Equations

By Woody Schneider

--The following is an excerpt from the personal correspondence of Dr. Elian Fillmore. It was compiled to include pertinent information for scientists who wish to continue the research of recently deceased doctor Marshall Imptor. --

March 5th

Dr. Imptor,

I am quite certain that further experimentation will be needed. But at this point we've been able to resolve the image to a reasonable resolution (3 +/- .5 arcsec). And so far all the data collected from the contact plate agrees with the parallel specimen array. This was, of course to be expected, but still we are quite glad to finally get (what I would say) is solid confirmation that the equations will one day lead to a definitive model of the event.

It is with such long awaited and joyous news, that I leave this, my greatest work, to you.

Perhaps you have heard of the dreams. Certainly, I have had them myself. And, I am sad to say, if you are worth the money it took to educate you, you'll be having them also in no time. But they are rather benign early on.

I trust you were given some introduction to the work we've been doing here, so I won't belabor the trivial things. Essentially it is only a matter of further refining the equations, so as to embody a unique and extrapolative theorem which explains all singularities yet encountered.

No doubt such useless words bore you. And I am in no position to waste time. So, let us begin. I hope this briefing is helpful.

> Assertion I: The wave pattern of any arbitrarily chosen particle[1] from a living (sentient[2]) subject, when superimposed upon the mean frequency of those adjacent will always have a predictable set of interference patterns when viewed in any one arbitrary dimension. The characteristic interactions are illustrated here:

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[1] I use the term *particle* somewhat loosely here. We assume essentially limitless subdivision of the medium, which means regardless of where one chooses to cease the process of subdivision (assuming it is continued until quantum superposition effects dominate), the elements one is left to manipulate will be termed *particles*. All such elements follow the assertions of this briefing.

[2] Perhaps the most important factor in assertion I is the fact that this relation requires a sentient subject. Similar data have been taken from particles existing within arbitrary pieces of matter, including specimens of non-living organic matter. In these cases a completely different relation was discovered.

$$\Psi_{\Psi_0+\int\Phi} = \left\{ \int_V \left(\sum_{0\to\infty}^{n} \sqrt{\frac{\sum a^2}{n}} \hat{n} \right) dV \times \Xi(q_n, \Psi_0) \right\} \bullet \Xi(q_1, q_2 .. q_n, \Psi_0)$$

This equation shows the sum of the rms[3] value for each adjacent particle. Of course these may only influence the target particle, possessing wave function, Ψ_0, in the direction of a line connecting the two, as is scaled here by the cross product with the normal, $\hat{n}$ (being, of course, also the direction of wave propagation). The sum of these (including all cancellations) is a good enough estimate of the net pattern felt by the particle at Ψ_0. And all interactions must be scaled by the Ξ function[4], which accounts for the super-positions of all possible outcomes. In testing of this model, we performed calculations using up to 5th order outcomes[5]. For almost all cases the theory continues to predict results within calculated error.

> Assertion II: Particles existing within non-sentient matter do not experience a detailed superposition and, therefore, do not possess a predictable interference pattern.

> Assertion III: Given Assertion II, particles which satisfy the special case of Assertion I must differ from other particles in a definite way, specifically,

$$\Psi_0 \propto \Xi(q_1, q_2 .. q_n, \Psi_0) \sqrt{ds \hat{q}_n}$$

As assertion III suggests, wave function of the particle itself is proportional to the Ξ function for that particle scaled by the distance, ds, to the next particle as measured independently in each coordinate. The most obvious problem with this equation has been termed the "recursion singularity." This refers to the fact that Ψ_0 is proportional to a function which depends on Ψ_0 itself. If Ψ_0 behaves in such a matter, than the actual driving force for the particles wave function must come from elsewhere. Where this is, we have of yet no idea. But we can derive the Ξ function for a given particle given some information about the situation as a whole.

> Assertion IV: The Ξ function is

$$\Xi(q_1, q_2 .. q_n, \Psi_0) = \sum_{1\to\infty}^{n} \frac{\left(\rho_\alpha + \rho_\beta + \rho_\gamma\right)}{\partial\Psi_0 / \partial q_n} \hat{q}_n$$

Condensed here into it's most simply written differential form, we may envision Ξ as the vector sum of 3 densities, $\left(\rho_\alpha + \rho_\beta + \rho_\gamma\right)$, per unit rate at which Ψ_0 changes in a given direction. In our search for physical manifestation of each density,

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[3] This is known as the root mean square amplitude, or the rms amplitude: $rms = \sqrt{\frac{\sum a^2}{n}}$. For *n* individually measured *a* amplitudes. Hopefully such procedures are already quite familiar to you.

[4] We see much reliance on the as of yet, un-introduced Ξ function here. It is derived in Assertion IV. However, for the purposes of this expression, it may be treated like any arbitrary wave function.

[5] Quite naturally, this sentence should be, at first, puzzling. For how does one define an outcome, if any possible outcome must invariably give rise to more of it's kind? This refers to outcomes resulting from 4 previous outcomes, in other words, fifth generation outcomes.

a number of interesting correlations were found. Though, it must be stressed that an exact density can only be calculated for ρ_γ.

> Assertion V: ρ_γ may be consistently calculated to within error as equal to the respiration density[6] of the subject.
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> Assertion VI: ρ_β may be well approximated using a scaled measure of the energetic density integral[7] over the entire biomass.
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> Assertion VII: ρ_α may be the most singular and baffling density of the three. All attempts to produce an algorithm for ρ_α have been unacceptable. What is most certain is that, in the limit, it approaches infinite density [for a typical subject] it may be well approximated at zero[8]. Models using such approximations have most often performed within error.

As always, science will invariably invite more questions than it answers. And this, I am sure, has been a most adequate demonstration of such behavior. But with any luck, it will aid you in a continuing the research. I look forward to meeting you, though with any luck it will be some time before we are forced to do so. Until then I will remain

Respectfully Yours,

Dr. Elian Fillmore

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[6] This refers to the density of both cellular respiration and macro-organic respiration. As this would suggest, ρ_γ is always higher in multi-cellular organisms relative to single celled life forms and in the limit (death), collapses to zero.

[7] As of yet such a calculation may only be done in gross approximation. For most life forms in is merely a sum of individual contributions from mitocondriatic and photosynthetic activity. However, to ensure the closest agreement with experiment, the resultant number is scaled by $\sim\frac{\pi}{2}$. The reason for this factor of error is yet unknown, though it suggests a substantial source of energy produced elsewhere and in a more difficult to detect form.

[8] This approximations has been shown to fail for measurements taken within a .78 +/- .04 second radius of the end of organic activity, during which the entire Ξ function is unstable and has not yet been measured without prohibitive error.