

Editorial – Reworking Drake

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Adam Frank and Woodruff Sullivan, in a recent article in *Astrobiology* (DOI: 10.1089/ast.2015.1418), have derived a new version of the Drake equation, which changes the question asked from: how many technological civilizations exist *now* in the universe, to: how many technological civilizations have *ever* existed in the universe. To do so, they have reworked the original equation so as to isolate the famous factor f_l (the probability that a habitable zone planet develops life) as well as two other equally unknowable factors f_i and f_t (the probability that a planet with life develops intelligence, and the probability that a planet with intelligent life develops technology, respectively). Thus:

$$A = [N_* f_p n_p] [f_l f_i f_t]$$

becomes $A = N_{ast} f_{bt}$

This is convenient, of course, since the unknowable parts of the original Drake equation can be approximated by some guess work. The conclusion can be stated as follows:

“Only if f_{bt} falls as low as 2.5×10^{-24} to 2.5×10^{-22} is it likely that no other technological species has ever arisen in the entire Universe.” All stated with proper scientific caution. However, The New York Times on 10 June carried an opinion piece in the Sunday Review, written by Adam Frank, entitled “Yes, There Have Been Aliens,” in which the caution has become somewhat more understated. Frank states: ...while we do not know if any advanced extraterrestrial civilizations currently exist in our galaxy, we now have enough information to conclude that they almost certainly existed at some point in cosmic history.” The increasing number of discoveries of extrasolar planets has certainly “changed the game” to some extent. But one wonders if our optimism should become so inflated as long as research in life’s origins has not yet been able to establish a convincing prebiotic and truly plausible scenario for the synthesis of the first RNA molecules. What is the value of f_l ? The debate is open again - submit your manuscripts now.

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