



What's Life got to do with It

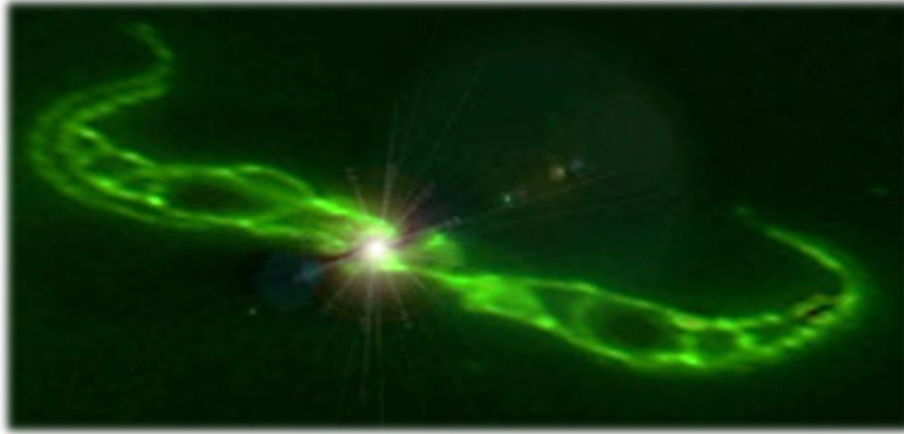
Tom Ransom

This remarkable miracle we call "life", insofar as the scientific evidence shows, got up and running as soon as possible, meaning—of course, the *potential* for life was here first. Gradually coalescing from the hot spin-offs of a condensing star, the Earth started out as a molten mass of mostly rock and heavy metal. As it cooled water began to accumulate. The water was coming from the frequent impacts of icy meteors, haphazard remnants of the early solar system, forever in pursuit of their gravitational center. In fact, we likely owe our very existence to having interrupted their annual transits of the Sun, for these ballistic intruders not only deposited water, infused within were a host of "organic" compounds.

Slowly rotating in the warm radiance of its parent star, fertilized with dirty ice raining from afar, the Earth was soon awash with all of life's requisite ingredients. And deep within these natural elements, in their innermost atomic arena, a dynamic affinity was in play: Matter was mixing it up. Matter spontaneously interacts because an "electrostatic" force *impels* it to do so. The negatively charged perimeter electrons of every atom are attracted to the positive nuclei of adjacent atoms and thus incessantly seek to close the distance. Atoms bond whenever together is more charge stable—closer to dynamic equilibrium, than is their separate adjacency. Because equilibrium is their preferred state, more stable means longer lasting. This intrinsic propensity for matter to persistently combine meant ordered complexity, of ever longer duration, whenever and wherever possible, was for certain. It was *supposed* to happen.

Thus, whenever conditions are favorable, by proximal necessity, the natural elements engage in chemical synthesis forming larger "molecular" compounds, which likewise attract and interact, forming ever more stable assemblies. Moreover, when compounding molecules interact, bonding energies are discharged and exchanged producing electrical pathways that further enhance polyreaction potentials. Induced to expand along their charge-gradients, these budding assemblies test every available adjacency, proceeding to expand, wherever possible, into regions of ever greater stability. And with every extension, as the topological complexity expands, so does their combinatorial range of bonding possibilities, exponentially. They *grow*.

What we find, then, is that ordinary matter spontaneously imports from *within* an intrinsic propensity to form ever more complex, durable arrangements. But there's more. Oily organics and water don't mix, they form autonomous "cells", within which these budding beginnings can become self-sustaining. And so it was, given a warm juicy planet hosting a growing number of possible combinations, just a matter of time before a miracle happened: Multiplication by division!



All that was required for cellular reproduction—the initiation of life, was the *division* of a self-sustaining, "autopoietic cell",⁽¹⁾ along a symmetrical axis, such that this divisibility is conserved in both. The now two resume growing, whereupon, as this fission axis reoccurs, the cycles of division are repeated. The world, however, is a dynamic tumbler, deviation and variation forces present at every stage of development, and only the most resilient replicate. It followed that those best able to reliably repeat—encode, their regenerative success, became the most prolific dividing multipliers. The Earth was populated by the most reproductive variations featuring the greatest "dynamic kinetic stability".⁽²⁾

Exponentially multiplying, mating and mutating, mixing it up, ever changing, these various autonomous life forms naturally began to differentiate from one another. Each evolving "species" became a veritable experiment testing its durability and powers of prolificacy. While most variations appeared briefly and faltered, the fittest remained, "selected" to continue its lineage. In conformal correspondence with its resource environment, leaving no opportunity untested, life proceeded to probe and occupy every habitable space. And with each new generation, as the competition for requisite resources became ever more challenging, the advantage soon went to those capable of consuming the acquired resources of *others*.

Now, recognizing that life selected to consume members of *itself* to advance its expansion, imports a profound implication. It means if any Grand design is professed to empower the synthesis of matter, and by extension the autopoietic processes of life, then it must be entirely indifferent regarding *which* of its members succeed. Each in every generation, even every species, survives only because it proves to be just as capable as the other competing candidates. This means that life isn't really about its members—us, at all. It's a *process*.

Inquire further and our comfort-zone sensibilities are soon challenged by an even greater apprehension. The cosmic and planetary contingencies that shaped the course of life on Earth have also been entirely indifferent—with regard to its very existence! Numerous cataclysmic volcanic and meteoric events, as evidenced in the sedimentary fossil records, have periodically reduced Earth's biological

complexity to its most primitive forms, erasing nearly all that natural selection had so laboriously produced. If the emergence of life on this most hospitable planet was a 'given'—supposed to happen, no certainty of success was granted. The implacable truth is that unconditional adversity, periodically and randomly applied, has been life's 'tool and die'.

So what are we left with? Everything! Apparently, billions of years of natural selection selected for *us*. We human beings represent the highest order of auto-poietic complexity on Earth because our species proved more capable and resourceful than any other. It wasn't because we were the biggest, strongest, fastest, or the most sensate; adaptation provided many other species with greater physical capabilities than ours. Nor did we reproduce fast enough to win over with numbers-of-kind like the microbes and insects did. The reason we out-performed all the other evolutionary candidates was because the nexus of our senses—our brain, multiplexed into a vastly superior processing organ.

It appears that well beyond the durable reproduction of biological complexity, even beyond the advance of sensate awareness, the processes of life have been selecting for *intelligence*. While all species acquired the intelligence required to respond to the challenges of their particular environments, our kind was on the fast-track to ever greater processing power. Humankind ascended because conscious cognition conferred upon our species the winning adaptive advantage.

From within the neural networks of our neo-cortex emerged the capacity to not just download observations into memory, but *reflect* upon them, finding patterns over time to fashion a comprehensive understanding of our world. This aptitude for "insight" made it possible to learn from past experience and project into the future, visualize various options, and reduce risk by planning in advance. We envisioned the manufacture of tools to shape our environment and designed instruments to enhance and extend our senses. Most importantly we developed symbolic language to convey and record what we learned. This knowledge network proved so successful one wonders if the emergence of intelligence on Earth might represent an even greater potential.



Have you ever observed a flock of birds and marveled at how they seemingly move as one 'super'organism? It appears our kind wasn't the only species to develop a demonstrative collective intelligence. In fact, long before we happened on the scene, animal herds, insect colonies, and even bacterial biofilms were engaged in collaborative behaviors that enhanced their mutual success. Indeed, this unitive "organizing principle"^(3,4) may be the defining impetus driving the evolution of life.

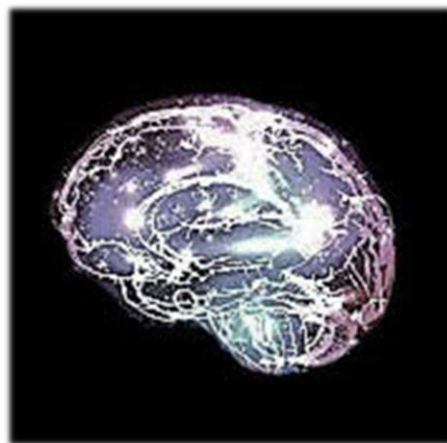
Such a unifying principle might suggest that "flocking" behaviors, like bird clusters, schools of fish, or animal stampedes, are somehow directed orchestrations, informed in some 'top-down' fashion. Slow motion analysis, however, reveals that nothing 'super'natural is involved. When slowed frame to frame these group expressions are seen to be the reactive recurrence of an *individual* input.⁽⁵⁾ Flocking behaviors manifest locally, bottom-up from within, when a single initiating action, the tip of a wing, the flick of a fin, or an animal's startle reflex, causes a wave of re-actions to radiate across the population.

As these propagating waves reinforce, resonate, and feedback on one another, second-generation harmonics are often produced that both amplify and modify the waveform. These are "emergent" expressions, coherent outcomes no longer attributable to any specific initial actions. What gives a flock its 'super'fluid appearance is that these secondary harmonics often propagate faster than the sum of the group's individual reaction times.⁽⁵⁾ Such group expressions, however, are *consequently* a synchronous collaboration. The illusion of a 'super'agency is just that. The initiating agency are those outstanding individuals comprising the group's "leading-edge".

The exceptional traits exhibited by these leading-edge agents are genetic endowments belonging to the group as a whole, inherited more or less by all, and effectively expressed in a normal "bell-curve" distribution. Change agents tend to be the most effective of the group because they are generally the most well endowed. In fact, every adaptive advantage, innovation, or new idea, was expressly introduced into the collective commons by an *exceptional* individual. Truly, the survival of our species is the cumulative result of *their* every success.

That successful group outcomes are the cumulative expression of individual successes is a life lesson that provides a reasoned and principled approach to matters of economics and governance. Policy intentions would focus on equality of opportunity, rather than outcomes, with the understanding that a variable outcome distribution is not only natural and nominal, but unavoidable—even necessary, in order for any success selecting evolutionary process to advance. It follows that meritocratic, free-enterprise societies amenable to the unencumbered success of the best among them, in every variety of productive endeavor, should over time prove the most prosperous for all. As the viability of a society is a function of the combined strength of all its members, strategies promoting personal initiative, resourcefulness, and responsibility benefit everyone.

In considering governance it suggests that *less* is better. It suggests that to the extent the natural auspices of life's evolutionary process are permitted to exercise freely, from the bottom-up, will citizens naturally become more capable. Government command and control interventions, implemented from the top-down, determine freedoms of function and redirect resources causing collateral cascades of unpredictable consequences. Those who advocate for ever more centralization entertain the belief that the prerogatives of a remote group of select representatives can pull the bureaucratic levers of regulatory redirection fast and smart enough to out-perform the natural expression of life's evolutionary endowment trust. The truth is, our future is being secured generation to generation as it always has been, by the innovative leading-edge of extraordinary individuals emerging naturally from *within* the elemental impetus of life itself.



We previously observed that beyond biological complexity, and sentient awareness, life has been selecting for intelligence.⁽⁶⁾ From charge-gradients in a cell to the alliance of cells in an organism, from ants in a termite mound to complex human civilizations, an intelligent organizing principle has defined life's leading-edge. Moreover, this propensity for intelligence is evidence to suggest that life may represent a teleologic potential, something greater—something Grand.

Which would explain why with the advance of intelligence emerged a curious tropism toward *comprehension* that began expanding the depth and breadth of our awareness. Well beyond necessity of survival, conscious awareness has evolved into an abstract domain where intangible images, thoughts, and ideas take form. This transformative transition from terrestrial adaptation to a 'meta'-physical world of mental imagery and symbolic reasoning enabled deliberative thinking and creative imagination. With the insight of our 'mind's eye' we're able to visualize subjects far beyond the scope of our immediate senses. It's where the boundless realms of mathematics, theoretical physics, and the arts find residence, as do the more introspective subjects of morality and meaning. Perhaps these noetic features should be considered part and parcel of a 'meta'-mind, the accrued entirety of the human cognitive enterprise, feeding back upon and exponentiating the evolution of each new generation of minds.

Just as biogenesis has direct attribution to an innate potential within matter itself, this propensity for comprehension may also have been imported from within. So why might an intrinsic inclination toward ever greater intelligence exist? Aside from the verity that it enhances survival, a Grand pretense to consider is were it not for the emergence of intelligent life, the Universe would never be *known* to exist.⁽⁷⁾ Conscious beings may be how the Universe is *realized*.

If so, we may be in for a modern '*pre-Copernican*' revival: The Earth *is* central. Rather than merely an insignificant planet adrift in an infinite vacuum of space, the emergence of conscious life may play an integral role in cosmic evolution. Rather than a random happenstance without direction, life in itself may know full well what it's up to. And if so, insofar as purpose and meaning are concerned, we'll do no better than learning to...

"dance with the one that brung us".



Less the leaves



More the tree



Less about us



The Big picture



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