lished report of the properties of silk in this regard was in 1887 by George E. Goodfellow, renowned surgeon, expert on gunshot wounds, and citizen of Tombstone, Arizona Territory (*1*). He wrote, "A somewhat extensive experience in the gunshot wounds of civil life, during the past few years, has brought to my attention the following instances illustrative of the remarkable tenacity of silk fibre and its resistance to the penetrative power of a bullet." The paper then describes three instances of Chinese silk handkerchiefs impeding the progress of bullets through the bodies of the wearers.

In the first case, occurring in the spring of 1881, the doctor observed a lethal quarrel from a distance of "a few feet." The first shot fired struck one of the men in the left breast. "The ball came from a cut-off Colt 45-calibre revolver, fired at a distance of six feet, the cartridge of which contains thirty grains of powder and two hundred and sixty grains of lead." An examination of the wound by Goodfellow showed that a silk handkerchief worn in the coat pocket was protruding from the entrance wound. When pulled from the wound, the bullet was found lying in the folds of the silk with two thicknesses of silk covering the bullet. Subsequent experiments using identical loads and a 4-inch-thick pine board demonstrated that the bullet should easily have passed through the victim's body. Goodfellow then detailed even more remarkable cases to demonstrate the unusual properties that we now know characterize silk fibers in general.

Joel M. Harp
University of Tennessee and
Oak Ridge National Laboratory,
Oak Ridge, TN 37831–8077, USA
E-mail: harp@bioax1.bio.ornl.gov

References

1. G. E. Goodfellow, "Notes on the Impenetrability of Silk to Bullets," *Southern California Practitioner, II*, 95 (March, 1887).

■

Climate Change and Consensus

I attended the recent Madrid and Rome meetings of the United Nations–sponsored Intergovernmental Panel on Climate Change (IPCC) on behalf of The Science & Environmental Policy Project, a nonprofit, nonpartisan research group. We wanted to document how the nearly 200 governmental delegates from some 120 nations went about fashioning a summary from an underlying scientific report prepared by mainly Western academic scientists. The impression I gained is rather different from the one projected by Richard A. Kerr ("It's official: First glimmer of greenhouse warming seen," News, 8 Dec., p. 1565).

The IPCC summary report (*1*) presents selected facts and omits important information:

- The summary (correctly) reports that climate has warmed by 0.3° to 0.6°C in the last 100 years, but does not mention that there has been little warming if any (depending on whose compilation is used) in the last 50 years, during which time some 80% of greenhouse gases were added to the atmosphere. The summary does not mention that the satellite data—the only truly global measurements, available since 1979—show no warming at all, but actually a slight cooling, although this is compatible with a zero trend.

This negative result from the real atmosphere should be compared with what climate models predict: A "best" warming rate of 0.3°C per decade, according to IPCC's 1992 summary—newly reduced to 0.2°C per decade in the 1995 summary. With climate models lacking validation, why then should we trust any of the forecasts about future warming, sea level rise, and other claimed impacts—or use them as the basis for costly policies?

• The IPCC summary does not mention explicitly that—thanks to the inclusion of previously neglected aerosols in global circulation models (GCMs)—its 1995 temperature forecasts are one-third less than the range of values endorsed just 3 years ago. Yet statesmen signing a Global Climate Treaty in Rio, including George Bush, were assured that the IPCC forecasts represented a "scientific consensus" and were "of the highest quality."

• The cooling effects of aerosols have been well recognized for some 30 years and have been invoked by climate scientists, such as Murray Mitchell and Reid Bryson, to explain the climate cooling observed between 1940 and 1975. Yet aerosols were incorporated into GCMs only recently—and only imperfectly. Man-made aerosols encompass a wide variety of particulates—sulfates from the emission of SO_2 in fossil fuel combustion to smoke and soot from forest clearing and other biomass burning. Because these have quite different optical properties, their climate effects will also be quite different.

GCMs consider only the "direct" effects that involve scattering of solar radiation and thus an increase in albedo. It is generally acknowledged, however, that the indirect effects, involving the nucleation of cloud droplets, are more important and far-reaching. Unfortunately, these are also difficult to model reliably. To the extent that pollution control by major emitting nations is reducing the creation of sulfate aerosols, one would expect the *current* average warming rate to be greater than 0.3°C per decade, and one would expect to see enhanced regional differences, making the disagreement with observations even greater.

In view of the above, it is difficult to give credence to the statement that "over recent decades the observed spatial pattern of temperature change *increasingly* resembles the expected greenhouse-aerosol pattern" (*1*) (emphasis added). The research has not yet, to my knowledge, appeared in the peer-reviewed literature, violating a major rule of the IPCC. More important, there has not been time for an independent scrutiny to see, for example, whether the resemblance really "increases," irrespective of the GCM and aerosol scenario that are used.

• The summary does not make it explicit that the IPCC time scale for warming has now been stretched out—doubled, in fact, from 2050 to 2100—making any possible impact less dramatic. The summary also does not mention an authoritative U.S. government statement; it quotes a global warming as low as 0.5°C by 2100—only half of the IPCC's lowest 1995 prediction. Such a low value, while barely compatible with current observations, would be inconsequential and even difficult to detect in view of the large natural fluctuations of the climate. Global warming would become a nonproblem. The mystery is why some insist on making it into a problem, a crisis, or a catastrophe—"the greatest global challenge facing mankind" (*1*).

S. Fred Singer
Science & Environmental Policy Project,
4084 University Drive, Suite 101,
Fairfax, VA 22030, USA

References

1. "Working Group I report of the IPCC," available from Bruce Callander, bacallander@email.meto.govt.uk

■

Oxidative Stress and Apoptosis in HIV Infection

Jon Cohen's article of 25 August ("Researchers air alternative views on how HIV kills cells," p. 1044) summarizes a recent discussion of AIDS researchers about "Alternative models of HIV pathogenesis." CD4-gp120 interaction, leading to T cell death by apoptosis, is likely to play a major part in the final deterioration of the immune system in AIDS. In this context, we would like to draw attention to the role of reactive oxygen intermediates (ROI's) and neopterin-derivatives. HIV infection is associated with an increased production of cytokines, ROI's, and neopterin-derivatives. Increased neopterin is correlated with the selective loss of the MHC self-restricted $CD4^+$ T cell functional response and of $CD4^+$ T cells in patients with HIV-1 infection (*1*), and neopterin concentrations predict rapid disease progression (*2*). Likewise evidence is accumulating that processes of programmed cell death and latent virus activation may be linked to "oxidative stress" in HIV infection (*3*).

Recent data demonstrate a potential role of neopterin and 7,8-dihydroneopterin in oxygen free–radical-mediated processes. We have shown that 7,8-dihydroneopterin may superinduce tumor necrosis factor (TNF)–α–mediated programmed cell death, accompanied by an increased formation of ROI's (*4*). On the basis of these observations, we propose that neopterin and 7,8-dihydroneopterin, excreted in close correlation (*2*), are likely to join the line of agents and cytokines such as interferon-γ and TNF-α that rule over the fate of cells in HIV infection. Continuous activation of T lymphocytes may lead, along with several other mechanisms, to the build-up of an autokrine loop and finally to the exhaustion of the immune system (*5*).

Gabriele Baier-Bitterlich
Helmut Wachter
Dietmar Fuchs
Institute for Medical Chemistry and Biochemistry,