Even more warnings

CONSTANCE HOLDEN

First it was physicians telling the world that, in the event of a nuclear attack, there could be no adequate medical care for survivors. Now biologists and atmospheric physicists, bolstered by new calculations, say the the ecosystem itself would be gravely and permanently damaged by a full-scale nuclear war.

The findings were presented at a 2-day conference, "The World After Nuclear War," held in Washington at the end of October. The central figures were Cornell astronomer Carl Sagan and biologist Paul Ehrlich of Stanford.

Although policy questions were carefully avoided, there were at least two implications. One was that a single nuclear counterforce strike, even if unilateral, would be suicidal to the nation launching it. The other was that no one in the world would be unaffected by such an event. Some Third World nations would be compelled to abandon the idea that it would not be all bad to have the two great powers finish each other off.

Sagan, describing climatological effects, said things would be a lot worse than indicated by any prior calculations, including a 1975 report by the National Academy of Sciences. He and his colleagues, in a paper know as TTAPS* evaluated numerous scenarios of attacks ranging from 100 megatons (the equivalent of 8000 Hiroshimas) to 10,000 megatons. In the 5,000 megatons case - approximately that required for a preemptive counterforce strike - they predicted that clouds of dust would create a ball of darkness with sunlight about 5 percent of normal in the mid-latitudes of the Northern Hemisphere. Tempertatures would drop precipitously to as low as -23°C and remain subfreezing for months. Radioactivity would be more lethal than previously estimated, with up to 250 rads - half the human lethal dose - covering 30 percent of the area. The atmosphere would be further polluted by poisonous fumes emanating from urban fires. Depletion of ozone by oxides of nitrogen would raise the level of ultraviolet radiation, damaging immune systems and causing blindness.

One of the major findings was that effects would not be confined to the Northern Hemisphere. Disturbances in global circulation patterns would result in the interhemispheric transport of hundreds of tons of nuclear debris, resulting in light and temperature reductions as well as radioactive fallout in the Southern Hemisphere as well.

*Named after the authors: R.P Turco of Marina Del Ray, California; O.B. Toon, T.P. Ackerman, and J. B. Pollack of NASA Ames Research Center; and Sagan. The paper will soon be published in Science along with a 20-author paper on the biological consequences.