
Surviving a nuclear holocaust

Life might not be much to brag about afterwards, but the human species apparently could survive a nuclear exchange of even 10 billion tons TNT-equivalent, according to a National Academy of Sciences study issued last week. The report promises to be one of the most controversial in recent times, already drawing criticism on its relevance, methodology and the danger of "arousing the nuclear nuts" by giving a partially optimistic assessment.

Academy President Philip Handler responded to questions often put to him by young activists by adding the explicit statement that "the biosphere and the species *Homo sapiens*" would both likely survive a hypothetical nuclear war in which would be unleashed about half of the present superpowers' arsenal. He hastened to add, however, that major uncertainties still exist and that the proliferation of nuclear weapons should be halted "as soon as possible."

The report itself, the product of an intensive five-day seminar held by the Academy at the request of the U.S. Arms Control and Disarmament Agency (ACDA), concludes that no nation would be able to launch a major nuclear attack anywhere in its own hemisphere without creating a long-term ecological backlash that would severely affect its own people. Some details:

- The hypothetical 10,000-megaton exchange would cause strontium-90 fallout averaging 1 curie per square kilometer over the Northern Hemisphere (assuming that is where the war took place). The amount of nitric oxide in the atmosphere would be increased from 5 to 50 times, destroying much of the ozone layer (from 30 to 70 percent). About the same amount of dust as released in the great Krakatoa eruption of 1883 would also be injected into the atmosphere, reducing solar irradiance at the ground by a few percent and possibly lowering surface temperatures by a few tenths of a degree.

- Natural terrestrial ecosystems of nations not directly bombed would suffer "minor" disruption from increased ultraviolet radiation (because of the ozone depletion) and temperature changes.

- Crops and domesticated animals might be severely affected; if Canada and the United States were bombed, two-thirds of the grain shipped in international commerce would disappear.

- Geographic distribution of certain aquatic species might be changed.

- Humans in the Northern Hemisphere would absorb an extra 4 rem dose of radiation over two or three decades, causing an increase of about two percent in the spontaneous cancer death rate. A 50 percent depletion of the ozone shield

would result in about a 10 percent increase in skin cancer due to ultraviolet radiation. A 0.2 to 2.0 percent increase of genetic disease could be expected.

The conclusions are fraught with uncertainties. Fundamental processes of climate changes are so little understood that the possible effects of a small global temperature change cannot be predicted. The total amount of radiation dumped into the atmosphere depends greatly on how "clean" the bombs are and whether they hit a nuclear reactor. All the effects were considered independently—various interactions might increase destruction.

The major new point of the report is that the single largest threat seems to come not from radioactive fallout, as once be-

lieved, but from destruction of the ozone. Here the Academy figures seem particularly conservative. The report estimates that *at most* a 50 percent reduction of the ozone would cause a 30 percent increase in skin cancer incidence, but other reports have indicated that such an increase of cancer could result from only a 10 percent drop in ozone.

By considering only the effects of an all-out war, the report appears strangely out of date. Recent policy discussions have centered more on the possibility of limited "tactical" use of nuclear weapons by the major powers or of a geographically limited war between two small nuclear nations. The Academy study sheds no light on the possible effects of these. □

Endangered species hearings: 'Get moving'

The sparks just didn't fly. The "neoinquisition" that some conservationists hoped for, that some Interior Department officials feared and that almost everyone connected with endangered species expected, just didn't materialize at the oversight hearings of the House Subcommittee on Fisheries and Wildlife Conservation last week. But, in the opinion of several observers and hearing participants, a fire was set beneath the Interior Department's office of endangered species that should keep the activity level there near the boiling point for some time to come.

The oversight hearings were called by subcommittee chairman Robert L. Leggett (D-Calif.) to give legislators and the public the rare opportunity to scrutinize the inner workings of a bureaucratic agency. The Interior Department's endangered species program, headed by Keith Schreiner, had come under increasing criticism for its bureaucratic inertia and apparent timidity in protecting endangered plants and animals with the Endangered Species Act of 1973. But facing a legislative review of policies and practices seems to have been just the impetus needed to cut through bureaucratic barriers.

"Before the hearings were announced, there had only been 11 species placed on the endangered or threatened lists in two years, there were no critical habitats designated and no working agreements with State governments," a Government scientist and long-time observer of the endangered species program told SCIENCE NEWS. "But since the Leggett hearings were announced earlier this year, that office has proposed almost 400 species for listing, has begun action on 400,000 acres of critical habitats and has seven State-Federal agreements in the mail. Just having hearings," he said, "put the Interior in the position of doing something."

The hearings themselves, however, aside from the activity they generated, were cordial and notably lacking in the pointed questions and verbal assault many expected. "To put it bluntly," the source

said, "Keith Schreiner and the endangered species office people were handled with kid gloves. The Congressmen could easily have raked them over the coals, but they were let off easy. At least until the next oversight hearing."

Not all forward movement was generated indirectly, however, according to subcommittee counsel Skip Spensley. Amendments were proposed that would align portions of the Endangered Species Act and the Marine Mammals Protection Act. He says the committee will take a hard look at Interior's system for choosing which species to protect first, at the time periods required for listing species and at the declared needs for more money and manpower.

The greatest potential for forward movement, however, the things most likely to keep the formerly sluggish endangered species program at a rolling boil, were the promises. During questioning by Congressmen, Schreiner and other Interior Department officials promised rapid completion of several pending actions and promised to begin others—actions that would help close the gap between the 25,000 or so species slated for review and the 25 or so species so far reviewed and listed. Leggett has called another oversight hearing in three months to check up on precisely those promises.

One observer summed up the hearings this way: "These were the first major oversight hearings since the Act was amended in 1973. Rumor has it that Schreiner had five people working full time for several weeks preparing briefs and testimony for these hearings. There had to be a lot of rethinking and internal organization during those weeks. There was, quite frankly, a 'Get Schreiner' campaign going on until quite recently. I think now you could call it a 'Get Schreiner moving' campaign. He and his office have really gone on record with promises for the near future," he said. "And if they aren't fulfilled, I think there will be sparks at the next hearing." □