the impression from it that a trance-like state was experienced by Sirhan throughout the whole tragic episode which was indicative of his deranged frame of mind. It occurred to me that such testimony, which conceivably could be used to support a hypothesis of temporary insanity, is actually evidence for the existence of retrograde amnesia brought about by the shock of the incident.

The retrograde amnesia effect is a well-known and highly reliable phenomenon and has been extensively investigated. Readers will find an excellent report on the phenomenon by McGaugh (*1*). Retrograde amnesia refers to the memory loss of those occurrences immediately preceding a sudden stimulus event. In most cases the stimulus is intense; an electric shock to the cortex is often used experimentally. However, simply a mild, but unexpected, verbal item has been known to suffice (*2*).

If retrograde amnesia is a plausible cause, then a rather interesting question occurs concerning the legitimacy of a plea of temporary insanity. Is it not possible that the assassin is truly in complete control of his faculties up to the moment the victim is felled? The situation that ensues would be intense (traumatic) and, for the murder, unanticipated since it is probable that no thought is given to events beyond the assassination itself. Thus the circumstances which follow the killing might serve to erase or weaken the memory of the events that preceded, thereby giving an illusion of insanity existing prior to and during the bloodshed. Comments from those who are closer to this effect than I may cast some light on the nature of acts such as these.

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References

1. J. L. McGaugh, *Science* **153**, 1351 (1966).
2. E. Tulving, *ibid.* **164**, 88 (1969).

Public Policy: Analyses and Criticism

In his editorial "Public challenge of government action" (2 May, p. 499) Skolnikoff touched on a matter which should be of concern to every country, certainly every technically advanced country. That there is growing international concern is evidenced by the formation of the British Society for Social Responsibility in Science. Skolnikoff came close to stating the solution when he said "it seems clear that what is needed in our political process are new independent mechanisms charged with a task of developing information and analyses of important areas of public interest that have major scientific and technological content." My only objection is to the insertion of the word "new." I see no need to look for the creation of new mechanisms.

I agree that at the present time the universities are not in a position to be this "mechanism" for two reasons. First, the majority of them are too dependent on government for their very financial existence and one cannot yet be assured of the complete objectivity of the political process to be willing to generously support institutions which might emerge as severe critics; and second, the internal struggles going on within most universities of the world today have not yet produced the new form of governance of universities that will lead to a return of the necessary stability to engage in sustained intellectual activity on matters of major public concern.

However, there are organizations such as the AAAS in many technologically advanced countries (unfortunately not yet in Canada). Surely the main burden of Skolnikoff's editorial is a plea for mechanisms to ensure the advancement of science to the benefit of mankind and this should be central to the activities of the AAAS.

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Scientists in universities and research institutes are presently "facing their moments of truth," according to an editorial by Patrick P. McCurdy (*1*). The moments of truth are double-edged in that they concern the ethics of scientists as regards the use to which their research may be put, and the increasing problem of financing their research. Following a lecture I recently gave at the Berkeley campus on the general subject of the social responsibilities of a scientist, an intelligent and well-meaning student suggested that perhaps the best thing we scientists could do for mankind would be to quit work!

What possible avenues are there for the social-minded scientist to follow, besides the usual ones related to dissenting political activities?

1) He can remain aloof to the social problems and "do his thing," a currently popular choice.

2) When budgets are cut, he can adapt and sharply curtail his research with the hope that things will get better.

3) He can enter into the fight as an administrator, politician, or negotiator. After a short period of time, he will most likely cease to be an adequate scientist.

4) He can remain a full-time scientist, but do his work in areas with direct and obvious social goals such as those in medicine and agriculture. This may involve a difficulty in maintaining one's professional competency while, at the same time, avoiding involvement in trivial research.

5) He can remain a scientist and be fully active in his particular discipline, yet contribute to social actions as an expert in his field. He would follow his own conscience as to the social consequences of his research.

A simple course of social action could satisfy the last alternative. The scientist could communicate with nonscientists—for example, within a large group such as the newly formed British Society for Social Responsibility in Science. Or his communication can be performed as an individual speaking to civic and service groups, or by publishing in the general news media—any method that requires him to stand up and be counted!

How one selects areas for social action depends entirely upon the individual and the type and breadth of his training. Many biologists are capable of discussing conservation and ecology and the possibilities inherent in biological warfare. Biochemists, chemists, and physicists are qualified to discuss radiation problems, and so forth. This type of action, of course, brings problems. When does one consider himself an expert? In any event, he must keep his statements in line with known facts.

The communication approach is a tough one, and anyone engaged in it can expect to be attacked. But there are also rewards—not the least of which might be the attainment of a higher level of the scientist's own self-respect and dignity through his direct participation.

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Reference

1. P. P. McCurdy, *Chem. Eng. News* **47**, 5 (1969).