

## CHAPTER VII

### Cohomology superstructures

#### 7.1. Introduction.

#### 7.2. Our view on K theory.

#### 7.3. Generalised Steenrod squares.

The work by Steenrod which introduced the Steenrod squares is contingent on the research of José Adem. The properties of Steenrod squares are the building blocks on which is based the proof given by Jack F. Adams on the nonexistence of elements of Hopf invariant one, which claims to show that the only division algebras stop at dimension 8, the octonions. We have found in volume I, chapter IV, counterexamples to this claim, given by the vulcannions. It is interesting to ask, therefore, where this proof fails. Our initial suspicion is that, although the work of J. F. Adams is highly complex, the underlying philosophy of the method of its proof is simple, and so we must turn our attention on the Adem relations in homotopy theory.

#### 7.4. Characteristic classes.

#### 7.5. Étale cohomology.

#### 7.6. Crystalline cohomology.

#### 7.7. Some comments on motivic cohomology.