

as to the training of students in another land and to learn to appreciate the Latin mind. Here the lesson is rich and the knowledge it imparts adds to the stature of a human being. One might add that the lesson is never learned, being too extensive. We look forward to the appearance of volumes 2 and 3, which we are certain will reveal once more all the personal warmth and all the pedagogical cunning of these two authors.

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*Mathematical aspects of the quantum theory of fields.* By K. O. Friedrichs. New York, Interscience, 1953. 8+272 pp. \$5.00.

Attempting a mathematical treatment of quantum fields may be a bit like trying to run a cross-country mile in 4 minutes. One of the main obstacles is the psychological one arising from the prevailing opinion that it can't really be done. This book is one of the first serious attempts to get in training for a successful run, and is the only one of such scope. A number of shorter stretches are run in good enough time to be encouraging, and some of the longer practice runs show interesting technique and suggest novel possibilities. If at times the pace slows down almost to a fast walk and if not all of the mile is covered, the degree of success is still greater than one had a right to expect at this stage of the enterprise.

The subject does not at present admit a systematic or rigorous presentation. To a considerable extent it is not even so much a subject in the mathematical sense as a set of techniques for dealing with specific problems with various elements in common. The most incisive of these techniques, and in particular the renormalization approach developed within the past ten years, look just as firmly mathematically unrigorizable now as did the theory of *interacting* quantum fields when it was initiated over 25 years ago. It is even a significant accomplishment to present, as this book does, a quasi-rigorous treatment of selected parts of the theory of an individual quantum field.

The material is presented in a relatively mathematical language and style. It is thereby more readable for most mathematicians than most of the corresponding articles in the physical literature, even if definitions and statements are not always mathematically precise and if proofs of some of the more technical statements are omitted. The author apparently intends to give a more mathematical description to some of the simpler parts of the existing theory, and the only substantial really novel feature is the treatment of quantum statistics. The basic annihilation and creation operators of conventional physics exist only in a formal sense, but smoothed-out versions of them can be