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Ten Years After Stockholm

In 1972 the Stockholm Conference on the Human Environment marked a peak of public concern for the maintenance of environmental quality. One of its outcomes, the United Nations Environment Programme (UNEP), is celebrating the 10th anniversary of the conference with a "session of special character" on 10 to 18 May in Nairobi, where national and nongovernmental representatives will review events of the decade and lessons to be drawn from them. What can be said of significance for the scientific community?

It is relatively easy to rack up the scores on the legal and administrative measures taken in response to the Stockholm Conference recommendations. UNEP provides a succinct account of treaties ratified or not ratified, agencies established, programs initiated, and meetings convened in large number.

It is extremely hard to appraise what, in fact, has happened to the principal components of the environment—the atmosphere, marine environment, inland waters, lithosphere, terrestrial biota, and people. The evidence as reported by UNEP is ragged. The trends that can be discerned with confidence show good news and bad news, and I note a few of each.

Compared with the situation in 1972, the rate of annual population growth in 1980 was diminishing on all continents except Africa. The quality of air in many high-income cities was improving. Likewise, contaminant loads in the inland waters of industrialized countries were generally decreasing. Significant advances were made in reclamation of surface-mined lands and in establishing reserves for the preservation of terrestrial biota.

On the negative side, urban air quality in low-income countries continued to decline. The pollution of certain sectors of coastal waters increased, although the marine production in large sectors grew slightly or leveled off. Deterioration of many semiarid lands and of some irrigated soils expanded. Moist tropical forests were being reduced, but there was a wide divergence among the estimates concerning rates and extent. The implications of increasingly massive alterations in the global cycling of carbon, sulfur, and nitrogen were only beginning to receive integrated analysis.

The assembled data on these and numerous other trends not mentioned here should be critically appraised. While they will no doubt be interpreted in different ways, at least three observations deserve the immediate attention of the scientific community.

First, as revealed by the difficulty in measuring changes, a more coherent effort needs to be made to monitor key parameters. The expectations of many at Stockholm that an efficient global earthwatch program would soon be put into place proved sanguine. The present deliberate effort should be streamlined and its pace should be accelerated.

Second, it is becoming evident that appraisals of all but a few basic changes such as those in atmospheric carbon dioxide or ozone are most meaningful on a regional basis, where the intertwining of biological, physical, and social factors can be examined in context. Promising advances, for example, have been made in looking at regional seas rather than at the oceans as a whole.

Third, the scientific grounds for measures to correct much of the degradation in soil, water, biota, and air are well known, but there needs to be more systematic analysis of ways of overcoming social and political obstacles to undertaking them. While speculation runs high on questions of long-term climate change, the quiet degradation of biotic and soil resources proceeds.

The decade after Stockholm has shown that environmental improvement can be achieved, that the pace is slow in many areas, and that scientific inquiry can help speed it up.—GILBERT F. WHITE, *Gustavson Professor Emeritus of Geography, Institute of Behavioral Science, University of Colorado, Boulder 80309*