These microanalyses confirmed that dust particles suggestive of comet dust in appearance also resemble comet dust chemically. The 45% of the particles studied that look the way comet dust is expected to—they are highly porous, laced with an organic tar, and composed of submicrometer mineral grains—have a distribution of compositions that rules out chemical alteration by liquid water. That is consistent with the porous dust being cometary because comets are thought to have been frozen since their formation; the most primitive meteorites, the carbonaceous chondrites, clearly had their original minerals altered by water. The 37% of dust particles that are smooth and nonporous, on the other hand, show clear evidence of alteration by liquid water, just as carbonaceous chondrites do. "It is likely," the group concludes, that the porous particles are cometary and the smooth ones asteroidal.

That conclusion was strengthened by studies of the composition of Halley dust particles as determined by instruments on the Soviet Vega and European Giotto spacecraft that flew through Halley's dust. In the most recent study, Mark Lawler, Brownlee, Scott Temple, who are all at Washington, and Wheelock selected only the highest quality data from the instruments, which identified the elemental ions created when individual dust particles slammed into the spacecraft at 250,000 kilometers per hour.

Looking at the proportions of magnesium, silicon, and iron in about 500 particles, the group concluded that it has "good evidence that Halley is not composed of aqueous alteration material," according to Brownlee. "You can show that Halley is unlike the carbonaceous chondrites, even though the average bulk composition is similar. Halley is more akin to [porous interplanetary dust] particles. They are the best match that we have for Halley."

As confidence grows in the laboratory, more attention might be given to determining which specific objects are being sampled. For example, asteroidal dust collected in Earth's atmosphere may broaden the range of asteroids sampled by the 10,000 meteorites now in hand. They are probably supplied by the few dozen asteroids from which Jupiter's gravity can send objects toward Earth. When compared with the 10,000 meteorites, 85% of interplanetary dust particles, the large majority of asteroids, and Halley dust most closely resemble two classes of carbonaceous chondrites that constitute only 3% of meteorite falls. Wherever asteroidal interplanetary dust comes from, it seems to be more representative of the asteroids than all the known meteorites.

■ RICHARD A. KERR

U.N. Considers Biodiversity Convention

Concerned that existing international laws are not sufficient to halt the rapid disappearance of many of the world's species, the United Nations Environment Programme (UNEP) has taken the first step, in what is usually a 10-year process, to draft a new global convention for the conservation of biological diversity.

The proposal is likely to be controversial, as several other global conventions already address biodiversity, and few countries want to add another layer of international bureaucracy or to support another secretariat.

The problem with the existing instruments, according to an ad hoc experts panel that met at UNEP in Nairobi, Kenya, in early September, is that they provide at best only patchwork coverage of biodiversity; thus the need for a new "umbrella" convention to fill in the gaps. No one is thinking of another "motherhood" convention, says Kenton Miller of World Resources Institute, who was on the panel, but rather one with a funding mechanism that can be used for training or for establishing reserves, among other things.

However, getting nations to kick in a substantial share to international agreements has proved difficult in the past. The United States, for one, is notably behind on its payments to all the global conventions and to the United Nations, though the latter is at last being at least partially addressed.

The reason an umbrella convention is needed, says panel member Peter Raven of the Missouri Botanical Garden, is that each of the existing conventions protects only a very small percentage of global biological diversity, and each is signed by a different set of nations. And most of these conventions, like those to protect world cultural and natural heritage, migratory species, and endangered species, were established for other purposes and protect biodiversity as a by-product.

Moreover, while these global and regional conventions add prestige and underscore the importance of certain areas, they do not add much in terms of real estate, or new land, since many of the sites they designate are already protected by national laws. Says WRI's Miller: "The vast majority of sites considered critical for the conservation of biological diversity are not covered by any international agreement."

Perhaps the key element of the convention, as now envisioned, is a funding mechanism to support conservation efforts in countries that could not afford them otherwise. The nations with the greatest diversity are often least equipped to deal with it, financially and technically.

The tricky question, obviously, is where money for the fund will come from. One possibility is voluntary contributions by governments, another is a tax on the use of genetic resources.

As described in the expert panel's draft report, which is just the first of many versions, the convention would also establish a technical committee that would maintain a world list of areas particularly important for biodiversity.

This same technical committee would review grant applications to the fund, which would be used, for instance, for establishing new sites or improving existing ones, for example, as Dan Janzen is doing through restoration ecology in Costa Rica. The fund would also provide long-term financial support, where needed, to the international research and training centers, such as those in Serengeti and the Galápagos Islands.

How well any of this works depends, of course, on how much money there is. Sentiment was strong at the meeting, according to Miller, that "unless there is a firm commitment from governments for a serious funding mechanism, there would be little value to negotiating and launching this global instrument." Miller adds: "We are talking about real money, millions and millions of dollars a year." But those commitments can be hard to extract and harder still to enforce, as the U.S. example makes clear.

The panel, assembled at the behest of UNEP's governing council to advise UNEP on the adequacy of existing conventions and ways to "rationalize" them, included Miller, Raven, Thomas Lovejoy, and Michael Soulé from the United States, and Jeffrey McNealy and Martin Holgate of the International Union for the Conservation of Nature and Natural Resources (IUCN), Reuben Olembo of UNEP, Perez Olindo of Kenya, and David Munro of Canada.

The next step is a meeting of government experts this November in Switzerland. That panel will review the biologists' report and advise UNEP on how it might be shaped into a politically acceptable convention. In the spring Mostafa Tolba, UNEP's executive director, will return to UNEP's governing council with his recommendation. Meanwhile, IUCN is already working on a draft of the convention, incorporating ideas from the Nairobi meeting.

■ LESLIE ROBERTS