Corollary: mod p,

a) $H(\Omega^2 S^{2n+1}) = \mathrm{Cotor}^{\Omega S^{2n+1}}(R, R)$

as <u>Hopf algebras</u> BUT

b) $H(\Omega^2 S^{2n+1}) = \mathrm{Cotor}^{P[z_{2n}]}(R, R)$

as <u>algebras</u>, maybe not

as Hopf algebras

(in fact, b) is true as Hopf algebras!)

and a) and b) are true as <u>algebras</u>

<u>over</u> <u>any</u> <u>R</u>

<u>Step 3</u> mod p, $P = P[z] = P[z_{2n}] =$

$P_0 \otimes P_1 \otimes P_2 \otimes \cdots$ as <u>coalgebras</u>, <u>not</u> <u>as</u>

<u>algebras</u>, where $P_k = \langle 1, y_k, \ldots, y_k^{p-1} \rangle$,

$\underline{y_k} = z^{p^k}$, $\Delta(y_k) = y_k \otimes 1 + 1 \otimes y_k$

Proof: The coalgebra isomorphism is

$\Theta : P_0 \otimes P_1 \otimes \cdots \longrightarrow P$ with

$\Theta(y_0^{a_0} \otimes y_1^{a_1} \otimes \cdots) = z^{a_0 + a_1 p + \cdots}$,

$0 \le a_i < p$.