Stage set for curbing global warming gases

Representatives of more than 140 nations last week raised the ante in ongoing negotiations aimed at battling greenhouse warming. Spurred by a new, aggressive U.S. stance, delegates in Geneva called for adopting legally binding limits on greenhouse gas pollution by the end of next year.

The United States previously withheld support for setting obligatory restrictions on emissions, preferring instead soft targets such as those built into the climate convention signed in Rio de Janeiro in 1992. In that agreement, industrialized countries pledged to cut back their emissions of greenhouse gases, with the goal of returning to 1990 levels by the year 2000. Few nations, however, are on track to meet that target.

Timothy E. Wirth, U.S. Undersecretary of State for Global Affairs, surprised delegates assembled in Geneva with a call for strict limits on emissions. "We are convinced that the target must be both realistic and binding because it is only through the surety of a commitment of this nature that governments will take their obligations seriously and the only way we can be assured of progress," he told negotiators.

"The U.S. statement was a political turning point in the conference," says Michael Zammit Cutajar, the United Nations' Executive Secretary of the Climate Convention in Geneva.

In the past, European nations have raced ahead of the United States in supporting strict limits. With the U.S. turnabout, representatives at the Geneva meeting issued a declaration calling for accelerated negotiations on a legally binding agreement to be signed at a conference in Kyoto in December 1997.

"This is quite a step forward," says Zammit Cutajar.

Wirth strongly supported the scientific conclusions of the Intergovernmental Panel on Climate Change, which found last year that humans are now altering climate in identifiable ways. The new Geneva declaration also endorsed the IPCC report, which has received some criticism (SN: 7/6/96, p. 15).

A long road still lies ahead of the negotiators. Although nations have agreed that the Rio target is inadequate, there is no consensus on how deep the emissions cuts must go.

Even the nonspecific Geneva declaration drew criticism from some nations. Australia and New Zealand expressed reservations about setting firm requirements. Russia and some other oil-producing countries objected to using the IPCC's conclusions as a basis for urgent action.

— R. Monastersky

Bible-era grain sows seeds of contention

Joshua ordered a trumpet blast, and the walls of Jericho came tumbling down, ending the Israelites' 40-year sojourn in the desert, the Bible says. Some archaeologists, however, hold that ancient Egyptian armies were responsible for sacking Jericho sometime between 1550 and 1300 B.C.

A pair of Dutch researchers now claims that cereal grains from Tell es-Sultan, the site of ancient Jericho, can provide an accurate date for the siege.

The handful of blackened grains comes from a layer at the site scorched by fire, marking the destruction of Jericho. Radiocarbon testing indicates that the seeds are 3,311 years old—give or take 13 years—report Hendrik J. Bruins of the Ben-Gurion University of the Negev in Israel and Johannes van der Plicht of the University of Groningen in the Netherlands in the July 18 NATURE. Although scientists cannot convert age in radiocarbon years directly to a calendar date, the researchers estimate that the Jericho layer containing the grains dates to around 1580 B.C.

They note the closeness of the grains' age to a radiocarbon age of 3,356 years for a huge volcanic eruption on the Aegean island of Thera. Scientists have linked that blast, which devastated Crete and blanketed the southeast Mediterranean with ash, to a plague described in the Bible as "darkness that can be felt" and to Egyptian accounts of dark skies at the same time. Researchers have determined the calendar date of the eruption as 1628 B.C.

The difference of 45 years between the radiocarbon age of the grains and the eruption is "rather striking," Bruins and van der Plicht note. Moreover, the dates fit neatly with the biblical account, in which the exodus of the Jews from Egypt begins with plagues and ends 40 years later with the destruction of Jericho.

Radiocarbon dating is more art than science, says Cornell University archaeologist Maryanne Newton, who suggests that the 45-year interval seized on by the scientists rests on "a string of assumptions." The 13-year margin of error surrounding the Jericho date is a standard number referring to laboratory error, so the team's estimate could actually be off by a wider margin, she adds.

Bruins is now seeking to improve the correlation by comparing the radiocarbon age of the grains to more accurate tree-ring data (SN: 6/29/96, p. 405). This "may lead to truly absolute dating," he says.

— E. Skindrud

Hip fracture risks go beyond bone loss

To guard against debilitating hip fractures, the sixth leading cause of death in persons over age 65, physicians routinely encourage older women to consume plenty of bone-strengthening calcium. A new study of French women, however, suggests that other impairments pose fracture risks equal to that of postmenopausal bone fragility.

Four centers run by INSERM, the French national medical research agency, recruited women at least 75 years old for a series of tests that measured not only the density of hip bones but also other factors that can affect vulnerability to falls—such as vision, balance, and leg strength.

Over the next 2 years, 154 of the 7,575 volunteers in the study suffered first-time hip fractures. For that group, a set of four vulnerability factors proved as reliable at predicting hip fractures as bone density, currently the gold standard of fracture risk. The factors—poor vision, slow gait, difficulty performing a tandem walk (where the heel of one foot is placed immediately in front of the toe of the other), and small calf circumference (a gauge of leg muscle)—were reported in the July 20 LANCET.

In a given year, 1.1 percent of women who had either thin hip bones or this quartet of vulnerability factors could be expected to develop a fall-related fracture, points out lead author Patricia Dargent-Molina of INSERM in Villejuif. Her study found that 2.8 percent of those with both types of risk factors could be expected to fracture a hip—more than five times the incidence in women with neither thin bones nor a high fall-vulnerability profile.

The likelihood of falling is much greater "if you have reduced neuromuscular capacity," observes Jan Lexell of Lund (Sweden) University Hospital. Now, he says, science must identify the source of such impairments—whether it is loss of muscle, of the nerves that trigger muscular action, or both.

Dargent-Molina notes that her new findings "suggest ways to prevent fractures that don't rely on drugs that act on bone."

Mary E. Tinetti of Yale University has investigated strategies to cut the risk of falls in the elderly. By looking at a combination of factors, she says, the new French study provides a focus for designing cost-effective exercise and behavioral modification programs.

Tinetti cautions, however, that since the French don't fortify foods with vitamin D, which is important to bone and muscle health, women in INSERM's study may face higher fracture risks than most U.S. women.

— J. Raloff