electrodynamics *in vacuo*; 7. waves; 8. relativistic mechanics of continuous matter; appendix, tensors for special relativity. Some omitted topics: variational principles for Maxwell's equations and other field theories, and the relation between Lorentz invariance of the action and the existence of conservation laws; spinors and the structure of the Lorentz group. There is a good collection of interesting and stimulating exercises, many with hints and answers. There remains one puzzling question: Why should a book, priced at 10s.6d in Great Britain, be priced at \$2.25 in the U.S.?

ALFRED SCHILD

Seminar on transformation groups. By A. Borel with contributions by G. Bredon, E. E. Floyd, D. Montgomery and R. Palais. Annals of Mathematics Studies no. 46. Princeton University Press, 1960. 245 pp. \$4.50.

A topological transformation group is a triple (G, X, π) consisting of a topological group G, a space X, and a map $\pi: G\times X\rightarrow X$ such that $\pi(e, x)=x$ for all $x\in X$ and e the identity of G and such that $\pi(g_1, \pi(g_2, x))=\pi(g_1, g_2, x)$ for all g_1, g_2 in G and $x\in X$. It is customary to omit π and write (G, X) and $\pi(g, x)=gx$. We may regard G as represented as a group of homeomorphisms of X onto itself. In this manner we might regard (G, X) as an extension of the concept of linear (matrix) representations. It is also convenient to regard transformation groups as a generalization of principal fibre bundles. This latter interpretation is suggested by the introduction of the orbit space $X|G$ and the quotient map $\nu: X\rightarrow X|G$.

In this Annals Studies the group G is taken to be a compact Lie group (possibly finite) and various conditions are imposed on X. Two of the main questions that can be pursued for transformation groups concern the nature of the fixed point set; that is, the set of points in X such that $gx=x$ for all $g\in G$, and the structure of the orbit space, $X|G$. There are, of course, many other interesting questions, and we have mentioned these two only to give us a start.

The first two chapters deal with generalized manifolds and, in themselves, have no relation to transformation groups. The basic idea, exploited so extensively by Wilder, is to extract certain local and global properties from locally euclidean spaces which can be expressed purely in terms of algebraic topology and to show that when these properties are imposed on an abstract space then the space, again from the point of view of algebraic topology, will exhibit the characteristics of a locally euclidean space. The idea is to impose "local" conditions and then to derive "global" results; for example,