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COMPACT HILBERT CUBE MANIFOLDS AND THE INVARIANCE OF WHITEHEAD TORSION

BY T. A. CHAPMAN[1]

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ABSTRACT. In this note we prove that every compact metric manifold modeled on the Hilbert cube Q is homeomorphic to $|K| \times Q$, for some finite simplicial complex K. We also announce an affirmative answer to the question concerning the topological invariance of Whitehead torsion for compact, connected CW-complexes. As a corollary of this latter result it follows that two compact Hilbert cube manifolds are homeomorphic iff their associated polyhedra (in the sense above) have the same simple homotopy type.

1. **Introduction.** In this note we announce some recent results on infinite-dimensional manifolds which imply, among other things, the topological invariance of Whitehead torsion for compact connected CW-complexes.

A *Hilbert cube manifold* (or Q-manifold) is a separable metric space which has an open cover by sets which are homeomorphic to open subsets of the Hilbert cube Q. We say that a Q-manifold X can be *triangulated* (or is *triangulable*) provided that X is homeomorphic ($\cong$) to $|K| \times Q$, for some countable locally-finite simplicial complex K. In [**5**] it was shown that (1) any open subset of Q is triangulable, and (2) if X is any Q-manifold, then $X \times [0, 1)$ is openly embeddable in Q and thus is triangulable (where $[0, 1)$ is the half-open interval). We refer the reader to [**4**] for a list of earlier results on Q-manifolds. In this note, based on results in [**6**], we prove that every compact Q-manifold can be triangulated. The triangulation of non-compact Q-manifolds is much more delicate and is expected to be the subject of a future paper.

TRIANGULATION THEOREM. *Every compact Q-manifold can be triangulated.*

Using a result of West [**13**] it follows that if K is any finite simplicial complex, then $|K| \times Q \cong M \times Q$, for some finite-dimensional combinatorial manifold M. In this sense it follows that all compact Q-manifolds can be *combinatorially* triangulated.

COROLLARY 1. *Every compact Q-manifold can be combinatorially triangulated.*

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