The arrangement makes it particularly easy to find information on β decay and to note genetic relationships. The inclusion of a line showing the course of the bottom of the potential valley makes for quick orientation as regards β energetics. Fission yields for the slow neutron fission of U^{235} which are given at the tops of the relevant chains show at a glance the importance of the chain in a thermal reactor.

It is possible to note quickly all the activities that will result from slow neutron irradiation of any natural element or artificially produced collection of isotopes and from the information given directly on the chart to calculate the relative amounts of such activities that will be produced.

The two main needs of the reactor scientist or engineer are thus admirably taken care of. But there are many other uses for the chart such as identification of possible products from charged particle nuclear reactions, the tracing of α decay chains, the study of relationships among natural abundances, etc.

The print is large and clear. The only real criticism of this reviewer is the policy adopted for isomers. In many cases γ-emitting states whose half-lives are of the order of 10^{-9} seconds, are treated as "isomeric" states and allotted separate areas of one of the hexagons. This treatment seems to result in undue cluttering and in the creation of false impressions. A policy of adopting a lower limit, say a second, below which half-lives would not be treated as "isomeric" might be preferable. It is also a little surprising to see C^{12}, for instance, allotted an "isomeric" state with an "instantaneous" half-life for decay into three alpha particles.

The general impression, however, is that of a job most carefully and conscientiously done. This second edition of the Sullivan chart at a modest price is a tool for which any one concerned with nuclear physics or chemistry will find daily uses.

The Hypercircle in Mathematical Physics: A Method for the Approximate Solution of Boundary Value Problems. By J. L. Synge. 424 pp. Cambridge U. Press, New York, 1957. $13.50. *Reviewed by W. C. Rheinboldt, National Bureau of Standards.*

The book describes the so called hypercircle method, invented by the author, together with W. Prager, and shows its applicability by means of many examples. Up to now this method is to be found only in original publications and it is therefore very commendable that this interesting technique in the theory of boundary value problems of partial differential equations is now available in the form of a textbook.

The method is based on the fact that often the solution of a boundary value problem, regarded as a point in function space, is the intersection of two orthogonal linear subspaces. Having selected a finite number of points in both subspaces one can define a hypercircle on which the solution is located. This provides bounds for the solution, and furthermore if the radius of the hypercircle is small any point on it is a good approximation to the solution. Thus the method is of interest both from a theoretical and an applied viewpoint. In general no limiting process is used so that the actual application of the method involves essentially only the solution of systems of linear equations.

The book is written mainly for mathematical physicists and engineers. Therefore the author tried to require no special knowledge beyond calculus. Yet I think this should also include some basic knowledge about boundary value problems in mathematical physics and a certain ability to understand new mathematical ideas. The book is written with a wonderful didactic skill. Interesting in this respect is the consistent use the author makes of the pictorial representation of function space as a heuristic tool of suggestion and explanation. Naturally the book is not intended to be an introduction to functional analysis and hence it does not present the theory of abstract function space with all its axiomatics. Yet the whole treatment is mathematically exact throughout.

The book it divided into three parts entitled "no metric", "positive-definite metric", and "indefinite metric".

Part 1 consists only of Chapter 1 and presents an introduction to the theory of function space without a metric.

Part 2 starts with Chapter 2. Here the author introduces first the idea of a metric; and then, restricting himself for the rest of this part to the case of a positive-definite metric, he defines the concepts of length and angle, orthonormality, hyperplanes, hyperspheres, and hypercircles. Finally the general idea of the hypercircle method is developed.

In Chapter 3 the theory is applied to the Dirichlet problem for a finite domain in the Euclidean plane. This is the simplest and most important application of the method and therefore a thorough treatment of the case is given.

In Chapter 4 the method is applied in detail to the problem of torsion of an elastic cylinder. It was in connection with this problem that the method was originally developed.

In Chapter 5 the applicability of the method to other boundary value problems especially those that correspond to a variational principle is shown. As examples the viscous flow in a channel, the membrane with elastic support, the problem of equilibrium of an elastic body, and the biharmonic equation are discussed.

Part 3 of the book starts with Chapter 6; the geometry of function space with an indefinite metric is explained and the concept of null-vectors, orthogonality, hyperplanes, pseudo-hyperspheres, and pseudo-hypercircles are given. Here the method is no longer as good a guide for approximate solutions and bounds as it was in the case of a positive-definite metric. Yet in the case of a Minkowsky-metric one can get a certain basis for approximations.

In Chapter 7 these concepts are applied to vibration problems, especially scalar vibrations, elastic and electromagnetic vibrations.