On Isotope Shifts LARRY ZAMICK, Rutgers University — It was noted by Zamick (Ann.Phys66,784(1971) That the same formula used by Talmi and De Shalit for binding energies (Rev.Mod.Phys.34, 704 (1962)) could also be used for nuclear radii i.e. isotope shifts. The argument is simple-both the radius operator and nuclear interaction are scalars under rotation. The formula has the change of square radius relative to a reference as nC+ (n(n-1)/2)A +[n/2]B. There have been many experimental papers which discuss this work as well as associated work by Talmi(NPA 423,189 (1984).The formula was originally used for the Calcium isotopes but most recently for Argon isotopes (K.Blaum et.al. NPA 799,30(2008)).There was also work on the Bismus and Lead Isotopes by M.R. Pearson et.al. (J.Phys G.26,1829(2000)). The formula displays even-odd staggering for both binding energies and nuclear radii.Sheline et.al. discuss "inverse staggering" as possibly evidence of Octupole deformation for certain Barium and Cesium isotopes (PRC38,2952(1988)). Other work of note is due to H.D. Wohlfahrt PRC 23,533(1981). It is my feeling that the above and other experimental results are somewhat scattered and it would be useful to collect them all and have a unified discussion of the implications of these very interesting experiments not only with the above formula but with other theoretical formulations.

Larryl Zamick
Rutgers University