leveled at the author's desire to straddle both the transfer function and the differential equation aspects of the reactor control system, as a result of which the treatment is not always completely satisfactory from either aspect. However, taken as a whole the book should be an excellent and useful addition to the science of nuclear engineering.

Measurements of Mind and Matter. By G. W. Scott Blair. 115 pp. Philosophical Library, Inc., New York, 1956. $4.50. *Reviewed by R. B. Lindsay, Brown University.*

This little book by the well-known chemist and rheologist explores some fundamental questions regarding measurement in both physical science and psychology. In it he reviews some ideas about the theory of dimensions of measured quantities which he has previously developed in connection with his own rheological investigations. Much has been written on dimensional analysis by a great many distinguished scientists and scarcely any field of physics has aroused more controversy. The author, having been often faced in his researches with the necessity of directly comparing different physical properties of substances which behave like solids on one time scale and liquids on another, has lost his reverence for the classic principle of dimensional homogeneity. He believes that there should be some way of associating directly and quantitatively viscosity and elastic modulus in the sense, to put it crudely, one might like to say that so many apples are equivalent to so many oranges. Most physicists have fought shy of trying to build theories involving such equations, even though analyses of this sort are common in every day life.

Mr. Scott Blair discusses clearly and entertainingly his theory of what he calls quasi-properties, necessary in the making of dimensionally heterogeneous comparisons. Numerous illustrations are presented, particularly from psychology, and an interesting relation is developed to the Gestalt idea. The first four chapters provide a very simple presentation of the standard theory of physical measurement which any college student of elementary physics could read with ease and profit. The rest of the discussion is much more subtle and will undoubtedly provoke strong differences of opinion. We should, however, be very grateful to the author for providing this interesting and well-written resumé of his views.

Power Reactors. Vol. 3 of the Peaceful Uses of Atomic Energy; Proceedings of the International Conference in Geneva, Aug. 1955. 389 pp. (UN) Columbia U. Press, New York, 1956. $7.50. *Reviewed by L. B. Borst, New York University.*

This is an encyclopedia of reactor technology as seen in 1955. Numerous reactors (both real and imaginary) are described in almost complete detail.

Perhaps the most striking contribution is the exten-

sive description of the USSR Power Station. It is reported to have been in operation by mid-1954, and to have operated as a normal part of the utility grid. The development program shows remarkable similarity to the program in the United States. The principal exception is the fuel element which is not completely described.

Performance tests have justified projection of this 5000 kw plant to a 100 000 kw plant now being designed for construction. Present power costs from fossil fuels are 10 kopeks per kwh. Projected costs for the new plant are 10–20 kopeks per kwh.

In a field which has confronted the dual criteria of national interest and economics we now learn the basis for the divergent national development programs. The United States development revolves about enriched uranium as a fuel. Canadian, British, French, and Norwegian developments are based on natural uranium with plans for future plutonium fuel sources. The Russian program implies separation of both U-235 and deuterium and appears to be as broad but less advanced than that in the United States. The differing costs and availability of power in the various countries lead to divergent economic evaluations. In all cases power costs from reactors is projected at or slightly above power from fossil fuels. The most significant variable, however, is the interest rate paid on the required capital cost. There appears to be little concurrence on a reasonable interest rate.

A most instructive feature of the *Proceedings* is to be found in the discussion at the end of each group of papers. The nature and origin of the questions as well as the answers give unusual insight into the viewpoint of each national program.

A useful appendix tabulates published data on operating reactors throughout the world.

Physical Mathematics. By Chester H. Page. 329 pp. D. Van Nostrand Co., Inc., Princeton, N. J., 1955. $6.00. *Reviewed by Philip M. Morse, Massachusetts Institute of Technology.*

The present fashion in texts on mathematical physics is to accentuate the integral, derogate the differential. There are many reasons: integrals enter naturally when dealing with averages and probabilities; integration improves convergence and smooths out discontinuities; the Fourier integral corresponds to a sort of frequency analysis of physical behavior which it is now possible to duplicate experimentally by electronic means; and so on.

The text here reviewed is no exception. The differential operators Δ^2, grad., etc., are defined in terms of limiting ratios of integrals. The wave and the Helmholtz equation are also discussed in terms of their integral equation counterparts and their related variational principles. Eigenfunctions are introduced via the variational principle, and several chapters are devoted to a discussion of the techniques of solution of integral equations.

The book is clearly written, with sufficient number of references to bolster those passages where the author