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For Full Technological Assessment

In 1966 Allen Astin, Isadore Perlman, and I were asked to visit Czechoslovakia to complete arrangements between our own National Academy of Sciences and the Czechoslovakian Academy of Sciences for an exchange of scientists between the two countries. We were most hospitably received and were taken to visit the many institutes under the aegis of the Czechoslovakian and Slovakian academies. In Bratislava I came upon one with the intriguing name, "The Institute for the Study of the Biological Landscape." I inquired about the meaning of this title and the objectives of the Institute and was told a tale of considerable interest.

At the close of World War II, the economic planners decided that a large aluminum processing plant was to be located somewhere in Slovakia. Military authorities strongly preferred a site in one of the narrow valleys of the Lower or Middle Tatra. Some scientists demurred on the ground that the smelter fumes would cause damage, but they had no hard facts to present, and the plant was constructed in the valley. At that time, the available fuel was the local coal, high in sulfur content. Within a few months, it became evident that the valley had a typical atmospheric inversion layer that trapped fumes in the valley. As the sulfur dioxide content of the air increased, all plants were killed, and all animals that were not killed were driven away. The mill workers had to live at a considerable distance, and at times—so I was told—they even had to wear gas masks in order to continue work. The result was an almost total industrial disaster that might have been foreseen. Hence arose the belated recognition of the need to study the "biological landscape."

This is only one example, on a limited scale, of the destruction that man today is visiting upon his environment. Many other examples were related at a conference held in December 1968 on the ecological aspects of international development, a brief report of which has been published.* Particularly glaring consequences of lack of foresight followed the completion of Aswan High Dam on the Nile. Clearly not included in the reckoning was the catastrophic effect upon the sardine fisheries of the eastern Mediterranean. Another effect of the Aswan Dam has been the rapid spread through the Egyptian population of infestation with parasitic blood flukes, or schistosomes, whose intermediate hosts are snails. The snails, of course, spread through the irrigation canals. Finally, there is the matter of the very brief life of the reservoirs impounding the irrigation waters. When a river carries a heavy burden of silt—like the Nile or the Colorado or nearly all rivers in arid lands—the reservoir is filled with mud very quickly. What is to happen to the irrigation when the reservoir is filled?

Whether it be Nile or Colorado or Mekong, every river system presents unique features. Each is a local system that is itself part of a wider system of interacting regions and successive times.

These issues, multiplied by hundreds for the sum of our technological alterations of the natural terrestrial environment, explain why environmental scientists today speak with louder insistence of the need for a new approach to technological assessment. No piecemeal, limited approach can suffice. The biological, psychological, and sociocultural aspects, as well as the engineering and physicochemical aspects, must be introduced into the full analysis, and long-range economic aspects cannot be ignored in the prospect of immediate gain.—BENTLEY GLASS, *State University of New York at Stony Brook*

* H. Henkin, *Environment* **11** (No. 1), 28 to 35, 48 (1969).