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GILI, J. M., J. L. PRETUS, AND T. T. PACKARD [EDS.]. 2001. **A marine science odyssey into the 21st century**. *Scientia Marina* (suppl. 2) **65**: 1–326. Institut de Ciències del Mar, Barcelona. 326 p. EURO90. ISBN ISSN 0214-8358.

Before I enter into a discussion of this book, I should inform you of any possible conflicts of interest. The book is a supplement to the journal *Scientia Marina*, and records the invited lectures given at the 36th European Marine Biology Symposium. Although I am a member of the Editorial Board of this journal, I was in no way involved in either the meeting or the publication. Many of the papers are centered around the work and publications of Ramón Margalef. I first met Dr. Margalef when I was a graduate student, almost 50 years ago, and as a result of that meeting, I have spent two of my three sabbaticals in Barcelona. Of the three editors, I know Dr. Gili best, and in fact, on my last sabbatical in 1990, we ate our lunches together most working days. So I started this assignment with warm regard for the project before I even put the dustcovers away in a drawer.

I was surprised—no, amazed!—that the volume was produced so soon after the meeting. The meeting ended on 22 September 2001, and *L&O* recorded receipt of the book on 12 October 2001. This means that the editors were able to enforce strict deadlines on their contributors, a miracle that can only be appreciated in full by former editors. I suspect, though, that the copyediting was done in a hurry and in house; there are a number of jarring glitches, including the last sentence in the third paper, which simply walks off into space.

Unlike most collections of invited symposium lectures, this volume was assembled with a particular end in view. The editors state plainly in their short introduction that they wanted to recreate at this meeting the experiences they remembered from especially favored meetings in the past and to incorporate these experiences in print, where they might serve as a guide and inspiration to younger workers. We can all sympathize with these aims. Many of us can remember meetings, usually small symposia, where we felt the true nature of science was displayed and where even the air should have been bottled, to be taken home and sniffed at moments of discouragement or during tedious faculty meetings. For me, these inspirational meetings were the Cold Spring Harbor Symposium on Quantitative Biology in 1957 and any of the Chemistry of the Mediterranean Symposia held in what was formerly Yugoslavia.

I don't know how well this volume reflects the atmosphere of the meeting, as I was not there. How well does it reflect the aim of the editors? Really not all that well. The distribution of lectures is about what one would expect at such a meeting, with only a few of the speakers actually addressing the question of where marine biology would or should go in the century ahead. Most papers dealt with some subsection of the subject; the few that attempted to look at the field as a whole spoke of the need for generalists who would pull together the findings of the specialists and of the teams of specialists. Such people—I think we used to call them 'naturalists'—are needed just to keep up with the literature linking the various fields within marine biology. If one wants to link the biology of the oceans with the physics and chemistry and then tie these results to weather patterns at one end of the scale and molecular motions of water molecules at the other, one can see the need of perhaps a new kind of specialist, someone who thinks in linkages and can speak the languages of the several disciplines. How we would educate such persons I do not know, since our present uni-

versity organization militates against any but the narrowest specialization, in spite of considerable lip service to the cause of interdisciplinary research. For a while, I had hoped this niche would be filled by the modelers, but it has become obvious that the modelers talk primarily to other modelers and read the works of other modelers.

That the papers do not fulfill all the wishes of the organizers of the meeting and the editors of this volume cannot truly be blamed on the editors. In this sort of publication, the most the organizers of the meeting can do is publicize their meeting aims, issue invitations to their selected speakers, and then hope the speakers adhere to the program as outlined. Where they do not, it would be an especially courageous (read "dictatorial") editor who would reject an invited lecture. In short, in a volume of invited lectures, everything depends on the choice of speakers and on their sympathy for and understanding of what the organizers are trying to achieve.

So what does one get in this volume? This is a collection of theme-setting talks, so one does not expect to find new data and original work. However, a number of observations, perhaps known generally in their special fields, were brought to the attention of the larger and more biological world of this meeting. Walter Munk's discussion of spiral anomalies in the sea surface, so large as to be invisible from oceanographic vessels but clearly visible from space, demonstrates that we still have a great deal to learn about spatial discontinuities in the oceans. Similarly, the paper by T. S. Hopkins points out discontinuities in time in the oceanic current systems, changes likely to become important in a period of climatic change. He also makes a heroic attempt to include political and economic factors in his closed-loop systems, things usually ignored by biological modelers. Yet economic factors were chiefly responsible for the destruction of the Grand Banks cod fishery, and political factors contributed to the decisions made in its management. While both politics and economics are considered to have a basis in science—economics as the dismal science and political science as, well, political science—I think at this time, the best we can hope for is their incorporation in "what-if" models, with considerable latitude assigned to the variables.

There are 21 papers in this collection, ranging from nutritional chemistry to food chains taken as a whole and from the microscopic to the view from space. Read singly, many of the papers make a plausible argument for considering their particular concern as the most important, perhaps the controlling factor, in whatever piece of the universe they are describing. When read as a group, they convince you that when properly construed, everything is important. I particularly liked the argument by Jackson and Sala that in our food chain modeling we should remove the top predators, since we have eaten them all. I would amend the argument to read that now there is only one top predator, and, to paraphrase Pogo, it is Us.

I'm at a bit of a loss as to how to sum up this volume. It doesn't point the way to tomorrow's research in marine biology, but who can really do that? So much depends on serendipity and the unexpected "Ah ha!" factor, along with the invention of new instruments of measurement. One can argue that the greatest advances in physical oceanography were spurred by the development of the salinometer, which eliminated that great source of variability, the salinity titration, as well as making measurements available in real time.

The book does serve as a useful record, a snapshot, of where we are today and how we are thinking about proceeding. In most cases, the articles, constrained by the time allotted for the lecture, are too short to do much more than whet our curiosity about topics unfamiliar to us. For those who were at the meeting, the volume may

serve as a reminder of other papers, of conversations, and of projects planned perhaps over a Torres tinto. For the rest of us, it will have to do as the next best thing.

Peter J. Wangersky

School of Earth and Ocean Sciences
University of Victoria
P.O. Box 3055
Victoria, British Columbia V8W 3P6, Canada