the brief article on the subject, then read the related articles in the encyclopedia that are cited, and finally proceed to any of the references. Or one can quit at any level. The book is an open-ended invitation to a self-paced course in any and all of physics.

Of course, the level of articles can be uneven, and the amount of background necessary to understand the articles can be problematic. Thus, to read the article on currents in particle theory, one needs to know basic ideas of electromagnetic theory as well as the meaning of such terms as "vector bosons" and "color symmetry groups"—which send the reader to the exploration of other articles.

Who can use such an encyclopedia with profit? Any practicing physicist who needs to know a little (or a lot) more about a new field or a field of physics that is new to him or her. Any other scientist or engineer who can find it useful to get a taste of any subject in physics and a little of its vocabulary. The same usefulness, perhaps slightly reduced, is available to physics and nonphysics college and university students. The rest of the world takes its chances, just as it does on the science articles in the *Encyclopedia Britannica*.

Rita Lerner and George Trigg are to be commended for organizing such an able team of physicists, cajoling them into writing the articles, and then producing the finished product within a time span that does not render the publication hopelessly obsolete.

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Sophie Germain: An Essay in the History of Elasticity

L. Bucciarelli, N. Dworsky
147 pp. Reidel, Dordrecht, Holland, 1980. $30.00

Sophie Germain, a French woman mathematician of the early nineteenth century, is remembered in the history of science for her contributions to the theory of numbers and to the theory of elasticity. In many respects she was a remarkable figure: Self-educated and excluded from official institutional acceptance by her sex, she struggled to assert herself during one of the most exciting periods in the history of French science. The book under review, a collaborative effort by Louis L. Bucciarelli and Nancy Dworsky, examines Germain's research in the theory of elasticity and the context of this research within French mathematical physics of the period. The authors describe the intended audience of their book as "students and scholars in the history of science, applied mechanics, mechanical and civil engineering. It will also be of interest to those people concerned with women's studies."

Germain: a sketch of the mathematician from Stupuy that appears in the book reviewed.

The authors focus on Germain's research on the vibrations of thin elastic plates. In 1809 the French Academy of Sciences had announced a prize of 3000 francs to anyone who could provide a mathematical description of this phenomenon and indicate how it agreed with the empirical evidence. The setting of such prizes was a traditional method in France of stimulating scientific accomplishment. This particular competition was a response to a visit to Paris in 1808 by the German physicist Ernst Chladni, who had exhibited the striking patterns formed by sand scattering on vibrating glass or metal plates. The competition was reset twice, the only submission each time being Germain's, until she finally succeeded in winning the prize in 1816. She continued to work on the problem of elastic surfaces until her death in 1831.

The authors chronicle Germain's successive attempts at formulating a mathematically sound description of the vibrating plate. A central argument of the book is that the opposition to her work stemmed in part from the basic hypothesis with which she began her investigation. French mathematical physics in the early nineteenth century was dominated by the view that all terrestrial phenomena could be explained in terms of short-range forces acting between molecules. This view was championed by Simon de Laplace, the leading French scientist of the period, and was also vigorously advocated by Siméon Poisson in his work on elasticity. Germain's hypothesis, however, required no special assumptions about the underlying physical mechanism. In addition, she employed techniques of analysis developed by the French mathematician Louis Lagrange, techniques that were rejected by Poisson.

Sophie Germain: An Essay in the History of Elasticity is an interesting

and important study of the struggles of an individual woman to gain recognition for her scientific work. The authors' contention that Germain encountered opposition from the school of Laplace and Poisson because of her choice of mathematical technique is provocative and would have benefited from a more detailed description of the technique she did employ, namely, the variational method of Louis Lagrange.

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Review of L. Bucciarelli and N. Dworsky's *Sophie Germain: An Essay in the History of Elasticity*. Dordrecht, Holland; Boston: D. Reidel Pub. Co.; Hingham, MA. 1980. In Physics Today 34, 7, 60 (1981)