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 cannot go into detail. Thus it should be a very useful secondary text, to give the student an alternative point of view, or a book to read when reviewing the subject.

In order to compress the subject into 329 pages, the author has had to omit sets of problems and has had to emphasize only one aspect of the whole field. He has chosen to concentrate on the aspects of forced motion important in electric circuit and communications problems, at the expense of those aspects more useful in field theory and quantum mechanics. His chapters on Fourier and Laplace transforms, transient analysis, and difference equations are excellent and go into more detail than was possible in the rest of the book. Except for the disadvantage of the lack of problems, this book would be well worth considering as a text for a course in mathematical methods given to engineers or applied physicists. The index is a bit brief.

Science and Information Theory. By Leon Brillouin. 320 pp. Academic Press Inc., New York, 1956. $6.80. *Reviewed by R. W. Hellwarth, Hughes Aircraft Company.*

Information theory has become, in the words of Shannon, "something of a scientific bandwagon" onto which investigators in all reaches of science have jumped. Brillouin in *Science and Information Theory* has judiciously confined his subject matter to the major accomplishments in the purely objective statistical theory which have arisen from Shannon's investigations, and the implications of this work to the physical sciences through the thermodynamical or entropy interpretation of information.

The book is intended for those at the graduate engineering or physics level and requires of the reader only familiar mathematical tools and basic physics. It is quite self contained with numerous "asides" and proofs on such topics as Fourier analysis, thermodynamics, and simple quantum physics as each is needed in the course of an argument. As it is then, the book is of lesser interest to the mathematician or advanced investigator, as it chooses not to develop the hard core of information theory as an essentially deductive mathematical system.

About half the book is devoted to the telecommunications applications of the theory: definitions, coding, channel capacity, errors, redundancy, language, reading, and writing. The remainder develops the entropy (or "negentropy") principle of information, which is formulated in thermodynamic terms as a generalized Carnot principle. All sections abound with worked-out problems and numerical examples. Many practical results of the latter section often do not seem to justify the effort to derive them since they are either physically insignificant or are available to ordinary calculation. However, Brillouin properly reminds the reader that most of the real value of the new theory lies as yet undiscovered, and the informational discussions of such things as measurements, errors, statistical mechanics, and noise theory serve (a) to further understanding of