

Drake's Equation from a Paleobiological Perspective

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The Drake Equation is the central tenet of the SETI program; it was proposed by the astronomer Dr. Frank Drake (Green Bank Conference, 1961) as a tool for estimating the number of advanced civilizations in the Milky Way Galaxy. Although its mathematical form is quite forward, the Drake Equation rests upon an eclectic mix of astronomical and biological data, and on a set of assumptions about the nature of biological evolution and of “intelligence”, which are problematic when we view them in the context of our current understanding of evolutionary theory. These problematic aspects of the Drake Equation put serious constraints on it as a legitimate tool for statistically gauging the number of “advanced civilizations” in the Milky Way Galaxy. We present a careful analysis of each of the major assumptions on which the Drake Equation is based (especially its tacit adherence to the idea of the directionality of the evolutionary process), discussing the constraints each of them places on the validity of the equation. To achieve this goal we use a two-fold methodology: 1) we directly examine the scientific merit of these assumptions from the point of view of our current paleobiological understanding, and 2) we expose Drake's Equation as a scientific hypothesis to Karl Popper's demarcation test of falsifiability to establish whether it is a scientific hypothesis.