1116-03-1281 **Ovidiu Costin*** (costin.9@osu.edu), Math Tower, 231 W 18th Ave, Columbus, OH 43210, and **Philip Ehrlich** and **Harvey M Friedman**. *Integration on the Surreals: A Conjecture of Conway, Kruskal and Norton.*

A longstanding aim has been to develop analysis on the system **No** of *surreal numbers* as a powerful extension of ordinary analysis on $\mathbb{R}$. This entails finding a natural way of extending important functions $f : \mathbb{R} \to \mathbb{R}$ to functions $f^* : \mathbf{No} \to \mathbf{No}$, and naturally defining integration on the f^*. In this work the authors address this and related unresolved issues with positive and negative results. In the positive direction, we show that semi-algebraic, semi-analytic, analytic, meromorphic, Borel summable or more generally Écalle-Borel transseriable functions at $+\infty$ extend naturally, and an integral with good properties exists on them. In the negative direction, we show there is a fundamental set-theoretic obstruction to naturally extending (a fortiori integrating) many larger families of functions including entire ones with rapid decay at $+\infty$. (Received September 18, 2015)