[(5), 9.]	$r \dashv s . = .i$	(6)
[(4), (6)]	$p \dashv q . = .r \dashv s$	(7)
[11.03]	(7) = (1)(2)	(8)
[(7), (8)]	(1)(2)	(9)
[11.2]	(1)(2) $\dashv$ (1)	(10)
[12.17]	(1)(2) $\dashv$ (2)	(11)
[(9), (10)]	(1)	
[(9), (11)]	(2) .	

The paradox stated above is a particular case of Theorem 10, and therefore requires no further proof.

NATIONAL WU-HAN UNIVERSITY,
WUCHANG, CHINA

THE BETTI NUMBERS OF CYCLIC PRODUCTS

BY R. J. WALKER

1. *Introduction.* In a recent paper† M. Richardson has discussed the symmetric product of a simplicial complex and has obtained explicit formulas for the Betti numbers of the two- and three-fold products. Acting on a suggestion of Lefschetz, we define a more general type of topological product and apply Richardson's methods to compute the Betti numbers of a certain one of these, the "cyclic" product.

2. *Basis for m-Cycles of General Products.* Let S be a topological space and G a group of permutations on the numbers $1, \cdots, n$. The *product of S with respect to G*, $G(S)$, is the set of all n-tuples $(P_1, \cdots, P_n)$ of points of S, where $(P_{i_1}, \cdots, P_{i_n})$ is to be regarded as identical with $(P_1, \cdots, P_n)$ if and only if the permutation $\binom{1 \cdots n}{i_1 \cdots i_n}$ is an element of G. A neighborhood of $(P_1, \cdots, P_n)$ is the set of all points $(Q_1, \cdots, Q_n)$ for which Q_i belongs to a fixed neighborhood of P_i. It is not difficult to verify that the

† M. Richardson, *On the homology characters of symmetric products*, Duke Mathematical Journal, vol. 1 (1935), pp. 50–69. We shall refer to this paper as R.