1135-03-2   **John Stillwell*** (`stillwell@usfca.edu`). *The Brouwer Fixed Point Theorem.* Preliminary report.

The Brouwer fixed point theorem is a fundamental theorem of topology, which underlies theorems ranging from Brouwer's theorem on the invariance of dimension to the Nash equilibrium theorem. So, not surprisingly, various proofs of it have been proposed.

This talk will discuss some of the proofs, with particular attention to the proof of Sperner 1928, which is in a certain sense the most elementary possible. The amount of "nonconstructivity" required to prove the theorem is of interest because Brouwer himself rejected the theorem when he lectured on intuitionism in Berlin in 1927.

The recent development of reverse mathematics has identified the so-called "weak Kőnig lemma" as the essential nonconstructive ingredient in the proof of the Brouwer fixed point theorem. This development puts us in a better position to understand, for example, why the fixed point theorem is easier in dimension 1 than in higher dimensions. (Received September 06, 2017)