U. H. Uus. *The Appearance of Elements Synthesized in the Interior of a Star on Its Surface.* Stars with low surface temperatures and large radii—the red giants—often have anomalous surface chemical composition because these stars have thick convection envelopes that support the transport of nuclear combustion products

from the interior of the star through the entire envelope all the way out to the star's surface. Theoretical calculations indicate that in certain red giants, the outer convective zone may at all times include part of the internal region in which nuclear combustion occurs. In such cases, all of the matter of the star's envelope participates in the nuclear reactions, since convection mixes the envelope matter very efficiently.

The possibility of constant thorough mixing arises in stars with masses of approximately 4 to 8 sun masses during the growth stage of the degenerate carbon-oxygen core. The chemical-composition changes produced in the envelope by the penetration of convection into the hydrogen nuclear combustion layer consist in successive establishment of carbon, nitrogen, and oxygen isotope concentration ratios that are equilibrium ratios with respect to the carbon cycle of hydrogen combustion, beginning with the isotopes having the shortest lifetimes, and in a certain increase in the helium content. Only the carbon content fails to reach equilibrium during the growth of the star's core.

Unfortunately, it was not possible to determine the exact extent of mixing theoretically, since the inadequate development of statistical fluid mechanics made it necessary to use a rather crude treatment of the turbulent convection in modeling the structure of the convective regions of stars.

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