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EVOLUTION AND HISTORY IN A NEW "MATHEMATICAL SETI" MODEL

Abstract

In his new book entitled "Mathematical SETI" (ref. [1]) this author introduced several new mathematical models for SETI:

1) Darwinian evolution theory may be regarded as a part of SETI theory in that the factor fl in the Drake equation represents the fraction of planets suitable for life on which life actually arose. In a previous paper (ref. [2]) it was shown that the exponential growth of the number of species typical of Darwinian Evolution may be regarded as the geometric locus of the peaks of a one-parameter family of lognormal distributions constrained between the time axis and the exponential growth curve. The mathematical way is paved to further cast Darwinian Evolution into a mathematical theory in agreement with both its typical exponential growth in the number of living species and the Statistical Drake Equation.

2) The lifespan of a living being, let it be a cell, an animal, a human, a historic human society, or even an ET society, was mathematically described by this author in ref. [1] as a finite b-lognormal. This is a lognormal probability distribution starting at a certain time (b = birth), growing up to adolescence (a = adolescence time = the b-lognormal's ascending inflexion point), reaching the peak (p = peak time = the b-lognormal's peak abscissa), then going on to senility (s = senility time = the b-lognormal's descending inflexion point) and finally reaching death (d = death time = the intercept between the b-lognormal's axis at senility and the time axis). This author then analyzed mathematically the historical development of eight human historic civilizations. The conclusion is that all these b-lognormals also reveal to have an exponential envelope similar to the Darwinian evolution envelope.

Thus, this "Exponential Envelope Law" seems to be a universal growth trend, applicable to ETs also.

REFERENCES

[1] C. Maccone, "Mathematical SETI", a 700-pages book in press by Springer-Praxis books in Astronomy and Planetary Sciences, ISBN 978-3-642-27437-7, e-ISBN ISBN 978-3-642-27437-4, DOI 10.1007/978-3-642-27437-4, © Springer-Verlag Berlin Heidelberg 2012.

[2] C. Maccone, "A Mathematical Model for Evolution and SETI", Origins of Life and Evolution of Biospheres (OLEB), 2012, in press.