aquifers by hydrocarbons, heavy metals, sewage, and other pollutants, and even the filling of caverns with explosive or toxic gases are the real features of interest. Jennings mentions the importance of this very practical aspect of karst geomorphology in the preface of the book, but he does not discuss it at length on the grounds that a satisfactory exposition would require too much space.

Jennings died of a heart attack while skiing in 1984. This book is his last statement on the subject of karst. It communicates much of his love of landscape and is highly recommended as an introduction to the subject.

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A Reunion in Physics

Shelter Island II. Proceedings of the 1983 Shelter Island Conference on Quantum Field Theory and the Fundamental Problems of Physics. ROMAN JACKIW, NICOLA N. KHURI, STEVEN WEINBERG, and EDWARD WITTEN, Eds. MIT Press, Cambridge, MA, 1985. xii, 369 pp., illus. $37.50.

In early June of 1947, a group of 24 physicists gathered at the Ram's Head Inn on Shelter Island, a remote, sparsely populated island located about 100 miles east of Manhattan near the end of Long Island. Their 2½-day meeting was the first major postwar theoretical physics conference in the United States. Its purpose was to bring together leading researchers to discuss some of the outstanding problems in quantum theory. (The list of participants reads like a Who's Who in Physics.) The impact of that meeting is now part of history. Indeed, as a direct consequence, Hans Bethe produced his famous Lamb-shift calculation and Robert Marshak proposed the two-meson hypothesis. Even more important, the seeds were sown for Richard Feynman's and Julian Schwinger's classic works on quantum electrodynamics and later more formal developments in renormalization theory. Those breakthroughs laid the foundation for our present-day theories of elementary particle physics.

To commemorate that historical meeting, a second Shelter Island Conference was held in June of 1983 at the same Ram's Head Inn. Besides providing a reunion for the class of 1947 (ten of the original 24 participants returned), Shelter Island II was organized in the same spirit as the earlier meeting, to bring together a relatively small group of researchers who would survey the state of elementary particle physics and discuss future directions. Some of the proceedings of that meeting have been edited and collected in *Shelter Island II*.

The first part of the book contains scientific talks by some of the world's leading physicists. It begins with a kind of state-of-theory address by Murray Gell-Mann. As always Gell-Mann is comprehensive and entertaining. (I was particularly amused by his linguistic anecdote that the *f* in O'Raifertaigh, the name of a well-known Irish physicist that I always have trouble spelling, should really be *thbh*.) Gell-Mann provides a nice perspective on how far theoretical physics has advanced and what problems remain. One of those problems—how gravity can be unified with the other fundamental forces—sets the theme for most of the meeting. Subsequent talks range from technical discussions by Steven Weinberg, Michael Duff, and Edward Witten of Kaluza-Klein theories, in which gravity is fundamental and the other forces are a result of compact extra space dimensions, to Stephen Adler's description of gravity as an effect induced by embedding the other fundamental forces in curved space-time. Advances in supersymmetry, an important ingredient in attempts to tame the short-distance infinities of quantum gravity, are discussed by Bruno Zumino and P. C. West. There are also survey talks less (in some cases, not at all) concerned with gravity by T. D. Lee, Roman Jackiw, Alan Guth, A. D. Linde, S. W. Hawking, and Toichiro Kinoshita, who discuss their current research efforts. All of these talks are clear and well written, but I particularly appreciated those on the new inflationary universe cosmology by Guth and Linde, two of the pioneers in that field. However, if Shelter Island II is to have a scientific legacy, I would guess that it might stem from a talk by John Schwarz, "a brief survey of superstring theory." Schwarz and his collaborators have argued for more than a decade that we must abandon our point particle approach to physics at short distances and reformulate theories in terms of string variables. Not long after Shelter Island II, a technical breakthrough by Michael Green and Schwarz led to a viable superstring theory of all interactions found in nature. As a result, during the past two years superstring research has dominated elementary particle theory. Indeed, some superstring enthusiasts have likened the present situation to the exciting early days of quantum mechanics. If this is true, it would make for an interesting Shelter Island III meeting.

Although the scientific proceedings are enjoyable, I prefer the part of the book devoted to historical perspectives. Personal recollections by participants in Shelter Island I make captivating reading. Even more fascinating is a history of Shelter Island I by Silvan Schweber. Schweber chronicles the organization of the meeting, the meeting itself, and subsequent meetings in the Pocono Mountains and Peekskill, New York, at which quantum electrodynamics was reformulated. Schweber's description of a police-escorted bus ride by the conference participants from Manhattan to Shelter Island, dinner hosted by a proud local chamber of commerce, newspaper coverage, and the like combined with a splendid group photograph bring the conference to life and contrast it sharply with today's very different style of conferences. I strongly recommend the section of historical perspectives, particularly Schweber's contribution, to any physicist or student of history. It distinguishes this book from the far too many conference proceedings one regularly receives and earns for it a treasured place in one's permanent library.

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Life in the Universe

The Search for Extraterrestrial Life. Recent Developments. MICHAEL D. PAPAGIANNIS, Ed. Reidel, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, MA). xxvi, 579 pp., illus. $64; paper, $29.50. IAU Symposium no. 112. From a symposium, Boston, June 1984.

Three topics in astronomy seem to hold endless fascination for scientists and layfolk: black holes, the origin and structure of the universe, and extraterrestrial life. Of the three, extraterrestrial life is easiest to visualize and even to identify with. Following a considerable period of marginal legitimacy, the search for extraterrestrial life has attained respectability, and the International Astronomical Union recently established a new commission, Bioastronomy, to deal with the subject. The book under review is the proceedings of the commission's first official scientific meeting, held in 1984. The most recent proceedings of previous meetings on