$$p_n(x) = \frac{1}{w(x)} \frac{d^n}{dx^n} [w(x)X^n]$$

holds, where the function w and the polynomial X are independent of n. The differential equations satisfied by the classical orthogonal polynomials follow.

In Chapter V the properties of the classical orthogonal polynomials on finite intervals are developed. There is some introductory work on the gamma function, on hypergeometric functions, and on confluent hypergeometric functions. Then follow the properties of Jacobi, ultraspherical, Chebychev, and Legendre polynomials. In connection with the latter, Legendre functions are discussed also for general values of the parameters. The detailed study, both in this chapter and in Chapter VI, of the analytic behaviour of the classical orthogonal polynomials, in particular of their zeros and their asymptotic behaviour, may be especially noted here.

In Chapter VI, the classical orthogonal polynomials for unbounded intervals, that is the Laguerre and Hermite polynomials are presented, the presentation including a proof of the completeness of these polynomial systems. The book concludes with a discussion of the convergence properties of expansions in classical orthogonal polynomials.

Throughout the work examples enliven the presentation, and at the end there is a very useful table of the various constants associated with the classical orthogonal polynomials as well as a bibliography. All in all a worthy addition to the series of books written by the author—and also to the "yellow series."

A. Erdélyi

Special relativity. By W. Rindler. Oliver and Boyd and Interscience Publishers, Inc., 1960. 10+186 pp. $2.25.

This small book gives an excellent, clear, and concise account of special relativity. There is a sound balance between physical ideas, analytical formulae, and space-time geometry. In a short treatment the author cannot satisfy all tastes and must make a selection of topics. The reviewer would have preferred a greater emphasis on space-time geometry, but this is a matter of personal predilection. He is in complete agreement with the choice of topics. These are perhaps best indicated by enumerating the chapter headings: 1. the special principle of relativity; 2. relativistic kinematics; 3. relativistic optics; 4. space-time; 5. relativistic mechanics of mass points; 6. relativistic 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 $\pi: G\times X\to X$ 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 $\nu: X\to X|G$.

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,