changes, coupled with the heavy demand for selected species, foreshadow precipitous declines in the numbers of such animals as the beaver. Cronon attaches considerable importance to the use of place names to demonstrate species populations (Beaver Brook, Beaver Pond). He perhaps places too much significance on names that could actually have been applied more recently. Species decline or extirpation eventually forced the Indians to fall back on the land as their last resource.

A fascination for the New England forest attracts Cronon as it has so many scholars before him. The forest is laid before us as an ecological phenomenon, as a source of commercial wealth, and as a thicket to burn. Cronon believes that the wholesale destruction of the forest has led to increased runoff, soil erosion, stream sedimentation, and microclimatic changes. The result of two centuries of Indian decline and European ascension is the creation of "a new world of fields and fences." Land use decisions are now made by individual farmers and landowners rather than by tribe or community. The land has (at least temporarily) been tamed and converted to an "ecological cornucopia."

There is very little new factual information in this book, but tid-bits here and there will be new to some readers. For example, I knew nothing about how New England Indians had named their months, nor did I know that the Pilgrims had uncovered in 1620 the corpse of a European sailor buried on Cape Cod. The "newness" of *Changes in the Land* lies in its ideas and the new relationships suggested between already well-known components, natural and human, of the New England landscape. And one must assuredly add the newness of many of Cronon's citations from original sources, one of the book's bonuses.

Academicians in particular will be attracted to the rich supply of supporting material in the footnotes, 36 pages of references drawn from contemporary accounts, history, biology (ecology), anthropology, and to a very small extent, geography. We are given a further bonus in a long (29-page) *Bibliographical Essay* in which Cronon systematically and thoroughly arranges his references into useful categories, including Primary Documents, Ecological Literature, Ecological and Economic Anthropology, The New England Indians, and The Colonist. Only five full-blooded geographers (two deceased) appear in this extraordinary appendix. It alone is worth the price of the book. The lack of maps and other graphic materials in no way detracts from the value of the work.

In summary, this is an intellectually provocative book, filled with factual information for the uninitiated historian or geographer and thought-provoking ideas about colonial man-land relationships in New England for the cognoscenti, and all at a good price.

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Man, A Geomorphological Agent: An Introduction to Anthropic Geomorphology. *Dov Nir.*

Boston: D. Reidel Publishing Co. and Jerusalem: Keter Publishing House, 1983, xii and 165 pp., maps, diags., index, and biblio. $45.50 cloth (ISBN 90-1401-0).

The role of cultural intervention in the landscape is not a new theme for geographers, but a volume devoted explicitly to the geomorphic agency of human beings is indeed noteworthy. Professor Nir, an Israeli geomorphologist with French training, has taken that final logical step of organizing a book around the direct and indirect sectors of human activity. He begins with an historical overview of changing perceptions in cultural geomorphology, and of the demographic, social, and economic forces that impinge upon geomorphic "steady state." The substantive chapters deal with: (1) The immediate effects of deforestation on soil profiles, erosion, and sedimentation; (2) the impact of overgrazing; (3) the cumulative impact of cultivation practices and irrigation or drainage, particularly in regard to "accelerated" erosion and conservation methods; (4) mining and its impli-

cations for landscape change, including the creation of artificial landforms and slopes; (5) the geomorphic effects of road building, bridges, canals, and pipelines; (6) riverbed changes owing to levee construction, channel shortening, and dams; (7) shore zone management, including "protective" devices and land reclamation; and (8) the impact of settlements, during and after construction, on hydrology and erosion/sedimentation. The final chapter attempts to quantify the rates of culturally modified geomorphic processes and then outlines a "model in anthropogeomorphology." An appendix of two pages discusses the influence of warfare.

The value of this volume lies in its unabashed focus on the human impact, not simply as a factor modifying specific environmental systems but as the pivotal agent. But an average of 15 pages per chapter is hardly sufficient to develop any one theme in depth, and considering the scope of the agenda, the bibliography is equally inadequate. "Steady state," for example, is invoked (pp. 11–13) without proper explication and apparently without any appreciation that the concept is a difficult one. "Biostasy" and "rhexistasy" are casually introduced, without documentation of any sort (p. 21), and will hardly enlighten the average student. Quantitative data are provided but sparingly and rarely up-to-date; the reader would be better served with Goudie's selection of such data in *The Human Impact: Man's Role in Environmental Change* (1981). The author also devises an index of potential erosive hazards that includes measures of erosion for specific climatic zones and relief categories, for which no argument or empirical bases are given (pp. 139–41). These contradict the available observational evidence (e.g., Jansen and Painter, "Predicting Sediment Yield from Climate and Topography," *Journal of Hydrology,* 1974), which demonstrates that relief heavily outweighs the influence of precipitation seasonality and intensity—factors overemphasized by the well-known but quite misleading Fournier index, which seems to have influenced the author's selection of climatic "constants." Such examples suggest a lack of geomorphological rigor that, in my opinion, is indispensible in a book of this sort.

The author's experience in synthetic, regional study is reflected positively in the attention given to cultural features. Thus the discussions of terracing and ridged fields are welcome. Although excessively brief, such themes provide a broader perspective, if for no other reason than that the author draws on nonanglophone literature. But flaws can also be cited here, such as the implication that the urban population of Morocco, Algeria, and Tunisia is heavily concentrated in oases (p. 138). The author's two cultural variables that provide proxy data for erosive hazards are the percentages of urban population and illiteracy; by this standard, Lesotho, perhaps the world's worst example of ongoing erosional destruction (sufficiently blatant to show on conventional Landsat imagery), ranks in an intermediate range, comparable to the U.S.A. Another weakness that transcends matters of detail is the limited attention given to remedial efforts or to environmental management.

These criticisms reflect my disappointment that the author has not been fully successful in implementing an excellent concept, based on a challenging thematic syllabus. And these comments must be viewed in the context that I found the book both refreshing and stimulating. Although the publishers must be faulted for setting an unrealistic price on a book modestly produced with "grainy" photographs, the author can be commended for fleshing out the agenda for an alternative mode of presenting geomorphology to undergraduates. One can hope that he, and others, will ultimately succeed in developing an effective "anthropogeomorphology" that will serve the needs of geographical instruction.

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