

Denis Wood. *Five Billion Years of Global Change: A History of the Land.* : Guilford Press, . 336 pp. Bibliographical notes, index. \$19.95 (paper), ISBN .

Reviewed by This Rutishauser, Institute of Geography, University of Bern, Switzerland.
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Observed recent changes in climate and their impact on ecosystems worldwide have not only been detected and discussed within the climate science community, but also have gained large attention in the media and the public. The debate about climate and, in a more general sense, global change has evolved into one of the most fiercely debated subjects in recent decades. Ever-increasing evidence shows that global and hemispheric mean temperatures have risen in the second half of the twentieth century; the decade of the 1990s was the warmest on record and most probably the hottest of the last millennium. The speed of the warming trend is most probably the highest in the past several hundred thousand years. For different periods, but during the same time span of the past century, cooling trends were observed on a regional scale that complicate the experts' picture of continual temperature rise on a global scale.

There are increasingly more resources available that address global environmental change through the ages. Information from climate archives such as ice cores, tree rings, and lake and ocean sediments have revealed changes for the time when thermometers were not yet available, but temperature reconstructions from these climate archives have also made it possible to put the direct measurements of the roughly past 150 years in a longer-term perspective. In a recent publication, *Global Change in the Holocene*, Anson Mackay and colleagues compiled just such a state-of-the-art collection of knowledge of global climate analysis, focusing on the North Atlantic-European area.[1] These contributing experts puzzled together the various climate archives, highlighting strengths and weaknesses. Their book provides not only valuable information for paleoclimatologists, but also offers a comprehensive overview for a broader audience. Any scientist whose field is somewhat related to or influenced by climate change processes gets a compact overview of the Holocene climate changes for the bookshelf. More importantly,

Global Change in the Holocene shows the possibilities and limits for climate reconstructions.

On a global scale, and written by hundreds of scientists, the latest report of the International Panel on Climate Change (IPCC) has shown that the causes of recent climate change are very likely influenced by human activities and the emission of greenhouse gases.[2] At the same time, the impact of climate change has been observed in ecosystems, such as changes in plant and animal distribution or biodiversity, and on humankind, including health, economy, and politics. Thus, the search for causes of the change is not to be found in the environment alone. The subject (humans) has also become the object. The need for understanding climate change goes beyond describing facts and figures of observed evidence; it also includes discussing human actions.

As the information reaches an almost unmanageable quantity, and discussions--as well as political actions--have become fierce on many fronts, many uncertainties still remain. In times of rapid change, it is no surprise that the discourse also includes terms from the vocabulary of belief. Denis Wood has contributed to this genre of global change literature with his book *Five Billion Years of Global Change: A History of the Land*. The main text contains a history of the land that puts the current changes of the Earth into the context of its entire existence; today's Earth has slowly developed since the Big Bang five billion years ago. An additional ninety pages are devoted to the review and interpretation of a wide range of scientific literature that ensures the possibility for further and in-depth reading on certain topics.

Wood, a trained and experienced geographer and the author of the best-selling book *The Power of Maps* (1992), is well aware that every picture of the world is interpreted many times. First, by the author who creates a certain picture, but also secondly, by the readers, as many times as there are readers. It is no coincidence that Guilford Press

advertises Wood's new *oeuvre* for "all readers interested in the history of our planet and concerned about its future," because every human being is affected.

Bringing together a huge pile of scientific facts from astronomy, geology, physics, and climate sciences, as well as anthropology and history, Wood tells his story of the Earth as his "history of the land." But the compilation of facts must not be enough. Seeing the Earth's history as a play, Wood states that the "stage" is everything we call "prehistoric." The "action" within the play is the "historical" time span since humankind appeared, which has left more and more traces. This perception of the world splits the play into two parts that are actually and originally one. In the course of the main text, Wood tries to overcome this view by stating that humans are made of matter that was created by the Big Bang five billion years ago.

"It all comes from the land" (p. 9). Structured in ten chapters, Wood explains this introductory statement in the form of a prayer wheel throughout the book. Chapters 1 and 2 are devoted to the perception of space ("Missing the Global in the Local and the Local in the Global") and Wood's concept of history ("The Idea of Prehistory Makes It Hard to Think about Global Change"). Subsequent chapters describe the evolution of the Earth. Chapter 7 through 9 describe the gradual take-over of the planet by humans: "The Land Covers Itself with Plants and Animals (and the Human Animal Comes down from the Tree)," "The Land Covers Itself by Humans," and "Humans Cover Themselves with the Land." The concluding chapter is devoted to a regional case study that applies these ideas to Puerto Rico and its evolution in the course of the past five billion years.

Besides a thorough and critical review of scientific literature, another achievement has to be acknowledged. For the cause of understanding global change processes, Wood takes the power of words and forms a new, arousing, and persuasive language for the topic. As a professor in a country where many citizens believe in biblical explanations of the Earth's creation, Wood applies the suitable language. From the pulpit of science he proclaims his views in a simple, logical and understandable manner. Even though his prayer wheel can be annoying, Wood draws convincing conclusions: Big Bang--condensation of the solar

nebula and accretion of the terrestrial sphere--evolution of the continents, flora and fauna--appearance of humans--development of agriculture and culture. From the beginning until the present, matter has always been the same, but appears in different forms. Based on this reasoning Wood writes, "we are the land and the land is us" (p. 149).

Wood is far beyond self-proliferation and argues for ecological thinking and sustainable actions by everyone. The reader who takes up the challenge is forced to reflect on the actions that contribute to the changes in the land. The author walks a thin line, balancing everyday examples with existential philosophical thoughts. Reaching out for a broad audience that regularly attends church, Wood is convincing.

Denis Wood has written a touching *History of the Land* that points the senses towards hidden places. Even though simplification and summaries could distort research results of the contributing scientific branches, Wood manages to compile the most important results from the respective fields in an exemplary interdisciplinary way. His book broadens the horizon of specialists while at the same time offering a compilation of the literature and scientific environmental thinking for an interested general audience. Denis Wood describes the "play" of *Five Billion Years of Global Change* in a convincing way, while giving his audience perspective and making them aware of the local and personal actions that influence global changes. His approach is important for humans that have to deal with facts and figures of increasingly rapid changes in the daily news in an ever more complex and globally linked world.

Notes

[1]. Anson Mackay, Rick Battarbee, John Birks, Frank Oldfield, eds. *Global Change in the Holocene* (Oxford: Oxford University Press, 2003).

[2]. John T. Houghton et al., *Climate Change 2001: The Scientific Basis* (Cambridge: Cambridge University Press, 2001).

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