

Conflict and concern

David Victor

Energy Policy in the Greenhouse: From Warming Fate to Warming Limit. Volume 1. By F. Krause, W. Bach and J. Kooney. *Earthscan, London: 1990. Pp. 224. £29.95.*

Global Warming: The Greenpeace Report. Edited by J. Leggett. *Oxford University Press: 1990. Pp. 554. Hbk £19.95, pbk £5.95.*

RECENT additions to the burgeoning supply of books on global warming have generally offered few novel insights. General readers will find these two new studies of the science and policy issues adequate; experts in the field should recognize virtually all of the arguments. Readers sympathetic to the underlying argument of both studies — that policies should rapidly be set on the risk that climate change will be extreme — will find support for their position in these studies. Critics may be annoyed by the abundance of unsupported statements and speculation.

Despite its title, *Energy Policy in the Greenhouse* devotes little attention to energy policy. Instead, it is an overview of various issues related to global warming, emissions of greenhouse gases and assorted policy options.

Most other studies follow the tradition of energy modelling and start with assumptions about energy use, calculate greenhouse-gas emissions and then predict future warming under various possibilities. Refreshingly, *Energy Policy* takes the opposite approach; the authors start with a conservative "warming limit" from which they compute acceptable patterns of greenhouse-gas emissions.

The other main feature of this study is the integration of geophysical and greenhouse-gas emissions models. Notably, the authors present a persuasive case for examining temperature increases over time — known as the transient climatic response — which they argue should be limited to a tenth of a degree centigrade per decade (a reasonable number based on the rate at which trees can adjust to climate change). Only a few other studies have explicitly linked the transient response of the Earth's climate to energy; as such, this research is innovative.

Unfortunately, the report is poorly integrated. Alternative scenarios that are laboriously developed and analysed early in the volume have little relevance to the policy recommendations which emerge later. In all, I have been able to identify at least 28 distinct possibilities which appear at various points in the study. Especially unfortunate is the lack of continuity between the geophysical modelling and the emissions modelling. Furthermore, innovative consideration of the transient response dissipates after the first third of the book. In the final chapters, the range of scenarios the authors deem acceptable

is dominated by static conceptions of warming and does not reflect the limits and opportunities of the transient response.

Throughout the book, the authors posit incisive questions yet answer these queries without analytical rigour. The policy recommendations span a wide range of industrial and agricultural practices, but the report sacrifices depth in its attempt to be comprehensive. (But readers should look forward to volume 2, currently in preparation, which focuses more sharply on energy policy.)

The *Greenpeace Report* is a collection of nineteen essays organized around the science, impacts and policy responses related to global warming. Readers will recognize these as the same organizing principles of the three working groups of the United Nations-sponsored Intergovernmental Panel on Climate Change (IPCC) which has been preparing a consensus report on global warming for the past two years. The Greenpeace view of global warming is framed in a critique of the IPCC report.

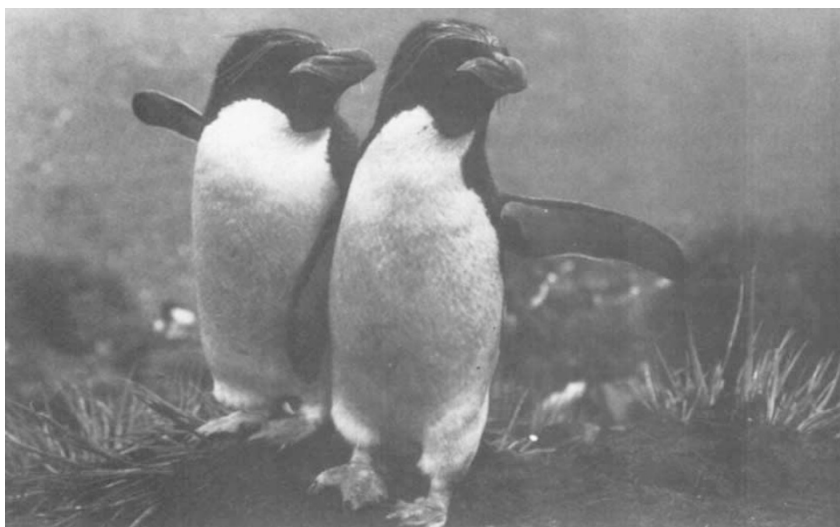
Greenpeace argues that IPCC has (1) failed to make the risks of climate change apparent, (2) systematically understated the effects of climate change and the risks of extreme change, and (3) failed to recommend stringent measures to slow and reverse global warming. This third

attack on IPCC's policy recommendations forms the bulk of the study.

The quality of the *Greenpeace Report* is uneven. Several of the essays are notable, including those by Birgit Bodlund *et al.* on Sweden's electricity sector and by Norman Myers on tropical forests (both of which are versions of studies reported elsewhere). Amory Lovins provides his familiar but compelling case for least-cost planning, arguing that it is cheaper to save energy by increasing efficiency than it is to purchase new energy sources. According to the argument, controlling global warming can be profitable.

Some interesting hypotheses emerge from least-cost planning and the data presented by the Greenpeace authors. For example, Bill Keepin repeats his claim that carbon emissions can be reduced at 0.012 tons per dollar invested in energy efficiency, whereas building nuclear plants to offset carbon emissions only displaces 0.002 tons of carbon per dollar. But Myers' numbers suggest that reforestation offsets carbon at an even more efficient 0.75 tons per dollar. Accordingly, every dollar invested in energy efficiency could therefore displace six times the carbon if it were invested in reforestation.

Based on Keepin's data, the concluding chapter of the *Greenpeace Report* argues that: "Expansion of the nuclear-power industry . . . would involve diverting funds from cost-effective energy-solutions to the greenhouse crisis . . . [and] should have no role to play in the international policy response." Does Greenpeace believe that (considering Myers' data) investments in energy efficiency should have no role in the policy response because they divert funds from reforestation? Presumably the political answer is no, although their economic data may



Double greetings — A pair of macaroni penguins on their tussock mound nest site in the Welcome Islands of South Georgia. *Wild Ice: Antarctic Journeys* by R. Nareen, C. Monteath, T. de Roy and M. Jones is a desk-top voyage to the Antarctic, illustrated with stunning photos of the wilderness and the birds and animals there. Published by Smithsonian Institution Press, price is \$29.95, £19.95. □

favour such an extreme conclusion. What is missing from the synthesis is a close study of which policy actions are more important than others, given that the economics of greenhouse policy conflict with other social priorities.

Clearly there are empirical gaps in the climate policy literature, especially regarding financial cost. Thus, a first step in an international programme to slow global warming should probably include, for example, a diverse programme of reforestation to test Myers' data rigorously under real conditions. This research could be pursued in the near term without a full-blown climate agreement.

Beyond the wide range of scientific questions that remain unanswered, equally challenging is the need to develop effective policy measures which consider national styles of governance. Good greenhouse policy for one nation may not be appropriate for another, in light of disparate cultural, socioeconomic and environmental conditions; useful policy analyses of global warming must tackle these pragmatic concerns. For example, it

is not sufficient for the Greenpeace authors to note that methane (a strong greenhouse gas) could be reduced by feeding cows better food. Instead, policy recommendations must go further and provide workable approaches to the salient, practical questions such as: how do we convince a North American cattle rancher and an Indian herdsman to feed their cows better food?

The political will which has coalesced around global warming is admirable, but urgent calls for immediate policy action must recognize that (1) relevant science and policy fields remain underdeveloped, and (2) concern for the greenhouse should not eclipse other pressing problems of our time. As both studies argue persuasively, these factors should not paralyse policy response. But severe climate change is not the only risk; misdirected policy also poses a serious threat. □

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Portrait of a dinosaur

Seth Shulman

Seabrook Station: Citizen Politics and Nuclear Power. By Henry F. Bedford. *University of Massachusetts Press: 1990. Pp.224. \$22.95.*

IN the decade since the partial meltdown of the Three Mile Island Unit 2 reactor in Pennsylvania in 1979, the construction of new nuclear power plants in the United States has ground to a virtual halt. No new reactors have been ordered since the accident and all of the 47 units ordered since 1974 have ultimately been cancelled.

During this ignominious period for the US nuclear industry, the Seabrook nuclear plant in New Hampshire has stood as a powerful symbol of the faltering status of the industry — and of the wide-spread domestic opposition to nuclear power. Seabrook has now been licensed to operate, but angry critics and stalwart nuclear proponents alike rightfully see the process as a tragedy.

In 1967, when officials at a tiny New Hampshire public utility got the idea to build Seabrook, they planned two 1,100-megawatt units at a projected cost of \$425 million each. Now, in 1990, the utility has only marginally survived the two-decade ordeal. It has gone bankrupt. It has managed to build only half of the plant envisioned initially. The plant's construction has divided communities across New England, the process has cost the utility — and ultimately ratepayers — an

astronomical \$6,400 million, an amount that will be nearly impossible to recoup no matter how high the cost of oil.

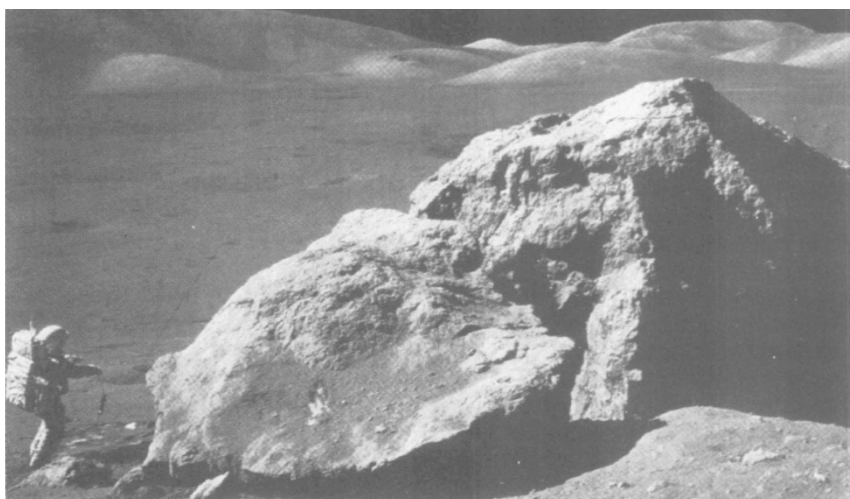
Bedford's book plumbs the depths of this remarkable story. This is not a referendum on the merits or hazards of nuclear power, but rather a lively, thoughtful and dispassionate look at a tangled and dysfunctional regulatory process. A book about bureaucratic politics may sound dull, but this one could never be so accused. Not with the high drama Bedford is able to chronicle; not with the cantankerous cast of characters involved every step of the way; and not with the nuclear hopes of so many tied to the success of the Seabrook project.

At face value, Seabrook's story is

fascinating itself, but it is Bedford's analysis of the interminable proceedings that makes the book special. He offers a remarkably sympathetic portrait of each side of the struggle over Seabrook, but also shows how each repeatedly abused the system. Much of the debate in the later years of the licensing struggle at Seabrook revolved around the issue of evacuation in the case of an emergency. As Bedford shows, for many months the entire fate of this completed reactor rested to a large degree on whether, in the event of an accident, a school bus full of local residents would overstress a particular town bridge, thereby jeopardizing the planned evacuation process.

By most accounts, it is now clear that Seabrook's siting was a blunder. Poised on the edge of a crowded summer beach resort, the possibility of safely evacuating the summer population in the event of an accident is improbable at best. And yet the debate over siting was not allowed to take place in a meaningful way until the reactor was almost finished — hardly an ideal arrangement for either side. The residents, a great number of whom simply did not want Seabrook built in any form, stymied licensure by raising issues like the health of fish and the safety of bridges. These were ploys to stall — and hopefully stop — the plant altogether. Meanwhile, though, with so much money and vested interests resting on the plant, Bedford shows how the regulatory process was turned into a sham. The state and federal officials involved effectively rewrote almost every rule governing public safety to ensure the plant's operation. In essence, the process could be delayed, but the powerful players involved were not going to let the fate of an enormously expensive project be foiled by a bureaucratic technicality.

There is an important lesson here. As



Man on the Moon — Harrison Schmitt, geologist and pilot of the Apollo 17 Lunar Module, examines an enormous broken rock on the Moon in 1972. *The Cambridge Encyclopedia of Space* edited by M. Rycroft is "the most complete and up-to-date account of the conquest of space" published in one volume. Published by Cambridge University Press at £40, \$65. □