



Climate Change: Biological and Human Aspects (2nd ed.)

Jonathan Cowie (2012)
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The role of climate/weather in relation to society, agriculture (food provision), energy production and use, human health, etc. cannot be underestimated, which is why climate change has become a mainstream political issue. Its significance is also reflected in the numerous books which have recently been produced which deal with climate, its real and potential changes, and possible impacts. This book comprises eight chapters which divide equally between the record of past climatic change, and changes and impacts post 1600AD (the Little Ice Age), including human responses.

The introductory chapters considers various components of global climate (e.g. the greenhouse effect, carbon cycle and hydrological cycle), and how they are interact. Then the all-important techniques of climate reconstruction are described. Biotic indicators including pollen analysis and dendroecology are used, though there is no mention of beetles or snails, alkenes and 180 isotopes. Examples of abiotic indicators are isotopes of water and carbon content

of ice cores. A notable absence is a discussion of amino acid racemisation, an innovation developed in the last 30 years, to date fossil biological materials such as bone or shell.

Cowie chooses 1600AD as the beginning of modern times. There is a case for this: it was the beginning of significant scientific research endeavour and, not least, the start of meteorological records. It was also, as I have pointed out (Mannion 2006), one of several carbon thresholds; in this case it was the expansion of Europe that led to a major shift in carbon capture by humans. Chapter five documents climatic change and its biological impact since 1600AD. Of especial importance are records of atmospheric carbon dioxide and other gases in polar ice cores which show huge increases in greenhouse gas concentrations; why do sceptics believe that this is insignificant!

What is happening today is the focus of chapter six. Few areas of the world are devoid of evidence for climatic change, or indeed other types of change. Ocean biota and chemistry are altering, declining and acidifying respectively. Terrestrial floras and faunas and their productivity at low and high altitudes are altering in composition (Tansley would be enthralled!), flowering/fruiting/hibernating dates are altering; sea levels are rising, ice caps and glaciers are melting, temperatures are rising and the incidence of extreme weather events is increasing. Case studies from diverse regions illustrate these changes.

Population growth and technological development are, as is examined in chapter seven, the basic causes of climatic change though the relationship is complex.

What, if any, should the responses of governments be to these issues? These questions

of sustainability are addressed in the final chapter. This book provides a reasonable synopsis of the material available on climatic change and is thus a useful addition to the literature. The graphs, diagrams, etc. are informative as are the reference lists at the end of each chapter. It would have been more convincing if Cowie had avoided the awful and indefinable 'we' which always fails to impress, especially in a book with a serious scientific message. At £34.99 this is a reasonable price for a good-sized text.

REFERENCE

Mannion, A.M. (2006) *Carbon and Its Domestication*. Springer, Dordrecht.

Antoinette Mannion

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