a guide in assigning the ground-state configuration and possible low-lying excited-state configurations just as Fig. 1-6 may be used in atomic physics. The spacings of the levels on this diagram should not be regarded

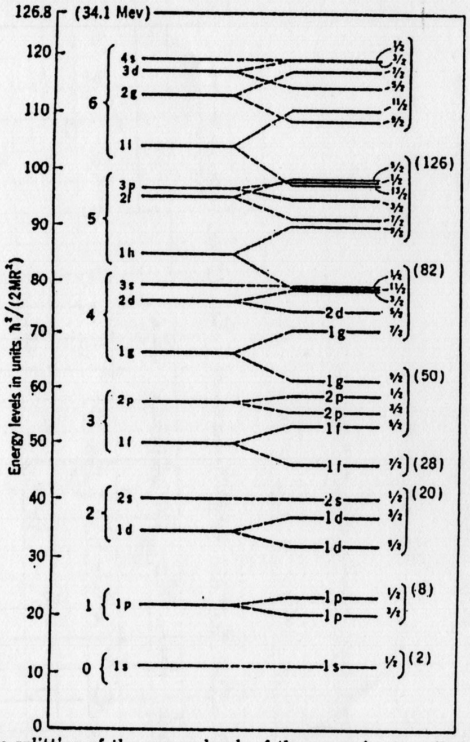

FIG. 11-8 The splitting of the energy levels of the approximate well of Eq. (11-42) because of the phenomenological spin-orbit coupling [Eq. (11-41)]. The brackets at the left indicate the levels that are degenerate in the oscillator potential. The numbers at the right are the magic numbers which correspond to the number of neutrons and protons that completely fill all the preceding levels. (*From Malenka, Ref.* 17.)

very literally, nor, in view of the effects discussed in the next section, should the specific order of competing orbitals be regarded as significant.

11-6. Nuclear Angular Momenta. If an extreme one-particle model is successful, we may expect that only the nucleons in a given nucleus which are outside closed shells will contribute to the total nuclear angular

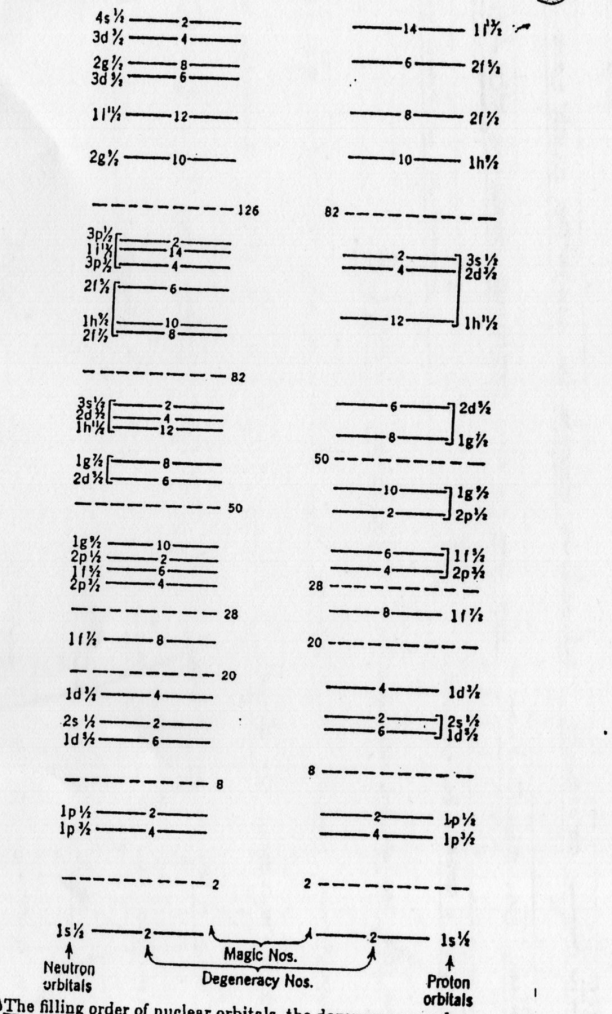

FIG. 11-9 The filling order of nuclear orbitals, the degeneracy numbers, and the magic numbers of the nuclear periodic table. The neutron orbitals follow approximately the level assignments of Klinkenberg (see Ref. 20). The proton orbitals are positioned in relation to the neutron orbitals so as to include schematically the effects of the coulomb interactions.