Computations are made for the cyclic groups and some results about the transfer homomorphism obtained.

Chapter 6 deals with the reduced pth powers for odd primes p. Results analogous to those of the first two chapters are proved for the Steenrod algebra $\mathcal{A}(p)$ and applications given, including the result that the p-primary component of $\pi_i(S^3)$ is zero for $i<2p$ and Z_p for $i=2p$.

The next two chapters are devoted to the construction of the reduced powers, the verification of the axioms and the uniqueness theorem. Briefly, the construction is as follows. Let K be a complex, π a subgroup of the symmetric group $\mathcal{S}(n)$ on n letters, and W a π-free acyclic complex. If $K^n=K\times K\times \cdots \times K$ (n factors), π acts on $W\times K^n$ by the diagonal action and we denote the quotient by $W\times_\pi K^n$. Now, if u is a cohomology class on K and $u^n=u\times \cdots \times u$ the n-fold external product of u on K^n, we can, under suitable circumstances, extend u^n in a natural way to a class Pu on $W\times_\pi K^n$. Letting $d\colon K\to K^n$ be the diagonal map, we have a map $1\times_\pi d\colon W\times_\pi K = W/\pi\times K\to W\times_\pi K^n$ and an induced map $(1\times_\pi d)^*\colon H^*(W/\pi\times K) \to H^*(W\times_\pi K^n)$. If the coefficient domain is a field, $H^*(W/\pi\times K) \approx H^*(W/\pi)\otimes H^*(K)$ and we define the set of reduced powers of u to be the elements u_i of $H^*(K)$ where $(1\times_\pi d)^*Pu=\sum v_i\otimes u_i \in H^*(W/\pi)\otimes H^*(K)$. In particular, the Steenrod reduced pth powers are obtained when π is the cyclic group of $\mathcal{S}(p)$ generated by the unique p-cycle.

The concluding chapter of the book is an appendix by D. B. A. Epstein in which purely algebraic derivations are given for some properties of the Steenrod algebra which previously had mixed geometric-algebraic derivations.

The book is extremely well written and the choice of material excellent. The prerequisites have been kept at a minimum so that only a first course in algebraic topology is required. It certainly would be a valuable addition to the library of any topologist and, in fact, to any library already having the introductory books in algebraic topology.

R. H. SZCZARBA

Differential forms with applications to the physical sciences. (Mathematics in science and engineering, vol. 11, ed. by R. Bellman.) By Harley Flanders. Academic Press, New York, 1963. 12+203 pp. \$7.50.

This is a remarkable book, presenting the fundamental ideas of the geometry of manifolds in a robust, unpedantic and clear manner; in