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cal harmonic expansion methods. The discussion of reactor physics which follows is limited almost exclusively to the specific design of graphite moderated, gas cooled, natural uranium reactors which are now being built in the United Kingdom and the calculation of criticality is accompanied by a detailed numerical example which is based on the BEPO reactor. A short introduction to reactor kinetics, shielding, radiation detection, and radiation damage in solids rounds out the survey.

As a short general introduction to the subject for engineering courses, the book should prove quite useful, but the text that will present reactor physics in what Dr. Alvin Weinberg has called "the scholarly tradition" has not yet appeared.

Relativity: the Special Theory. By J. L. Synge. 450 pp. (North-Holland, Holland) Interscience Publishers, Inc., New York, 1956. \$10.50. Reviewed by P. M. Morse, Massachusetts Institute of Technology.

It is interesting to compare this volume with Panofsky and Phillips' *Classical Electricity and Magnetism*, for the two are mutually complementary. Panofsky and Phillips are physicists, and while they do not discuss the experimental basis of their subject, their exposition exhibits the inductive slant that is so necessary for an experimental science. The point of view in Synge's book is deductive, on the other hand. It starts with a definition of distances and coordinates in space-time, in terms of clocks and light beams, and from these, by theorems and geometric reasoning, deduces the Lorentz transformation and its consequences. Panofsky and Phillips start with electromagnetic theory, bring in special relativity as an analytic consequence of the Maxwell equations and direct their exposition toward the quantum theory; Synge starts with the geometry of the Lorentz rotation in space-time, brings in electromagnetism as an interesting application and directs his exposition toward general relativity and cosmology. Both points of view merit the attention of the student.

This reviewer found the thoroughgoing use of geometric reasoning in Synge's book both interesting and helpful. Of ten chapters the first four are concerned with the Lorentz rotation and its geometrical implications. The general space-time rotation is carefully analyzed into elementary space and time rotations and the representation of these rotations by means of spinors is discussed in some detail.

In the fifth chapter the connection between this space-time geometry and physical phenomena is first introduced, with a discussion of the Doppler effect, the effect on light of moving media, and the connection between red-shift and the expanding universe. The sixth chapter deals with the mechanics of a particle and with the relativistic aspects of the various collision phenomena encountered in nuclear physics. The seventh chapter treats systems of particles, angular momentum, and the two-body problem in special relativity.

The seventh chapter, a long one, contains a more

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readable discussion of the special relativity of continuous media than the reviewer has found elsewhere. The stress-energy tensor is introduced, its principal axes are found, the equations of motion of the medium are set up and the meaning of pressure and incompressibility is discussed. One who has mastered this chapter should have no particular difficulty in understanding recent theories of cosmology.

The last two chapters deal with classical electromagnetic theory in its relativistic form. Here again the treatment is axiomatic and geometrical, as contrasted with the analytic and inductive approach of Panofsky and Phillips. The field tensors and the energy tensors are set up, the principal axes of the energy tensor are determined and the Poynting vector and the potentials are derived. A short discussion of various types of fields and of the field around a moving charge completes the main part of the text. There are appendices on the radiation from an accelerated charge, on retarded potentials, a list of references, and a quite adequate index. There are no exercises.

The Foreseeable Future. By Sir George Thomson. 166 pp. Cambridge U. Press, New York, 1955. \$2.50. Reviewed by P. Morrison, Cornell University.

The physicist is a kind of specialist in innovation. Change in means and in concept is his daily expectation. But he is very well aware that the world is far from haphazard, that the more things change, the more they must remain the same. It was Edward Condon who told the congressman that even the most radically inclined of skeptics in physics held fast to some notions now two thousand years old, and never called them into question. His example was Archimedes' Principle! It is his understanding of the firm framework of the world, matched with the willingness to let the façade and the furnishings change freely, that makes a reflective physicist a good architect for planning any technical future.

Sir George has been willing to let us in on his own sketches for the shape of things to come in the next hundred years. In a chatty, unpretentious, and concise way, he has here produced a kind of operational research into the probable state of the world, chiefly of course its technical state, projected a century ahead. The arguments are made carefully, but in a most elementary style, explaining the invariant principles upon which they are founded in a wholly nontechnical but still roughly quantitative way. The result is a short book which is both a highly plausible prophecy and a model of the order-of-magnitude reasoning of the imaginative physicist at work. It is a book of wide general interest for what it says, and of special value to the young student of physics for how and why it says it.

In a neat statement of what he considers the fundamentals of our knowledge of the world (the First and Second Laws, the replicated atomicity of all matter, and so on) Sir George lays down a nice extrapolation in fields as diverse as fuel and materials, communications and food, medicine and learning theory. The book is so