complaint is that the authors always use the language of complex manifolds and holomorphic sheaves, and do not point out that everything they say makes sense in abstract algebraic geometry over an algebraically closed groundfield k. In fact, with the exception of Chapter II §2 on the generic splitting type of a semistable bundle, there is no need even to suppose the groundfield of characteristic 0.

ROBIN HARTSHORNE

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Elements of soliton theory, by G. L. Lamb, Jr., Wiley, New York, 1980, xii + 289 pp., $29.95.

Until comparatively recently in the history of science, mathematics and physics lived in close relation. The advance of physics suggested the development of new mathematics, and conversely the progress of mathematics fed into the way physicists thought about nature. This contact remained strong until the 1920's, when it began to ebb, reaching a low in the 1950's. What is beginning to bring us together again are two striking developments of science in the 1960's–the successful application of Lie group theory and differential geometry to elementary particle physics and the theory of *solitons*.

The first topic was the result of efforts by a thundering herd. In contrast to this 'big science', the theory of solitons was the remarkable creation of a small group–Kruskal, Zabusky, Gardner, Greene and Miura–working at Princeton (but not in the mathematics or physics department!). That the roots of the theory lie in the 19th century work on hydrodynamics of Scott Russell and computer studies of solutions of nonlinear differential equations by Fermi, Pasta and Ulam in the 1950's has been recounted many times, [**1**, **2**], and will not be repeated here.

The Princeton group produced a complex of original ideas that has had a remarkable success and influence in contemporary science. Their theory was developed with the traditional tools of the physically-minded applied mathematician: classical differential equation theory, the mathematics of quantum mechanics, scattering theory, etc. A remarkable quality of their work is that it linked 19th century analysis and geometry with some of the most modern parts of functional analysis, differential, and algebraic geometry.

This book is an admirable attempt by a physicist-applied mathematician to present an introductory account of the theory of solitons from some intermediate point on the scale of mathematical sophistication. Lamb explicitly excludes an attempt to describe the geometric or Lie theoretic side of the theory, although his own research work is in this direction. Since a mathematician who comes to the subject cold and tries to read this book or the original literature [**3**, **4**] will probably have difficulty seeing the forest for the trees, and the 'geometric' point of view is valuable precisely for the overall perspective it