which were unavoidably contaminated with copyists' errors (and hence Huber's statistical approach). Ambiguous data often characterize the cutting edge of science, and discussion of the point would have added another dimension to Bauer's analysis.

With the decline of interest in Velikovsky, another, surprisingly similar, challenge is facing the scientific establishment: so-called "Creation Science" whose extreme form calls for a 6,000-year-old Earth geologically shaped by Noah's flood. Fossil footprints of a giant humanoid beside indisputably genuine dinosaur prints in the rocks of the Paluxy Creek, Texas, are taken quite seriously by many of these fundamentalist, Biblically-literalistic people. Bauer's closing chapters on "Means of Persuasion" and "Some Realities about Science" offer sound advice about pitfalls to be avoided in these "trans-scientific" debates, where probabilities, values and desirability are at stake. How successfully his analysis can be brought to

bear upon this new challenge remains to be seen. But arguing that the creationist ideas have been heard before does not seem to be a cogent strategy. Rather, we must argue that even if science is "never completely final, always subject to question and doubt" (as Einstein put it), nevertheless it is of a piece, not easily shredded, and the process of building this coherent tapestry is what science is all about.

Beyond Velikovsky is awkwardly repetitive, not as complete as it might appear at first glance and in its own way rather too polemical. Its system of references, numbered but unattributed in the text itself, is seriously distracting. Nevertheless, the account is detailed, thought provoking, and the best yet written on a bizarre episode that continues to smoulder in the annals of science. □

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Continental epic

Robert M. Hazen

Landprints: On the Magnificent American Landscape.

By Walter Sullivan.

Times Books, New York: 1984. Pp.384. \$22.50.

"THERE is no epic tale to compare with the account of how the North American continent came to be." So begins *Landprints*, one of the finest popular earth science books to appear in decades. In this recounting of the 3,500-million-year evolution of the mountains and valleys, rivers and deserts of North America, Walter Sullivan, the science editor of the *New York Times*, has achieved a masterly blend of geomorphology, historical geology, geophysics, structural geology, palaeontology and geodynamics.

The book consists of 37 short, self-contained essays on the principal features of the American landscape. Inspiration for this geological feast came from the author's frequent transcontinental flights; as Sullivan observes, many of the continent's landforms are best viewed from the air. The first two dozen chapters, therefore, focus on striking geomorphological features — parallel ridge systems, meandering rivers, volcanic craters and cones. The White Mountains, Wyoming basins, Hawaiian Islands and the Grenville Province are among the many areas which are examined first in terms of their distinctive aerial appearance, but then also from the standpoint of their underlying geological structure and history. In this way Sullivan gradually introduces current views on plate tectonics, continental subduction, and the regional folding and faulting that

are associated with mountain building.

The last third of the book emphasizes the dramatic alterations of the Earth's surface imposed by man. Farms and mines, cities and suburbia have all left their distinctive imprint on North America, and Sullivan discusses both their geological and environmental significance. He explains why East Coast cities grew up along a former continental shelf margin (the "fall line"); he shows how rock erosion influences soil chemistry, which in turn controls the predominant crops of American farms. From aerial observations of the distinctive patterns caused by centre-pivot irrigation, hydroelectric dams and strip mining, Sullivan proceeds finally to consider the possible consequences of man's actions on his environment.

Landprints is graced by a magnificent collection of photographs and other illustrations. Aerial and Landsat photos — more than 150 of them — display the variety and splendour of North American topography, both natural and man-made. Views of ancient craters, barrier islands, dune fields and the crazy-quilt of America's farms, photographs of road-cuts, regional maps and schematic diagrams of geological processes, all enrich the presentation.

This is a beautifully produced book, too, with clear typography, a felicitous layout and sturdy binding. The writing is stylish and informative, in the best tradition of popular scientific literature; Sullivan brings to his subject an infectious sense of wonder and enthusiasm — he entertains as he teaches. Anyone interested in science, particularly those who travel frequently by air, will be well rewarded in reading this continental epic. □

Robert M. Hazen is at the Carnegie Institution of Washington's Geophysical Laboratory, Washington, DC.

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