

ON SOME CONTRIBUTIONS OF KAROL BORSUK TO HOMOTOPY THEORY

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Dedicated to the memory of Karol Borsuk, a great topologist and a dear friend.

Introduction

So many and varied are the contributions of Karol Borsuk to topology in general and to homotopy theory in particular that it would be idle to attempt a global view in the space of a brief memoir.¹ I have therefore chosen to be highly selective, and discuss only two of his major contributions, each selected for a special attribute it possesses. First, I cite his invention of the *cohomotopy groups*. Of course Borsuk introduced them to analyse a topological problem—he was never a formalist. But it is important to remember that Borsuk was not an algebraic topologist and thus was not in the mainstream of development of algebraic topology; moreover, his circumstances at the time of this work (just before World War II) made it even more difficult for him to remain in even indirect contact with other topologists in Western Europe and the United States. Nevertheless, he invented a notion which, as I show, fitted into the mainstream of homotopy theory and made an essential contribution to its progress. Once the Borsuk cohomotopy groups are recognized as special but important cases of stable track groups, the full force of the apparatus of modern algebraic topology (exact sequences, functoriality, spectral sequences, . . .) can be brought to bear on them automatically. That recognition owes much to the excellent account provided by Spanier [9]

¹In any case, I would expect that other aspects of his immense contributions would feature in other articles in this volume.