ter" phenomenon, to estimate the release. The estimate was derived by back calculations from fallout monitored in Sweden.

Greenley admits that the analysis of the Chernobyl fallout patterns pushed the program to its limits and that there are many uncertainties in the conclusions. NRC researchers accept the general thesis that about 50% of the reactor's radioactive compounds were ejected. "We are saying that is a best starting guess," says Denton. Themis Speis, who has been heading a team at NRC that has been monitoring the Chernobyl data, says estimates of the fraction of volatile radionuclides that escaped from the plant range from 20% to 60%.

Not everybody agrees, however. Richard Wilson, a physicist at Harvard who headed a study of severe nuclear accidents for the American Physical Society, argues that less than 10% of the radioiodine was emitted. He bases this on the fact that the ratio of iodine to some other radioisotopes in Sweden was surprisingly low. The mechanism by which iodine would be selectively retained in the plant is unclear, however, and Wilson's low estimate is not widely supported.

What is clear is that it will be many months before the accident is understood. And how complete the understanding will eventually be will depend critically on how much information the Soviets are prepared to release in Vienna later this summer. ■

COLIN NORMAN

AAAS Meeting Briefings:

Researchers Found Reluctant to Test Theories

Despite the emphasis placed by philosophers of science on the importance of "falsification"—the idea that one of a scientist's main concerns should be to try to find evidence that disproves rather than supports a particular hypothesis—experiments reported at the AAAS annual meeting suggest that research workers are in practice reluctant to put their pet theories to such a test.

In a paper on self-deception in science, Michael J. Mahoney of the University of California at Santa Barbara described the results of a field trial in which a group of 30 Ph.D. scientists were given 10 minutes to find the rule used to construct a sequence of three numbers, 2,4,6, by making up new sequences, inquiring whether they obeyed the same rule, and then announcing (or "publishing") what they concluded the rule to be when they felt sufficiently confident.

The results obtained by the scientists were compared to those achieved by a control group of 15 Protestant ministers. Analysis showed that the ministers conducted two to three times more experiments for every hypothesis that they put forward, were more than three times slower in "publishing" their first hypothesis, and were only about half as likely as the scientists to return to a hypothesis that had already been disconfirmed.

Mahoney added, however, that both groups rarely generated experiments that were deliberately intended to try to falsify rather than to confirm their hypotheses (the correct answer had been the rule: list any three integers in ascending order).

"In the everyday practice of science, of course, corroboration and disconfirmation are often combined," he told the AAAS meeting. "But it is somewhat disconcerting that the logically more powerful and informative process of falsification remains relatively less appreciated and practised by many scientists."

In another experiment designed to study how the conclusions of a scientific paper affected the way that the paper was evaluated by journal referees, five different versions of an article reporting results of an experiment involving the psychological behavior of children were submitted to 75 referees.

Analysis of the referees' reports showed that those versions of the paper in which the results were written up in a way that appeared to confirm traditional views in orthodox behaviorism received a considerably more positive reaction from referees than those which appeared to undercut these views.

"With identical experimental procedures, for example, a manuscript reporting positive results was rated as methodologically superior to one reporting negative results," said Mahoney. These manuscripts were also significantly more likely to receive a recommendation that they should be published

He admitted that his investigations of the factors influencing referees decisions had not been unanimously welcomed. Almost one quarter of those who had been used in the study—without being informed of the fact—subsequently expressed disapproval of the way they had been deceived into participating, and three tried to have him fired or reprimanded by the American Psychological Association.

In a subsequent experiment, in which referees were this time informed of the nature of the study, a variation in the institutional affiliation listed for authors did not appear to affect the evaluation of the scientific content of a paper. However, Mahoney said that the greater the number of self-citations—for example, to other papers listed as being "in press"—the greater the chance that the paper would be recommended for publication.

Such experimental data, said Mahoney, suggested that the content and quality of scientific knowledge was consistently constrained by cognitive, emotional, and behavioral processes. ■ DAVID DICKSON

MIT President Attacks Federal Research Priorities

The relationship between research universities and the government is once again cooling, according to Paul Gray, president of the Massachusetts Institute of Technology. After a brief recovery from the turbulent and divisive period of the late 1960's and early 1970's, he told the AAAS meeting in a plenary lecture, "there are signs all around that we—the universities and the federal government—may be in danger of drifting further apart."

One reason, he said, is a "sea change" or sharp reduction "in the number of federally-

Calvin Campbell

Paul Gray. *The universities and the federal government may be drifting apart.*

supported fellowships, traineeships, and research assistantships for graduate students in the sciences since 1969." Another is an imbalance in the proportion of the federal budget devoted to military, rather than civilian, research, which now approaches 75%. This is "cause for concern," Gray said, because it "may draw talented people, including students and faculty, away from other promising lines of inquiry." Federal policymakers need "to keep in mind that many of the benefits of university research have arisen from the opportunity for faculty to address a wide variety of fundamental questions in science and technology," he added.

University-government relations have also suffered because of a sharp decline in "real" or inflation-adjusted funds for university research facilities since the mid-1960's,