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Foundations of mechanics, Second Edition, Revised and enlarged, by Ralph Abraham and Jerrold E. Marsden, The Benjamin/Cummings Publishing Company, Reading, Mass., 1978, xxii + 806 pp., $39.50.

1. This excellent book is one of several superb books on mechanics which have appeared in the past decade, such as those of Souriau [**10**], Siegel-Moser [**9**], Arnold [**2**] and Thirring [**13**], indicating a revitalized interest in the venerable subject of classical mechanics. Actually, there have been at least three sources of revitalization in the past forty years. The first came from the solution of the "small divisor problem" in celestial mechanics. The breakthrough here was achieved by Siegel in a mathematical tour de force, and then a new powerful general principle was discovered by Kolmogorov and developed in the hands of Arnold and Moser into a major analytical tool. The second came from the study of geometric properties of mappings and flows, especially in their "generic" behavior. The guiding philosophy had come from the foundational work in differential topology of Whitney and Thom, and was developed by Smale, Anosov, Sinai and their schools. More recently, there has been an influx of new ideas coming from group theory, from the work of Kirilov and Kostant in representation theory, and of Souriau, in rethinking the physical and geometrical principles underlying mechanics. As the bulk of the material added in the second edition deals with this last topic, I will concentrate my attention on it.

Much, but not enough, has been written about the philosophical problems