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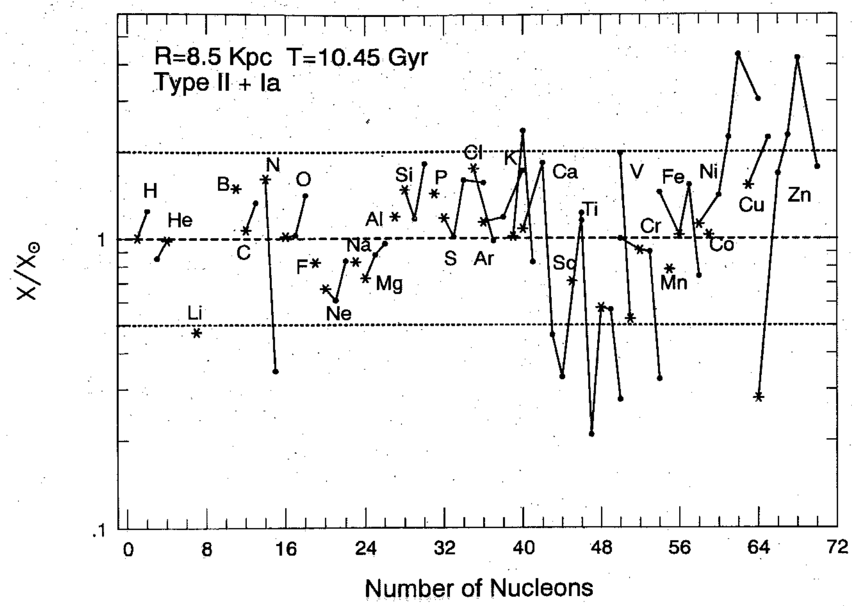
Within the notion that there are scientific families that parallel personal families, this photograph always puts a smile on my face. For then this picture shows my great-grandfather, my grandfather, and my father, along with several uncles: Uncle Ray, Uncle Mike, and Uncle Syd. I take some of my fashion tips from Grandpa there, and Pop is looking pretty cool in his black Levis.

I wasn't one of William Fowler's graduate



Recent models of the chemical evolution of stars have calculated the abundances of stable isotopes from hydrogen to zinc, trying to show that, after many rounds of star formation, this process will eventually reproduce the sun's known composition. The y-axis here gives the calculated abundance divided by the measured solar abundance. The most abundant isotope is marked by an asterisk, and isotopes of the same element are connected by solid lines. If this calculated stellar composition were the same as the sun's, the isotopes would all lie on the horizontal dashed line. They do, however, replicate solar composition within a factor of two, represented by the horizontal dashed lines.

students or postdocs, and yet I consider Dr. Fowler to be one of the most important influences upon my scientific life. For without the sustained advice, unwavering support, and friendship of his students and collaborators, much, if not all, of the nuclear astrophysics that I am involved in would simply not exist as it does in its present form. I am highly appreciative, and greatly indebted.

Since my principal connection with Willy is through his science, I would like to spend a few moments on one aspect of that relationship.

Burbidge, Burbidge, Fowler, and Hoyle composed a broad and compelling paradigm of how the elements are synthesized in stars. They identified the various processes that operate in stellar interiors, and predicted the chief nucleosynthetic products from the major nuclear burning stages. Some of the details have changed, especially in the light of new physics that was unknown in the late 1950s. For example, scattering by intermediate vector bosons gives rise to neutral currents, which add a source of neutrino cooling. This cooling affects the core structure of a massive star, which in turn determines, to some extent, the detailed nucleosynthesis. Burbidge et al. and Cameron posed the following very important question: can the nucleosynthesis that takes place in stars and is forcefully ejected, eventually, after many rounds of star formation, reproduce the measured solar composition? I wish to briefly address this question.

By the mid 1980s various groups had run detailed nuclear reaction networks on specific stages of stellar evolution: core silicon burning, shell oxygen burning, and neutron capture reaction sites to name just a few. These specific studies suggested that a sizable portion of the solar composition could be synthesized. Supernova 1987A arrived and offered several observational tests of stellar evolution and nucleosynthesis, along with providing a few unexpected features. In the early 1990s the index *n* in Moore's Law (computer speed doubles and price halves every 18 months) had become significant enough to allow the routine use of detailed nuclear reaction networks in very finely gridded stellar evolution models. Coupled with an increase in our knowledge of the physical and evolutionary properties of our galaxy, the question posed by Burbidge et al. began receiving fresh attention.

The graph at left shows an example from the results of these recent stellar-chemical evolution studies. In terms of absolute solar abundances, the stable isotopes from hydrogen to zinc range over some 10 orders of magnitude. There are many uncertainties that affect the spread and pattern in the figure, for example: the treatment of convection, residual disagreement on key nuclear reaction rates, functional form of the star formation rate, and even the measured abundances themselves. Certainly this graph does not represent the final answer, nor the first, but it is very encouraging that the isotopic solar composition from hydrogen to zinc is replicated to within a factor of two.

Willy played a central role in this calculation— directly, by his compilations of the necessary nuclear reaction rates, and indirectly by training and motivating his students, grandstudents, and great-grand-students. I think a reasonably correct calculation of the isotopic solar composition is a beautiful example of the adventure associated with connecting nuclear physics to astronomy. It is very exciting, and an honor, to assist in propelling the science which Willy had such a profound influence on into the next millenia. □

{The "family" photograph on the opposite page was taken by David Arnett in front of The Green Man pub in Grantchester, England, at lunchtime, ca. 1971. From left to right: Syd Falk, Kem Hainebach, Mike Howard, Stan Woosley (identified as Pop in the text), Ray Talbot, F. C. Michel (Caltech BS '55, PhD '62), Cliff Morris, Don Clayton (MS '59, PhD '62; identified as Grandpa in the text), and Willy Fowler.}