

*Man, A Geomorphological Agent: An Introduction to Anthropic Geomorphology.* Dov Nir, Jerusalem: Keter Publishing House and D. Reidell Publishing Co., 1983.

Reviewer: *Jonathan B. Laronne*

This text is a welcome addition to the author's much-referenced previous books. Dov Nir describes in a very readable and educational text the disparity between past and present rates of morphological change caused by the erosion and deposition induced by humans.

The extent of the impact of humans is apparent by the actual change of original topography during urban construction, forest clearing, mining, river straightening, and other activities. It is manifested by 179,000 million tons of sediment annually eroded because of human activities. This mass is equivalent to one hundred annual Yellow River sediment discharges, twenty-four times the annual sediment yield of the sixteen major sediment-producing rivers of the world, or tenfold the global annual mass of suspended sediment discharged into the oceans!

The book has nine chapters, preceded by an introduction and followed by a short appendix, an account of the influence of warfare. The introduction includes a fascinating historic overview and introduces the reader to equilibrium concepts in geomorphology. The chapters are organized according to human activity: forestry, grazing, agriculture, mining, transportation, river and shore management, settlement, and a conclusion leading to a summary of all activities.

The chapter devoted to forest clearing includes all the important environmental facets of forestry, primarily erosion, but does not deal with non-salinity-related water quality changes. The following chapter, "Pasture and Grazing," incorporates the main effects of grazing but is too short in relation to Nir's estimate that one-third of the global mass of anthropic erosion is attributable to grazing.

Chapter 3 concerns the geomorphology of agriculture and dwells more on historic and modern techniques to reduce soil loss than does any other part of the book. In this respect the chapter is more technical than others, though still highly readable. Nir is commendable for his approach that incorporates for the first time in one volume many statistics on the impact of humans upon the landscape. The chapter on agriculture, however, would have been completely gratifying had it also included tabulated soil-loss data; after all, almost two-thirds of anthropic erosion is shown to be caused by tillage!

The chapter on mining is succinct and demonstrates that geomorphic effects may also arise due to subsurface activity. Chapter 5, "Means of Transportation," deals with roads and highways, railways, bridges, airfields, waterways, and pipelines; it considers activities, though unequally so, in greater detail than any other chapter. Unfortunately, erosion of bridge piers is hardly discussed, and more space is allotted to the subject of canals through isthmuses than to the erosion of canal banks, the latter recognized as of considerably greater concern.

Riverbed and floodplain management are very well depicted in the sixth chapter. No mention is made of riverbed degradation below dams. Chapter 7, "Shore Management," demonstrates that our coasts have been tampered with by our building seawalls and groynes, stabilizing coastal dunes, mining shingle and sand, building harbors, and reclaiming land from the sea. "The Geomorphology of Settlement," chapter 8, is also an explicit description of the impact of humans upon the landscape—in this case during three stages of urban construction and renewal.

Each chapter demonstrates the type and extent of change inflicted upon landforms by people's doings. The changes are dramatically summarized in the concluding chapter, where calculations are made of the erosion caused by the separate activities. The chapter closes with presentation of an index of potential anthropic geomorphology, shown to vary with physical (climate and relief) and cultural (urban population and illiteracy-level) factors.

There are only minor typographical and other errors. The photographs are very illustrative of points being made, but they would have been more so had they been reproduced on high-quality paper. The line drawings are not entirely legible. However, Nir has offered a wide variety of figures that are helpful to the text.

The book includes a fairly representative sample of the available publications on anthropic effects, but it is somewhat short on the engineering literature. The reference list has a few unnecessary mistakes (e.g. it is Leopold, Wolman, and Miller, 1964, in sequence), does not list the publishers of books, and uses abbreviations known but to few readers (e.g. IEJ stands for *Israel Exploration Journal*).

In *Man, A Geomorphological Agent* there are many hours of interesting reading at the introductory level. At the volume's rather low hardcover price, it is a bargain, particularly to the planner.