

*Laboratory Earth: The Planetary Gamble We Can't Afford to Lose*  
by Stephen H. Schneider  
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One would think it would be possible to present a coherent argument and discussion in a small book (154 pages plus 17 pages of introduction and preface), but Stephen Schneider fails in *Laboratory Earth, The Planetary Gamble We Cannot Afford to Lose*. That book casts doubt on the "Science Masters" series of which it is a part. The series is the creation of John Brockman, Schneider's literary agent. Apparently the book started out worse. The preface thanks eight individuals for editorial assistance, and another for psychological insights. Schneider also complains of appearing at "breakfast bleary-eyed from late hours of writing and editing." For all that, the book is still an inchoate and poorly written melange of Schneider's public lectures over the past several years.

As best I can tell, Schneider is trying to endorse both the study of the Earth as a system and the integrated assessment of potential damage from possible global warming. Schneider's prejudice is revealed when he presents the Paul Ehrlich-John Holdren formula,  $I=PAT$ : Environmental Impact equals Population times Affluence per capita times Technology used. This is in the part of the introduction where Schneider introduces population, affluence and technology as "the enemy". Here he also informs us that an altered climate is a "damaged climate." As an example of our perpetual tendency to degrade our environment, Schneider points to the period "centuries ago" when "uncontrolled coal burning fueled the infamous London smogs." (Those smogs occurred from the mid-1800s until the 1950s – hardly centuries ago. This is an early alert of this book's concern for accuracy.)

The book proper begins with some musings on how earth system scientists dream of having access to a time machine that would permit them to observe the origins of the earth and life. Lacking this, he casually describes the tools that are available for inferring such information. He then presents a crude description of the development of the earth and life or, as he refers to it, the coevolution of life and climate, that is bettered in most high school earth science texts. The book continues with chapters on climate, climate modeling, biodiversity, and integrated assessments of policy options. What is meant by integrated assessment is not explained by the author, but appears to refer to subjective estimates of the ranges of possible environmental impacts of human activities that can be used in turn to estimate costs that can then be compared with the cost of policy options. More will be said about this later, since it appears to be at the heart of whatever argument Schneider may be presenting.

## **Plausible Deniability**

A surprising amount of space is devoted to trivialities. Schneider tells us of heat being transferred by “fluids in motion, especially the atmosphere and the oceans.” We learn that the interactions of wind and sea-surface are “part of a set of processes known as air-sea interactions,” and that numerical rules used in computer models “today are called algorithms.” There are the usual claims that “most scientists” believe this or that (extended on page 121 to “most futurists”), as though most scientists were equally expert in geology, climatology and meteorology.

Throughout this discussion, Schneider threads vague suggestions of the relevance of greenhouse warming – he seems to want the reader to accept the danger of global warming as a fact but to allow himself deniability. This pattern is found in his earlier works. It is revealing to recall that in his 1976 book *Genesis Strategy*, Schneider reviewed the arguments made by others in support of global cooling and called those arguments “compelling.” And concerning a 1976 book entitled *The Cooling* (subtitle: *Has the next ice age begun? Can we survive it?*), by Lowell Ponte, Schneider wrote that “public awareness of the possibilities must commence, and Lowell Ponte’s book is a good place to start.” When he later denied having ever explicitly endorsed global cooling, critics pointed out that Schneider had co-authored a paper in *Science* that specifically stated that cooling from aerosols was more likely than warming from increasing carbon dioxide. Schneider then reversed his early denial and boasted that the fact that he had changed his view was indicative of the fact that he was a good scientist.

Schneider discusses early skepticism about the theory of plate tectonics, which was not accepted until after World War II. Schneider refers to a proclamation by the president of the Philosophical Society (not named by Schneider) in the 1920's that continental drift was “utter damned rot.” But the reference actually is to a book by John and Katherine Imbrie about how climactic changes can be driven by the variations in Earth's orbit. This use of inappropriate references is annoying for anyone who bothers to check. Clearly, the use of endnotes in this volume is not meant to provide real information. Nevertheless, Schneider offers this item to suggest that the predictions of significant global warming will, like the predictions of continental drift, come to be accepted despite present criticism and uncertainty.

This sensitivity to criticism, and Schneider's equating global warming theory (which is claimed to have the support of “most scientists”) with the long rejected continental drift theory is revealing. I assume this to be an implicit recognition on the part of warming advocates of the weakness of their case. Schneider insists that only the voices of supporters be heard. Others are referred to as contrarians.

For a description of contrary views, Schneider refers the reader to an article in *Harpers* by Ross Gelbspan. The article, not otherwise described by Schneider, is a vitriolic screed in which opponents to global warming are described as “interchangeable hood ornaments on a high powered engine of disinformation” paid for by industry. Schneider does inform the reader that Gelbspan is a Pulitzer Prize winning journalist. This is a strange claim. The Pulitzer Prize was awarded to the *Boston Globe* for an article that never lists Gelbspan in any capacity. Gelbspan did not write the article in question. Presumably, the *Globe* is permitted to associate anyone with a prize awarded to the paper, but that practice smacks of a policy which would permit deans to

claim shares of the Nobel Prizes awarded to faculty.

A surprising amount of this book is devoted to excursions that in no discernible way deal with central theme of the book. There are attacks on Aaron Wildavsky and Julian Simon for their views on biodiversity, and attacks on free market economists and economists more generally. The attacks are presented in a tone of lofty condescension, but are otherwise unconvincing. Presumably these attacks are designed to demonstrate the breadth of Schneider's concerns. Many of Schneider's claims, for example, about the successes of model predictions, are simply wrong and too numerous to list in a short review. Clearly, this is not a book for the serious reader. Rather, it seems to have been written to reassure the unsophisticated environmental enthusiast of the continuing possibility of doom.

### **Gambling on Guesses.**

Schneider is never clear about exactly what "gamble" he is referring to in the book's subtitle, "The planetary gamble we cannot afford to lose." Nevertheless, the book ultimately offers a fairly standard environmentalist approach to issues – at least in a rather impressionistic manner. First, his emphasis on the earth as a system is probably meant to suggest that everything is connected to everything. At some level, this is true but trivial. Quantitatively, many of the connections are too weak to be of practical significance. To get around this, Schneider next emphasizes uncertainty and subjective probabilities. The latter are guesses made by putative experts. Here, Schneider routinely associates very unlikely outcomes with 10 percent to 20 percent likelihoods. For example he associates a 6°C warming on page 133 with a 10 percent probability.

The naive reader might consider such probabilities as small, but in many scientific contexts they are huge, and they guarantee that scenarios constructed in the integrated assessments are bound to include scary possibilities at unreasonably high likelihoods. These then lead to the need for what Schneider generally refers to as "insurance" in the form of the usual energy and environmental policies that are commonly proposed by those in Schneider's ideological camp. It is a dishonest approach that ultimately has no relation to science.

### **Significant Variation?**

Surprisingly Schneider spends some five pages remarking on my response to a survey on climactic issues. His discussion is an example of his practice of suggesting that critics are "extreme" and thus incorrect, without actually addressing the issues in question. The survey was prepared in connection with an integrated assessment study by Granger Morgan and David Keith at Carnegie Mellon University. Schneider refers to a particular question as "typical," and notes that my answer differed from that of the other fifteen other "experts." The question was "What equilibrium change in global temperature did one expect from a doubling of CO<sub>2</sub>?" I had put forward a guesstimate of 0.3°C with a standard deviation of 0.2°C. The rest of the responses clustered around 2°C-3°C with very large standard deviations. Schneider implies that the fact that my response differed from the others discredits my response.

But the question he focuses on was not typical. The authors of the study noted that there were very large differences among the respondents for all the other questions. Further, the authors recognized that the tendency for the responses to the question at issue to cluster around the commonly presented model based value probably represented a herd instinct since the accompanying estimates of large uncertainty suggested that there was little real basis for the specific guess.

Now consider the question in question. A doubling CO<sub>2</sub> in the atmosphere results in a two percent perturbation to the atmosphere's energy balance. But the models used to predict the atmosphere's response to this perturbation have errors on the order of ten percent in their representation of the energy balance, and these errors involve, among other things, the feedbacks which are crucial to the resulting calculations. Thus the models are of little use in assessing the climatic response to such delicate disturbances. Further, the large responses (corresponding to high sensitivity) of models to the small perturbation that would result from a doubling of carbon dioxide crucially depend on positive (or amplifying) feedbacks from processes demonstrably misrepresented by models. Without the model results, one is left with little to suggest that there is significant warming caused by human activities, as opposed to the normal variability intrinsic to the climate system. In addition other studies, based on data, pointed to low sensitivity and negative rather than positive feedbacks. Whence my guesstimate.

Clearly, what dismayed Schneider was not so much my estimate, but my refusal to go along with a large range of uncertainty. Without large uncertainty, one cannot squeeze disaster out of integrated assessments, and hence, for Schneider, vagueness and uncertainty become the *sin qua non* for scientific credibility. My own feeling is that scientists can be wrong, but they should try to make their predictions definite enough for opponents to disprove.

### **The Usual Policies.**

Schneider concludes with a set of suggestions pulled from the 1991 report of the National Research Council, *Policy Implications of Greenhouse Warming*. These are meant primarily to be low-cost actions that are claimed to be worthwhile in and of themselves: continue to phase out of freons, stop deforestation, preserve biodiversity, control population growth, include warming considerations in all government planning, participate in international agreements and meetings on these issues. Without arguing the virtues or costs of these suggestions, it should be pointed out that they have almost nothing to do with warming. They were chosen because the report concluded that because the probability of global warming is so uncertain, large public expenditures to deal with this alleged problem are not warranted. Schneider fails to mention this conclusion. All that has changed in the years since that report was issued is that estimates of probable warming have been coming down.

Schneider claims, without explanation, that these suggestions could lead to emissions reductions of between 10 percent 40 percent, and that individuals as diverse as himself, the economist, William Nordhaus, and the "industrialist" Robert Frosch could agree on this. But Frosch is hardly an industrialist; he was working for General Motors at the time of the report, but

he had previously been administrator of NASA and head of the United Nations Environmental Program.

Moreover, the council that developed the report also included ardent environmentalists like Jessica Matthews, Maurice Strong, and Jane Lubchenco. The deliberations were contentious, and the environmentalists demanded and received many concessions. But even with this stacked panel, one paragraph from the report bears repeating: "Uncertainty cannot be ignored in responding to greenhouse warming. Errors of doing too much can be as consequential as errors of doing too little; the error of trying to solve the wrong problem is as likely as the error of failing to act. Above all, errors are inevitable, whether one acts or not, but inevitable errors are also occasions to learn."

While one leaves this short book with a certain distress at its parsimonious approach to truth, it is totally consistent with Schneider's philosophy expressed in an interview with Jonathan Schell in the October 1989 issue of *Discover*: "... we are not only scientists but human beings as well. And like most people we'd like to see the world a better place, which in this context translates into our working to reduce the risk of potentially disastrous climate change. To do that we need to get some broad based support, to capture the public's imagination. That, of course, entails getting loads of media coverage. So we have to offer up scary scenarios, make simplified, dramatic statements, and make little mention of any doubts we might have. This 'double ethical bind' we frequently find ourselves in cannot be solved by any formula. Each of us has to decide what the right balance is between being effective and being honest. I hope that means being both." Hope springs eternal.