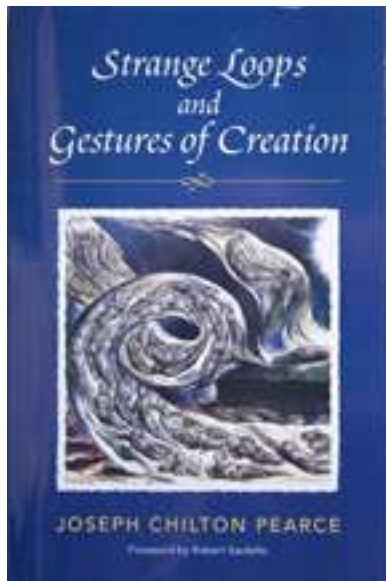


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Strange Loops
and Gestures of Creation

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Evolution, as a principle part of creation, is a force or impulse to overcome any limitation or constraint that might arise in created beings – such as us. Further, there is no evolution except *through* creation, and no creation except through evolution, and no life at all without both.

Back in the early half of the twentieth century, scientist Arthur Eddington pondered on how it was that this three or four pound clump of jelly in our skull could have discovered, come to understand, manipulate and even control so many secrets of the universe in so short a time as we have. Eddington mused that “Man’s Mind must be a mirror of the universe.”

Engrossed in writing my first book, *The Crack in the Cosmic Egg*, I was delighted with Eddington’s imagery, which verified a principal pillar of *Crack*, (begun in the late 1950’s). “Why of course!!” I mused in turn, as I worked out Eddington’s issue. “Man’s mind is a mirror of a universe *that mirrors Man’s mind.*” Each, I claimed, brings about and sustains the other.

Place two mirrors directly opposite each other, I suggested, and observe the “infinite regress” resulting, as the endless series of reflections unfold, stretching off toward an infinite nowhere point. To ask which mirror reflects first, giving rise to such replication regress, is as fruitless as the issue of mind and its reality. For there is no beginning or ending of such processes, nor the minds musing on them. Their reflecting beginning is in their reflecting ending and vice versa.

In spelling this out, I claimed that a scientist, in his passionate research leading to a great discovery out-there, has, unbeknownst to himself or his scientific community, *entered into* that discovery, as an indeterminable but integral part of the creation itself. While we do not “create” our reality or world, there is likewise no ready-made world-out-there awaiting our discoveries or creations within it. Mind and its world-creation give rise to each other, just as do creator and that-created.

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My second argument has been that creation is not just an intelligent process, it is intelligence itself, as is its vital counterpart, evolution. Just as this creative-evolution doesn't "have" intelligence, but *is* intelligence, whatever is created therein is equally an expression of that intelligence (as will be picked up again in Chapter Seven.)

Creation is an endless process stochastically exploring every possibility of being. *Stochasm* is from a Greek word meaning randomness with purpose, and to deny a random factor in creation-and-that-created is an error, as is denying purposefulness behind that randomness or its creation. Evolution is an ever-present pressure or urge within any and all created phenomena or living events *to move beyond any limitation or constraint within such event-phenomena*.

So evolution is the *transcendent* aspect of creation, rising to go beyond itself, being the response of life to its own ever-unfolding evolution. And every living phenomenon or event reaches, at some point, its eventual limitation and constraint. There could, in fact, be no creation that is final, since even the concept of finality would indicate limitation against which evolution, as is its nature, would, perforce, move to creatively rise and go beyond.

To move beyond limitation and constraint is a two-fold process: first, to generate such movement itself, and secondly, to create that which lies beyond and manifests through that movement. And that which lies beyond the limiting constraints of something created, comes about only by the movement of transcendence "going-beyond" itself.

"Where" transcendence might go in "moving beyond" is determined by the going itself, as we will further explore in Chapter Eleven. ("We walk by falling forward, and go where we have to go..." as poet Roethke expresses it.) Our "going" enters into the nature of that which we enter into and bring about *by* our going – which is the very definition of the *strange loops* rising within this "*mirroring*" process. And herein lies the central thesis of this little argument of mine, as it did in my first book, *Crack*, well over half-century ago.

By its nature, evolution reveals all "points of constraint-limitation" in creation, and creation takes place stochastically in response. Stochasm's purposefulness acts to select, from or out of that profusion, what is needed or what *works*. Like water, evolution seeks out, through means which come about *through this seeking-out*, a level which lies beyond its present state.

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Since evolution's "present state" is always the moment of its stochastic movement to selectively go beyond itself, that "moment" is ever-present and all there is. As Robert Sardello points out, in that Moment, the future will flow into our present, "making all things new," if allowed.

*Enter Death: The Ever-present Third Factor in the Mirroring of
Evolution-Creation*

Not death itself, but the fear it engenders, is the greatest of constraints. Moving to overcome this limitation is complex, since abolishing death (were such possible) would change the very ontological constructs of reality as it has evolved. So even the *notion* of abolishing death, as proposed in some Eastern philosophies, is counter-productive and would stop creation in its tracks. Fear involves the complexities of our ever-changing emotions. Emotion involves our capacity to relate and interact, which is a cultural issue, not ontological, and tackled later in this book. (Ontology is a general theory-explanation of how reality arises and functions, and such an idea or system of thinking proves to be as critical an issue as creation itself, not just a mind-wandering "ideology.")

In the meantime, consider that cosmos and person (you and me) are of the same order, the same essential creative function, regardless of the size or measurements involved (light-years or micrometers). We were that creative function on its "micro-meter scale" until we invented the electron microscope which calls for even finer gradations or "scalar measurements," cumbersome refinements we can do without here.

For clarity at this point, however, a certain "biological" complexity is involved. Remember that *bio* simply means life, while the logical way it works is our knowledge of this life process. And this process has a very logical "way it works," though not through some machine-like or precise way. Wandering or meandering stochastically through its endless branching ways is more true-to-life as it happens.

So, with such precautions I launch into the following brief simplification of what is equally an explanation of this incredible intelligence within our life's design. The sample given here involves a wondrous, actual and vital-to-our-life creature called *mitochondria*.

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*The Unfathomable Intelligence of Creation-evolution found in Mitochondria,
an Early Arrival in our Matrix-sea*

Neurons, or brain-cells, are created early on in the *neural tube* of the fetus in the womb. The neural tube is an organ sprouting somewhat early in a fetus' body. It morphs into the heart during gestation and produces neurons en masse as it does so. These neurons are not self-mobile (as some cells are), and are actually towed from the fetus's neural tube into their eventual head-position by mitochondria (see the work of Rakic, Sagan and Margulis¹). Mitochondria are some of the tiniest and earliest of all life forms, as well as an enigma that well illustrate the brilliant design within or behind creation-evolution, an enigma that needs a brief section of its own here.

At some early point of Earth's evolution, when the materials and conditions were just right, Nature birthed a vast profusion of single-cell life forms in her matrix-sea (from this word *matrix* we get matter, material, mother, and other sources originating in the sea). These single cells were both nucleated and non-nucleated – with and without a DNA molecule – and among this vast profusion, those nucleated cells offered possibilities for mutation and development. Those that best fit into or could adapt to the ever-changing environments' ebbing and flowing, and could survive and/or thrive in them, evolved to ever larger forms time and again, some finally crawling out onto land, as detailed by Darwin, and exemplifying stochasm – purposeful randomness – as Nature's way from the beginning.

Among this limitless plethora of random cells with nuclei, one particular and very tiny single-celled creature stands out. Labeled *mitochondria*, these rather box-like cells were and are exceptional and rare in having only half of the conventional DNA molecule needed for reproduction of themselves and possible mutation into a more complex form.

According to microbiologists Margulis and Sagan, these mitochondria seem to have remained pretty much the same as first created in those primal seas. Short-changed as mitochondria, with their half-DNA, they were apparently designed *not* to evolve, since they met the needs of Nature's long-range plans for the myriad life processes swimming around at that time, as well as time yet to come. On her first try, Nature apparently hit her target for what would be needed in the coming ages of evolution. This stable, unchanging, non-mutant mitochondria seems a case of a selection without the profusion from which selectivity ordinarily takes place, rather a backward way

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of working, as in the mirroring of a strange loop phenomenon. (Of course Nature, who has a corner on the creative market, may have run through a trillion tries before hitting on mitochondria as what she was after, since time was no factor at that point and doesn't apply. And those preliminary attempts may have simply vanished without trace, "like foam trails on the sea," as poet Machado expresses it.)

With their short-changed DNA, mitochondria can survive and multiply only by being incorporated into other fully endowed cellular forms (and thus their very small size: they can fit into any variety of cellular creatures). On being incorporated into other cellular forms, mitochondria must first borrow a portion of their host's DNA, and this borrowed bit serves as the other (missing) half of the mitochondria's own DNA.

Through this incorporation, or adoption, mitochondria, with their now-whole DNA (half native to them and half adopted from their matrix-environment), are "read" by that host body as being a benign part of that host's body itself. Otherwise mitochondria would be "read" as an invader to be expelled by the host's immune system. Thus mitochondria can fit into and be accepted by any creature, as that creature evolves. On being incorporated into a cellular structure, this now-completed mitochondria serves a whole laundry-list of functions critical to the life form, an example of perfect symbiosis in an incredibly brilliant design.

Each – adoptive cellular structure and adopted mitochondria – gives rise to the other. Neither system can stand alone, as is true of humankind and Earth herself, who also seem to give rise to each other. They (and we) are independent, while yet inter-dependent.

Among the myriad of critical functions served, mitochondria are the means by which protein conversion into nutrients, or "energy," takes place, to keep that cell (and itself) alive. Mitochondria reproduce or replicate themselves on demand, according to the needs of their host, and the host in turn meets the needs of her adopted and versatile mitochondria.

Neuron Migration

Most intriguing, graphic, and illustrative in this intelligent design is the critical role mitochondria play in the migration of neurons from the neural tube into their locus in the upcoming brain of a fetus. The neural tube, one of the

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earliest embryonic organs, gives rise to both the brain and heart (as will be explained in Chapter Seven). This migration into the upcoming brain's locus in our head is brought about by mitochondria literally *towing* those new neurons into location in what will be our cranium, where our emerging brain will be housed. (Pasko Rakic's pictures of this micro-tug-boat affair are intriguing.) As the neural tube morphs into the heart over the ensuing weeks, untold millions of neurons flow from that tube, and mitochondria reproduce themselves accordingly, as needed to drag, or tow, that constant flow of hatching neurons into their new matrix, the brain-to-be.

Mitochondria do this by means of slender threads which they create on-site for the purpose of this towing job. When the neuron's destination is reached, the connecting thread disappears and the neuron takes its place among the growing millions, according to its own destined part of the brain's structure.

What about this thread made for the purpose? From whence did it come and where does it go when it disappears? At best these are questions arising from a "misplaced concreteness," to use A. N. Whitehead's term. The threads are, like mitochondria themselves, simply a phenomenon needed at that time for a single purpose. When such a thread is no longer needed, it simply isn't there, nor, apparently are the massive numbers of mitochondria created on-site for the job. Effect can precede cause as needed in this magical-mystery tour of creation, though such an observation is somewhat offensive to strict materialists.

The Tale of the Missing Tail

Mitochondria play an equally critical role in human reproduction (to which we will also return later). A sperm's long tail, by which it propels itself upstream to its destination, dutifully disappears when it reaches its goal and is no longer needed. That tail-of-the-sperm consists of nine microtubules forming a most magical circle of such tubules, and making a quite serviceable and efficient tail. Mitochondria power this magical-circular tail until, at sperm-journey's end at the portal of that life-source egg, that vigorous tail disappears.

The sperm's tail doesn't "drop off," as one might speak of the event, since there is nothing to drop. That tail has been only an oscillation of

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frequencies furnished by the mitochondria; the smart critter simply switches off the power when the tail is no longer needed, at which point the tail isn't.

Understanding that there is no sperm-tail that drops off, only a “vibrating” or oscillating frequency that stops its oscillation when no longer needed, is a key to how life works. One is tempted to say “*it* stops *its* oscillations,” but there is no “it” that oscillates – there is only oscillation as an event-function. By oscillation is meant a “turning off and on” of whatever power, radiation, force, frequency, resonance that is involved in and brought about by mitochondria.

There is no end to oscillations oscillating, since in one sense there is no beginning either. What is “it” that would begin or stop oscillation? Oscillation, like creation, is a verb, not a noun, nor is there much to reify here and give substance to, even if “only” imaginary.

Tubulin and the Stuff of Micro-tubules

We speak of nine microtubules in a circle forming a tail, but what is a microtubule? Every cell of our body encases that folded-up bundle of DNA and a cellular “filling” of sorts called tubulin. Tubulin, in turn, is a kind of semantic substitute for an unknown, and probably unknowable function-process – giving it, if not some “reified” substance, at least a label to which we can refer. (Reification means to attribute substance, or material stuff or “thingness,” to some imaginary wish-think product of our mind. This, as physicist David Bohm insisted, is an error of our thinking that can and too often does lead us astray.) Tubulin is that of which microtubules are made, as microtubules are made of tubulin, surely a trick of a mirroring tautology. To say that tubulin is not a substance as ordinarily spoken of, but rather an oscillation of that same mitochondrial-sourced “power” that forms the sperm-tail and powers it on its journey, is apparently much ado about nothing. Yet it is a key to everything.

Such oscillation may be, in fact, similar to the “quanta” of quantum theory, wherein we find a quanta has no final substance, but “ends” as such only in relationships or resonance among other things (at which point we exercise a bit of reification to give such abstract nothingness a bit of “substance,” at least for discussion and perhaps peace of mind). Tubulin and its microtubules, without which cells could not exist, give a causal basis for an

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event that is otherwise inexplicable to our logical, rational “scientific” mind; they are “effects” without a cause, rather a no-no in earlier science.

Later in this book we will call briefly on Mae-Wan Ho’s observation that a cell is “made” of a liquid crystalline form-substance, similar to the screens of televisions and computers. From one standpoint, Mae-Wan claims, the body’s 78 trillion cells function as a single, coherent liquid crystal. This observation changes the complexion of nearly everything in physiology-biology, while highlighting the role of the many mystery-characters behind the scenes in our life, functions which work perfectly well without our knowing or needing to know much about them.

So in summary, mitochondria are known to be the power-providers of cellular life, transforming proteins into usable energy and vice-versa, as well as a host of other critical tasks, such as the discovery by Rakic that mitochondria aid in bringing about neural cell migration from the neural tube. And those neurons pour out of that neural tube by the millions, as that heart morphs into old-thumper; and to this morphing, mitochondria respond by multiplying themselves accordingly, spinning out more mitochondria and those threads with which to drag those neurons into their new home in our head. And herein, to my thinking, lies a significant indication of an incredibly intelligent design functioning along side, as an integral part of, the stochastic random-chance-selectivity of evolution, where they seem virtually a creation *ex-nihilo*. That is, *out of nothing at all* – this *ex-nihilo* being a no-no in academic science, *but what a wondrously enchanting nothing-at-all it proves to be.*

¹ See Margulis, Lynn, and Sagan, Dorian, *Microcosmos: Four Billion Years of Microbial Evolution*, University of California Press, Berkeley 1997; also <http://rakiclab.med.yale.edu/>