We often say in our research group that all of our quantum mechanics textbooks are dog-eared and coffee-stained. In the spirit of Prof. Worthey’s undergraduate-introductory-physics colloquium, I would like to extend the discussion to include undergraduate quantum mechanics: the fundamental relationship between energy and frequency, selection rules, fine-, hyperfine-, and Zeeman splittings, and simple Hamiltonians that can be solved analytically. The playground for this discussion is the world of alkali-metal atoms, which have both a long history and a tremendous breadth of physics associated with them, including atom trapping, Bose-Einstein and Fermi condensation, sensitive detection of electromagnetic fields, the study of quantum chaos, and my personal favorite, optical pumping. Our discussion will touch on how angular momentum in light can create highly (non-equilibrium) polarized ensembles of alkali-metal atoms, how these atoms can be used as clocks, why physicists like to count things, and how to image lungs. The group’s latest results include a comparison study of important optical pumping characteristics of Rb and Cs, both of which can be used to produce hyperpolarized 129Xe, which is the signal source for magnetic resonance imaging of the lung.