

BOOK REVIEWS

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Symplectic geometry and analytical mechanics, by Paulette Libermann and Charles-Michel Marle. Translated by Bertram Eugene Schwarzbach. Mathematics and Its Applications, D. Reidel Publishing Company, Dordrecht, Boston, Lancaster, Tokyo, 1987, xvi + 526 pp., \$89.00. ISBN 90-277-2438-5

This is the most recent of several books appearing over the last fifteen years or so which well may help to restore analytical mechanics to the important place it once occupied in the training of mathematicians. Courses in this subject, then known as “rational mechanics”, were standard fare in many mathematics departments until about 50 years ago, at which time they virtually disappeared and the subject went underground for a generation of mathematicians—at least as far as graduate study in the United States was concerned. Of course, it did not disappear as a topic of research, and in fact this spate of excellent books has surely resulted in large part from the profound and exciting research which has been done in analytical mechanics or has been suggested by it over this same period, and in some part too from the tremendous advances in related manifold theory and differential geometry, which have revolutionized the approach to mechanics and made much of this work possible. Happily there now exist several extremely well written and carefully designed texts from which a graduate student or working mathematician can learn this important subject, the well-spring of so much mathematics, and can even come up to the very frontiers of research. Of these the books of Arnold [1] and Abraham and Marsden [2] may be the most frequently used and best known (in English). To this I would add one of the earliest of this breed, Godbillon [3], which like the other two is extremely clear and well written but which because of its more limited scope has the advantage (especially for the beginner who wants a quick start) of being very much shorter. The present book of Libermann and Marle, which is based on courses given to graduate students at the University of Paris VI and VII, is very similar in level and