The present investigation started from a suggestion by J.D.H. Donnay to reconsider an almost hundred year old problem of the non-applicability of the Law of Rational Indices to crystal growth forms of calaverite. That was recognized by Goldschmidt et al. and a precise determination of the modulation wave vector \( \mathbf{q} \). The basic structure, a deformed CdI\(_2\) type, was determined by Tunell and Pauling (Acta Cryst. 2 1952, 375). In 1979 Sueno (Hawaii AIP Conf. Proc., 55, 333) recognized the incommensurately modulated character of the structure. That was confirmed in 1983 by electron diffraction (Tendeloo et al., J. Sol. St. Chem. 50 1985, 321). We determined the crystal structure of natural (Cripple Creek, Colorado) calaverite at 296 K and at 100 K. The superspace group is \( \text{P6}_3/m\text{mc}(\text{P6}_3\text{mc}) \) with \( a=0.4908 \) and \( c=0.448 \) for the modulation wave vector \( \mathbf{q} \), in excellent agreement with the morphological results. All parameters (modulation wave to third order) were refined with Yamamoto’s (Acta Cryst. A 38 1982, 67) program. Overall it for 1899 (2008) reflections of which about 2/3 are satellites is 4.6% (4.3%). The values at 100 K are in parentheses. Modulation parameters hardly vary with temperature. The largest modulation occurs for \( \gamma(\text{Te}) \). The infinite Te chains of the basic structure along \( b \) are now disrupted. Binding distances vary as well. The figure displays, as a function of \( t = (x=+0.31, y=0, z=0.29) \) with \( \mathbf{q} = (0,0,0) \), the respective regions I and II, respectively. This strongly resembles the situation in sylvanite where \( \text{Ag}^+ \) (\( \text{d}^10 \) configuration) is linearly and \( \text{Au}^3+ \) (\( \text{d}^8 \)) is square coordinated. For calaverite we therefore observe a modulated valence state for \( \text{Te} \) in regions I and II, respectively. This interpretation is reinforced when considering the occupation modulation of the \( \text{Ag} \) fraction at \( \text{Au}^3+ \) positions in calaverite. The tellurium (its polarizability and electronic band structure) certainly plays a role as well as driving force for the modulation.