In April-May of 2004, the Chandra X-ray Satellite observed the Cassiopeia-A supernova remnant for a total of 1 million seconds (a Chandra VLP; Very Large Project). The resulting deep exposure allows us to extract spectra of high signal/noise from small spatial regions of the remnant, exploiting the unprecedented angular resolution of the Chandra mirrors to the full. I will describe how this, combined with a novel modeling approach, allows us to make quantitative inferences about the elemental composition in the remnant, and its spatial distribution, in order to compare with predictions of nucleosynthesis for core-collapse supernovae. Time permitting, I will also touch on other features of the supernova remnant; the jets and the natal kick imparted to the compact central object, in an attempt to build a more complete picture of the supernova explosion and its relationship to more recently observed core-collapse supernovae.