

## Radiation exposure

# US academy study attacked

Washington

THE National Academy of Sciences has stumbled into an uncomfortable controversy about the health of American soldiers exposed to radiation when they were stationed near Hiroshima and Nagasaki after the cities were destroyed by atomic bombs in 1945. Veterans have for years been locked in dispute with the Department of Defense about the long-term health effects of their service in the area.

Last July, in a study requested by the Pentagon's Defense Nuclear Agency, the academy's research arm, the National Research Council (NRC), published a report concluding that there was no evidence to support claims that the veterans had suffered from an abnormally high incidence of the bone cancer called multiple myeloma. The fact that the report was immediately criticized as perfunctory by the National Association of Atomic Veterans (NAAV) caused little surprise.

But now, Congress's Office of Technology Assessment (OTA) has joined the fray. In a rare instance of Congress demanding a review of an NRC study, OTA says the report did not have enough evidence for its conclusions.

The academy's involvement goes back several years. In 1981, the Defense Nuclear Agency asked whether a large-scale epidemiological study of multiple myeloma was warranted. An NRC panel under Harvard's Brian MacMahon concluded that the low level of radiation to which US troops were exposed — about a tenth of a rad — could not have been responsible for the incidence of cancer. But the MacMahon panel also said that an epidemiological study might be necessary if estimates of the level of radiation encountered by American troops were revised upward or if there appeared to be *prima facie* evidence that veterans were suffering in disproportionate numbers from the disease.

In the wake of the MacMahon report, the Pentagon asked NRC to find out what it could about the incidence of multiple myeloma. A panel set up to review all known cases of myeloma among the veterans identified only nine — at the bottom of a range from 9 to 29 expected statistically in the normal population. It concluded in July (see *Nature* 304, 200; 1983) that there was therefore no evidence to support claims of an abnormally high incidence among veterans.

OTA claims the NRC study has two basic flaws. The methods used to identify only nine cases of myeloma among the veterans were likely to result in an underestimate of the number who had actually contracted the disease. At the same time, NRC probably overestimated the number of cases that could have been expected if the rate of incidence was the same for veterans

as for the general population.

Veterans who had contracted multiple myeloma were tracked down through a nuclear veterans' "hot line" established by the Pentagon and through a newsletter and magazine article organized by NAAV. The hot line had received calls from nearly 50,000 people by the time of NRC's study, of whom 678 reported service at Hiroshima and Nagasaki, and seven of those reported having multiple myeloma. NAAV found 21 names of people who had served in the two cities and had the disease.

NRC whittled down the 28 possible cases to nine. Eleven were eliminated because they appeared not to have served in Nagasaki or Hiroshima and six because they, their families or doctor failed to respond to follow-up enquiries. In another two cases, review of the clinical evidence found that they had not, in fact, suffered from the disease.

This procedure, claims OTA, was most likely to produce an underestimate of the number of cases. For one thing, the Pentagon hot line had produced only 4 per cent of the estimated 20,000 veterans who had served in Hiroshima and Nagasaki. For another, nearly half of those who contract multiple myeloma die within the first year, and at least some bereaved relatives may have failed to respond to the hot line, particularly as the advertising did not refer to multiple myeloma. Moreover of the 11 cases eliminated because they appeared not to have been at Hiroshima or Nagasaki, only seven were definitely known to have been elsewhere. And the loss of six cases because of failure to respond to a follow-up letter and telephone call could have had a dramatic impact on the overall result.

Finally, says OTA, the report compared the number of cases expected over a 35-year period with the nine cases it had tracked down — but all nine had been reported within a five-year period. OTA claims the comparison was inappropriate; its own calculation estimated the number of expected cases to be much smaller. Taken overall, OTA concludes, NRC's approach was unlikely to have detected a disproportionate incidence of multiple myeloma even if it existed.

NRC has not yet responded to OTA's criticisms, but in the view of at least one congressman the council has some explaining to do. Paul Simon, the Illinois Democrat sponsoring a bill to compensate "atomic veterans", said NRC's report had "tainted" debate about the complex issues involved. The methods and boldness of the report were bad enough, he added; more troubling was that its conclusions agreed so neatly with the views of the Defense Nuclear Agency, which had long denied government responsibility for the health problems of atomic veterans. **Peter David**

## Indian science

# Research council in trouble

New Delhi

THERE are skeletons in the cupboard of India's Council of Scientific and Industrial Research (CSIR). A scrutiny by a parliamentary committee has drawn attention to several shortcomings in the functioning of India's leading industrial research organization. The committee complains in particular that very few processes developed by the CSIR laboratories have been found useful by industry.

Only recently, Prime Minister Indira Gandhi was forthright in her criticism of the laboratories on the grounds that their research projects incur substantial losses. At a meeting of directors of national laboratories, she said that these are becoming an "ever-increasing burden on the nation" and asked that if there is no hope of the situation improving, "is it not time just to close them down?"

Now the parliamentary Public Accounts Committee (PAC) has revealed what ails these laboratories. Research projects have often been taken on without adequate planning in advance. The lack of machinery, equipment and other necessary facilities has later led to the abandonment of many such projects. In the past two years, about 300 projects have been dropped, reducing the number of schemes in hand to 1,543. A further hundred are to be terminated next year.

The officials concerned in evaluating these projects display a "superficial and perfunctory" attitude, according to PAC, which says that while unproductive and unfeasible projects should normally be abandoned after one year, some of them were allowed to continue for as long as five years. A glaring example is that of a household pump research project which had to be discarded after two years of work when it was found that the same project had been undertaken by another laboratory of CSIR three years earlier.

PAC has remarked that either the processes developed by CSIR were not selected with the needs of Indian industry in mind or CSIR has been unable to inspire the confidence of potential users in the usefulness of its processes. The council referred 295 of its technical development projects, less than half of those on its books, to the National Research Development Corporation (NRDC) for industrial exploitation, of which only 15 per cent had been taken up by industry by June 1981 — and some of these were withdrawn by CSIR.

Even public sector undertakings are not making full use of the council's research output. CSIR has been complaining of an "unsympathetic attitude towards development and utilization of indigenous know-how", saying that many of its