

25 Oct 79

"A Modern Odassey" or "The elementary subHopf algebras of any finite subHopf algebra B_* of $A(2)$ detect the non-nilpotent cohomology classes of B_* ."

N.B. The following fragment of a manuscript, reproduced verbatim, was found etched on the side of a Klein bottle recovered from the stream Yvette. One possible interpolation of the fragment will be offered at a later date.

Clarence Wilkerson **

There was once a young man who basked on the beaches of a warm tropical sea. One day an enormous tidal wave swept the young man off his feet and swirled him every which way (indeed, friends were heard to remark that only a natural agency of great force could have budged the young man). This was of small comfort to the young man; year after year the wave would land him on some sandy atoll or Artic iceberg, only to return him later to the sea.

Years passed before a friendly zephyr guided him into a secluded cove. All was well then for the man, no-longer so young and now quite rounded by the years of rubbing against other denizens of the sea. The sun shone brightly, the air was crisp and the evening sky was filled with stars. Children gathered about him to learn of finite H-spaces and the calculus. Letters from an accomplished miller on a northern isle provided pungent food for thought.

But one day the gentle zephyr returned with an insistent message: "Go west, no-longer-young man. On the shores of an inland sea you will find a passage to the mysteries of stable homotopy theory. There will be friendly guides who see far but speak another tongue. Perservere. Beware, for the passage lies in the shadow of a great A.S.S. The A.S.S. is now old and somewhat abused. Moreover, he is now incontinent, so beware the odd p."

** partially supported by the NSF, but please don't tell.

The no-longer-young man went west and indeed found the friendly guides. The tongue was strange, but each guide gave what he could, for the giving of gifts was a great local custom. Soon the man's pack was filled with Hopf algebras, cobar constructions, Steenrod operations, Noetherian rings and more.

When the day to leave came he protested that it was really too much to carry. However the path pointed downhill toward the lake of cohomology of Hopf algebras, so with a gentle push from the guides, he departed. That evening, he dozed on the shore as a fog rolled over the lake. The gentle zephyr came with the fog, and whispered in his ear: "You can't go wrong generalizing theorems about p -groups to finite Hopf algebras. In particular, it should be elementary to detect non-nilpotent cohomology classes."

When he awoke, at his feet were tattered copies of Milnor-Moore, Hopf Invariant One, and a rather slippery set of waterwings fashioned from a lemma of Serre and a note of Quillen-Venkov. The zephyr had always been a true friend in the past, and the intent was clear, so he strapped on the waterwings and plunged into the still chilly lake. By sheer luck and brute force, it seemed at first that he would soon reach the opposite shore.

It was not to be. The lemma of Serre slipped from his grasp, forced away by $\tilde{P}^0 \neq \text{Id}$. It was only a lemma, but without it he swam in rapidly narrowing circles. With incipient horror he saw that he had created a whirlpool (rotating counter example-wise of course). A dazzling white lifepreserver floated to his hand, pushed by the gentle zephyr, but it was too late. He and the life preserver were sucked down a drain and propelled rapidly back to the great inland sea. Struggling ashore he realized that the promised vistas had not been so grand, and even the life preserver that had seemed so clean and bright was in fact well-used. On the reverse side, it read "If found please return to W.H. Lin, 1977."

At this very moment of revelation, he found himself surrounded by the friendly guides. After some initial confusion, he perceived that a gift was expected from him. Having no theorems of his own, he could only offer the life preserver of Lin. The head guide frowned and spoke: "Somehow I remember a longer line of proof on this lifesaver. But at least you avoided the odd p."

*written on the occasion of a fall at Northwester
Oct 22, 1979*