedom to the rest of us?

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Congressional Fellows

Recent articles by Constance Holden (News and Comment, 12 Sept., p. 860) and Barbara Culliton (News and Comment, 19 Sept., p. 977; 26 Sept., p. 1071) admirably describe several new programs designed to put scientists to work on Capitol Hill. However, the opportunities for scientists to participate in the policy process are even richer and more extensive than the authors suggest.

Initiated in 1953, the American Political Science Association's (APSA's) Congressional Fellowship Program has, since 1961, included professional employees of federal agencies. A significant number of the 266 career civil servants who have served on the Hill as APSA congressional fellows are scientists: physicists, chemists, biologists, mathematicians, and astronomers, as well as psychologists, economists, sociologists, and political scientists. They come from many agencies and have found their special talents highly valued by the Congress. One such scientist, Thomas Ratchford, who came to the program from the Department of the Air Force, has put his personal experiences as a congressional fellow directly to use as a science consultant to the House Committee on Science and Technology. Others are utilizing their acquired knowledge in key science positions in federal agencies.

At the same time, several hundred social scientists (primarily political scientists) have come directly from universities to work in Congress as congressional fellows.

Several operating principles have worked to optimize the internship experiences of fellows. First, each APSA fellow serves in both the House and Senate. This helps them understand the dramatic differences between the two Houses and makes them aware of the discontinuities that exist in the legislative process; it also extends their network of contacts on the Hill. Our experience has demonstrated that outstanding professionals can make substantial contributions and derive substantial benefits during relatively short (4- to 5-month) periods in each House.

Second, we believe it important that all fellows approach the Hill with humility. While the special skills and perspectives of scientists and other nonscience professionals are highly valued in Congress, it is easy to underestimate the present capabilities of congressional staff in this regard. Our experience suggests that the primary benefactors of these programs are the fellows and the professional communities from which they come, not the Congress.

Third, fellows are more likely to understand the Congress and the policy process if their peers in the program have diverse professional backgrounds and perspectives. Scientists have much to gain by having as colleagues legal services lawyers, foreign service officers, political reporters, authors of books on Congress, and so forth. Professional careers tend to foster specialization and parochialism. The APSA program facilitates a broadening and sharing of interests among outstanding professionals.

For these and other reasons, officials of the Robert Wood Johnson Foundation and the Institute of Medicine asked APSA to include the new health policy fellows within its program (an important fact omitted in Culliton's article). We have all benefited as a result of that decision.

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