Science in the News

Project Chariot: Two Groups of Scientists Issue "Objective" But Conflicting Reports

Two groups of scientists have turned out reports on the possible risks involved in Project Chariot, a proposal to use nuclear explosives to create an artificial harbor on the arctic coast of Alaska. The sharp contrast between the reports suggests that one or both must fall considerably short of the objectivity intended by the authors of each.

The Atomic Energy Commission published a "first summary" by its Committee on Environmental Studies for Project Chariot. This found no significant radiation hazard in the project, and suggested that none was likely to turn up during its further investigations. The committee, as required by law, was chaired by an AEC scientist. It included three other government scientists—one each from the Office of Naval Research, the Public Health Service, and the Geological Survey—plus two American radiation biologists and a Canadian zoologist. Their report was unanimous.

The contrasting report was issued by the Greater St. Louis Committee on Nuclear Information, which describes itself as "the pioneer citizens group in nuclear education." According to the committee, "CNI does not stand for or against particular policies. It presents the known facts for people to use in deciding where *they* stand on the moral and political questions of the nuclear age." For this reason the CNI report took no position on the wisdom of going ahead with the project, although the report noted a number of conclusions based on its appraisal of the facts.

Among the points made in the CNI report are the following: that the site of the proposed test is "peculiarly liable to any risk of biological damage that might result from the radioactive fallout produced by the test"; that "a conservative judgment of the amount of fallout expected from Project Chariot would require that the AEC estimates be multiplied by 10"; that "the fallout from the proposed explosion will add to the present strontium-90 levels by an amount that cannot now be estimated with any degree of precision"; and that "in the present state of knowledge about the effects of radiation, no firm prediction can be made regarding the ultimate harm that may result from the present levels of strontium-90, or from any increase that may be brought about by Project Chariot fallout." The reader is reminded that "according to the current philosophy of radiation protection, it is assumed that every increase in radiation exposure carries with it an increased risk of disease. A brief summary is provided of the objectives of the experiment, and the reader is invited to come to his own conclusion about the relative risks and gains of the project.

The report is titled, "Project Chariot: A complete report on the probable gains and risks of the AEC's Plowshare project in Alaska." The contrasting report of the AEC advisory committee is called "Bioenvironmental features of the Ogotoruk Creek area, Cape Thompson, Alaska: A first summary by the Committee on Environmental Studies for Project Chariot."

The AEC report was based on the results of 30-odd studies commissioned by the AEC to provide a basis for the AEC committee's evaluation. Other studies are under way and will be incorporated into the committee's final report, due next April. The 30-odd completed studies were made public, and also provided most of the data for the CNI report.

For the general public, the difficulty with the AEC report is that, except for stating a conclusion that radiation effects would be "negligible, undetectable, or possibly nonexistent in areas distant from the excavation," it says very little about the radiation problem. There is nothing to indicate the basis for this conclusion; nothing to indicate what is meant by the term *distant;* and nothing about the nature of the food chain in the area, which would lead to a higher absorption of strontium-90 by the population than one might expect.

AEC officials stress that this is only a preliminary report; that the Commission had scrupulously avoided telling the committee what they should say; and that the report is, in any case, a technical summary submitted to the AEC and not written with the general public in mind.

But the AEC report was made available to the general public, and therefore must be judged to some extent on the impression it leaves with the general public. And here the AEC, at the least, would appear to have shown a poor sense of its public relations problem in failing to make emphatic, in the accompanying press releases, that the report does not represent the completed findings of the research program, which is still in progress, and that, in any case, the publication of the preliminary report is not meant to imply that the AEC has made a final decision on the radiation hazards, or would make one without supplying the public with full knowledge of the basis of such a decision.

St. Louis Report

On the other hand, the CNI report is concerned with little else but the radiation hazard, although whether CNI dealt with the problem in a way best calculated to serve its stated purpose of providing the general public with "complete" information on which to evaluate the project is quite another question.

The CNI report contains two major articles. One, an analysis of the AEC's fallout estimates, concludes that the fallout (actually the AEC's estimate of the most probable amount of fallout) might be ten times greater than the AEC supposed. The article then calculates that the test "may raise the Sr^{90} levels in the fallout zone ["a swathe of sealing off the Cape Hope peninsula"] to anywhere from about 3 to 30 times their present levels." The article had earlier stated that it was also equally possible that fallout might be only

one-fifth the AEC estimate. This lower figure would make the range 1.4 to 30, but here, and in other parts of the report, the AEC figure for the most probable level is taken as the minimum level.

Using the factor of 10, the other major article makes rough estimates of the increase in strontium-90 in lichens (which accumulate strontium-90 very readily and which are the principal food of caribou) and in caribou. The report then discusses the possible increase in levels of strontium-90 in the 700 Eskimos living in the affected area, a major part of whose diet is caribou. No estimate of this increase is made, since, "although it can be predicted that fallout from the Chariot blast would increase the level of Sr^{90} in the diet of the region's Eskimos, no accurate estimate of the size of the effect can be made without additional information not yet available."

The article points out that there is not now enough information to make a judgment on whether there is any possible harm from the strontium levels involved, and suggests, therefore, a research program to supply the needed information.

The article concludes that "until the results of these studies are available, the great uncertainty about its possible effect on life is perhaps the most serious problem which stands in the way of a decision on the wisdom of setting off the Chariot explosion."

AEC officials complain that the report is neither as accurate nor as complete as the general public might suppose. They point out, for example, that the CNI assertion that the strontium-90 yield might be 10 times greater than the AEC believed likely was based on a misreading of an AEC-sponsored study. This study gave 5 percent as the most probable portion of the total radioactive yield that might get into the fallout.

Any technical errors, though, although they may prove embarrassing to CNI, do not affect the ultimate conclusions of the CNI report. The ultimate conclusion of CNI, as stated in a press release contrasting their report with the AEC's is that "the evidence, including the more extensive data cited in CNI's own report, is insufficient to support any firm conclusion regarding the safety of the project." This conclusion is not affected by the technical errors that may have crept into the report, and does not, for that matter, contradict the AEC report, which also did not reach any "firm conclusion."

The main problem with the CNI report is not with the technical soundness of the report but with the wording, and particularly the probable effect of the choice of words on the lay audience to whom the report was addressed.

CNI Conclusions

On one major conclusion CNI seems clearly misleading. The report states that "the fallout from the proposed explosion will add to the Sr^{90} levels by an *amount* which cannot now be estimated with any degree of precision" (emphasis added). This amount, of course, while difficult to predict precisely, falls within well-defined limits: it cannot be less than 0 percent nor more than 100 percent of the total strontium-90 produced by the explosion, and this latter figure can be predicted with good accuracy. But it also estimated that for the particular fallout constituent CNI was concerned with, strontium-90, the most probable figure would be 25 percent. Thus the figure could be underestimated, at most, by a factor of 4, not by the factor of 10 calculated by CNI.

Of the other two "general conclusions" cited earlier, the AEC agrees with that concerning the food chain. But the final conclusion, although accurate, could be misleading for the lay audience to whom the report is addressed. It simply says that "no firm prediction can be made regarding the ultimate harm that may result [from the test]" and that "according to the current philosophy of radiation protection, it is assumed that every increase in radiation exposure carries with it an increased risk of disease." This is perfectly true. Thus it is known that watching television exposes the viewer to small amounts of radiation, and in the words of the CNI report, "no firm prediction can be made regarding the ultimate harm," and again as the CNI report accurately points out, "it must be assumed that [this] increase in radiation exposure carries with it an increased risk of disease." As it happens, the exposure from habitual television watching, or from current levels of fallout, is roughly the same as the exposure the 700 Eskimos might receive if pessimistic assumptions about absorption of strontium-90 are correct. Although the ultimate harm cannot be firmly predicted, the National Academy of Sciences, in its widely respected report on radiation hazards, referred to the probable damage from such levels as "negligible."

A spokesman for CNI was asked whether the repeated emphasis on the difficulty of predicting the damage, if any, from such levels, along with the lack of any discussion of the range of damage within which uncertainty lies, might not mislead a general reader into thinking that the risks are much greater than any reputable scientist claims they are. The CNI spokesman said that "the idea of anyone interpreting the report in this way never crossed our minds," and that such information certainly would have been included if the committee had felt the report, as is, might mislead the public.

The CNI spokesman was asked whether the public, in evaluating the possible risks, might not have found useful some discussion of the likelihood that the damage would be great enough to be detectable. He said that an analysis of this problem would have made the report "too long," that the committee had attempted a calculation of probable damage but that it proved "too complicated," and that the committee had covered this subject, in any case, in other reports it had issued.

The CNI spokesman said he considered the report, as is, to be "a tremendous labor to give the scientist an idea of how he can function, and to give the public an idea of what the scientist can do for him."

The report (50 cents) is available from CNI, 6504 Delmar Blvd., St. Louis, Mo. The AEC report ($1) is available from the Office of Technical Services, Department of Commerce, Washington, D.C.—H.M.

The Test Ban

The general feeling is that the Administration has been handling the delicate problem of the disintegrating test-ban negotiations about as well as possible. What the Administration wanted to do, and appears to have succeeded in doing, was to make clear that the threat to resume testing was brought about by Russian intransigeance, rather than by an American desire to resume testing that outweighed our interest in reaching an agreement, or by a mere yielding to domestic political pressures.

The American "white paper" on the situation emphasized that it was the Russians who originally insisted that the test ban be separated from the