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A KILLING RAIN: THE GLOBAL THREAT OF ACID PRECIPITATION

By THOMAS PAWLICK.

San Francisco: Sierra Club Books. 1984. Pp. 206.

In his book *A Killing Rain*, the experienced journalist Thomas Pawlick examines the chemical, biological, socio-economic, and political aspects of "acid rain" for a lay audience. Using the time-tested journalistic techniques of over-simplification and broad generalization supported by poignant anecdotal testimony, Pawlick begins by surveying the "source" (stack emissions of sulfur and nitrogen oxides), and then travels downwind for a series of agonizing vignettes of victimized aquatic and forest ecosystems. Following that, he examines the direct and indirect human costs, explores some technological options for curtailing the emissions, and concludes the book with an overall indictment of the "Hard energy path."

Throughout, the author's approach is polemical, his intent being to galvanize the citizenry for the costly imminent crusade against industrial infidels. Perhaps, as a consequence, the book contains numerous distortions of scientific and technological fact, and lapses into sensationalism. Thus, sulfur and nitrogen oxide emissions "metamorphose" in the atmosphere, "taking on new forms—more dangerous forms" (p. 7) when in fact the precursors are more toxic agents than the very dilute sulfuric and nitric acids formed from them. Later (p. 9), severe chemical properties are attributed to sulfuric and nitric acids, properties that are true *only* of the highly concentrated acids (before dilution in water). Indeed, the diluted acids can act as essential plant nutrients and soil conditioners in many (but not all) environments. Also, Pawlick understates the natural acidity in remote, non-industrialized, humid regions (p. 10), and misrepresents time trends with (p. 11): ". . . but the evidence that is available shows an undeniable and an increasingly rapid change in the acidity of precipitation in the northern hemisphere." The latter statement, which is meant to stampede the public, is at variance with recent (post 1972) trends. Unfortunately, by hastily indicting acids while giving comparatively slight attention to other atmospheric pollutants, especially ozone, Pawlick ignores complexities of the problem which require more thorough and objective analysis before *cost-effective* abatement strategies can be recommended in the political arena.

On the positive ledger, Pawlick does discuss several abatement technologies including coal washing, shifting to abundant low-sulfur western coal, installation of stack scrubbers, fluidized bed combustion, and re-

covery of by-product sulfuric acid from base metal smelting plants. This section is informative, and would seem to offer viable solutions. He often discusses complex chemical processes in highly readable prose. At times, although not often enough, he recants from his original stalwart position and admits uncertainty.

For most readers of *Natural Resources Journal* the book will be disappointing. Natural scientists may be repelled by the exaggerations, and the skirting of scientific uncertainty still clouding the issue. Social scientists will be offended by the short shrift given to the host of difficult political-economic trade-offs inherent in the "problem." Legal scholars and lawyers will find only cursory treatment of any of the interesting national and international legal issues, and will need to examine works cited in the appendix. Because of the polemical style of the book, even well-informed citizen activists cannot use it as an objective information source. But the lay public will find that Pawlick has written a stimulating book about a suite of serious environmental problems stemming from air pollution but related only in part to the acidity in the "killing" rain.

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