Kathryn L. Nyman and Francis Edward Su* (su@math.hmc.edu), Department of Mathematics, Harvey Mudd College, 301 Platt Blvd, Claremont, CA 91711. A Borsuk-Ulam equivalent that directly implies Sperner’s Lemma.

We show that Fan’s 1952 lemma on labelled triangulations of the $n$-sphere with $n+1$ labels is equivalent to the Borsuk-Ulam theorem. Moreover, unlike other Borsuk-Ulam equivalents, this lemma directly implies Sperner’s Lemma, so this proof may be regarded as a combinatorial version of the fact that the Borsuk-Ulam theorem implies the Brouwer fixed point theorem, or that the Lusternik- Schnirelmann-Borsuk theorem implies the KKM lemma. (Received September 25, 2012)