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**Philip Ehrlich\*** (ehrlich@ohio.edu), Ohio University, Department of Philosophy, Ellis Hall 202, Athens, OH 45701, and **Ovidiu Costin** 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  $f : \mathbb{R} \rightarrow \mathbb{R}$  to functions  $f^* : \mathbf{No} \rightarrow \mathbf{No}$ , 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 21, 2015)