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UFO UpDates Mailing List

Re: Drake's Equation

From: **Greg Sandow** <GSANDOW@prodigy.net>
Date: Sat, 04 Jan 1997 16:10:52 -0500
Fwd Date: Sun, 05 Jan 1997 04:33:33 -0500
Subject: Re: Drake's Equation

Stan Friedman wrote:

> > Re: The Drake Equation, it should be noted that it
> > totally ignores colonization and migration, the 2
> > major factors in determining the distribution of
> > intelligent life on earth.

> > Stan Friedman

To which Ed Stewart replied:

> A note to the nuclear physicists, consultants and conspiracy theorists
> on this list regarding basic math and its application to the Drake
> equation:

> The Drake equation starts with a total possible population: i.e., the
> number of stars in our galaxy. That number is well established. It also
> includes the estimated average number that can develop life in star
> systems that have developed planets. That number is not well
> established. Those are the only numbers that are greater than one in the
> entire application of the Drake equation. The remaining factors are
> stated in terms of percentages and/or probabilities. In the mathematical
> world of probabilities, the highest number is 1, or 100%.

> Each time that a factor is introduced into the Drake equation, unless
> the factor produces a probability of 1, that factor erodes away from the
> total population. It never "adds" to it. The introduction of "new"
> factors into the Drake equation will automatically make the outcome
> smaller, or at best not change the result in the case of a probability
> of 1. Under no circumstances does the outcome increase.

> The Drake equation addresses the question: How many technological
> civilizations are out there that have achieved the capability to
> communicate? Nothing more, nothing less. Nevertheless, if one would wish
> to ask the question as to how many of those technological civilizations
> could actually have achieved a capability level to colonize and migrate,
> that probability would be less than 1, or less than 100%, which means
> that the number would always be less than whatever the number arrived at
> by application of the Drake equation.

> Sorry to disillusion the nuclear physicists, consultants and conspiracy
> theorists on this list, but I felt the need to remind all of some very
> basic math principles that have apparently been overlooked in the
> application of conspiracy theories to the Drake equation.

>

Ed, I'm not a nuclear physicist or a conspiracy theorist, but you may have misunderstood Stan's point.

Clearly, each term Drake introduced into his equation lowers the number of civilizations that might be found. That's because of the elementary math you referred to. You take the total population of stars, subtract those that don't have planets, subtract those with planets that can't support life, subtract those on which intelligent life never developed ...and so on.

But what Stan meant, I believe, is that civilizations that colonize or migrate create <new> civilizations, and therefore raise the total number.

You'd apply his thought as follows. Plug numbers into the Drake Equation. Subtract, from the total population of stars, all the limiting factors, those I've mentioned plus others (civilizations that never develop high technology, those that destroy themselves, and so on). At the end of your calculations, you arrive at a number: The total number of intelligent technological civilizations in the galaxy.

Now you estimate what percentage of them engage in colonization or migration. Obviously -- elementary math again, not to mention common sense -- this gives you an even smaller number. Not all intelligent technological civilizations might colonize or migrate. But that's not the reason for estimating this number.

You want to know how many civilizations colonize or migrate because each has the potential to create one or more new civilizations. So now you need to estimate how many new civilizations each traveling or migrating race might create, multiply by the number of colonizing or migrating races, and add that number to the total.

Not, in my opinion, that these numbers mean much. The whole thing strikes me as desperately unknowable. How many civilizations simply spread, without losing track of their branches, so that these branches become fresh civilizations in their own right? How many colonies suppress native intelligent life? These things, to put it mildly, are hard to estimate, especially in the absence of any data at all.

Still, Stan has a point, looking at the proposition theoretically. The Drake Equation might well underestimate the number of civilizations, because each traveling race might engender additional civilizations of its own.

Drake would presumably reject that thought, I should note -- since he thinks interstellar travel is impossible. In his view, nobody colonizes or migrates.

Greg Sandow

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