1037-11-159 **G. Griffith (Griff) Elder*** (elder@unomaha.edu), Department of Mathematics, University of Nebraska at Omaha, Omaha, NE 68182-0243. *Valuation criterion for normal basis generators and Galois scaffolding in local fields.*

The Normal Basis Theorem states that in a finite Galois extension there are elements, normal basis generators, whose conjugates provide a basis for the field extension. In the setting of local field extensions, it is natural to ask about the valuations of these elements: Is there a valuation (an integer certificate) that guarantees that any element bearing this valuation is a normal basis generator? Moreover, is there a variation of the normal basis that allows the valuation of any element expressed in the basis to be easily determined? Note that normal bases and power bases (polynomial bases) in a prime element are two common bases. The first allows the Galois action to be easily followed. The second allows the valuation to be easily determined. These two properties are in tension, which has stymied the subject of integral Galois module structure. We will discuss the two questions above, and illustrate the utility of their answers with some results in Galois module structure. (Received January 31, 2008)