

Article

Part I: A Critique of River Out of Eden: Our Celestial Prison

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ABSTRACT

The analogy of supernovae is applied to the information explosion taking place on our planet that he calls the replication bomb, linking it to DNA. The exponential growth of information is unrelated to the growth of digitized DNA information, because the linear branches of the evolutionary tree are unrelated according to Dawkins' reckoning. The vast majority of historical species are extinct so the river of genes must be drying up. He cites a simple self replicating chemical of two links in its chain as evidence that life must have started as a chemical accident while DNA can have billions of nucleotide links wrapped around complex histone spools. Chemical reactions in a cell require protein enzymes that employ non-covalent forces to catalyze them in highly recursive patterns so the cell survives by complex energy patterns that are not chemical in nature. Dawkins proceeds to identify ten thresholds triggered by the replication threshold, essentially following a process of hierarchical order contrary to the Darwinian position of random order that he is otherwise committed to.

Key Words: Charles Darwin, Theory of Evolution, Cosmic Order, intellegent direction, spirituality, atheist, Richard Dawkins.

5- The Replication Bomb:

Dawkins begins this chapter of his book with reference to the three supernovas that have been observed in our galaxy since Chinese astronomers first documented a star exploding in 1054, to leave the Crab Nebula in its wake. He applies the analogy to the information explosion that he says has occurred on our planet, and that he calls the replication bomb, linking it to DNA. "The reason self-replication is a potentially explosive phenomenon is the same as for any explosion: exponential growth—the more you have the more you get."

Double speak creeps in again here for he jumps from DNA replication to our technological culture. We have seen that the latter is dependent upon language and is not genetically programmed by accident. It is through us, he says, "—through our brains, our symbolic culture and our technology—that the explosion may proceed to the next stage and reverberate through deep space."

But why, in the first place, are we to assume that there has been an exponential explosion of digitized information via DNA survival? If less than one percent of species have survived to the

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present, this indicates a growing proportionate *loss* of information that has been accumulating through the evolutionary process. The only way it could be preserved is if some intelligent process could reemploy the information gained from extinct lineages to enhance the evolving characteristics of surviving lineages. The mammals for example diverged early in the reptilian age some 160 million years before the demise of the dinosaurs.

We might expect an intelligent process to work in much the same way that we humans are able to reemploy the lessons we learn in one circumstance to help us cope in certain other circumstances that arise in the future, since different experiences are frequently presented to us with inherently similar characteristics. Intelligent creatures are endowed with memories and a capacity for recall that permits the spanning of space and time. To the extent that we can understand the ever changing stream of circumstance we can tailor old memories to reapply similar techniques to new situations. Memories are not hard wired to the thought process, since the abstract concepts of thought are not hard wired.

However, the recall process is tensionally coupled to sensory input such that it is always relevant to the ongoing stream of circumstance. As a simple example, when we see that we are out of groceries, we remember that we must go shopping to stock up for future needs based upon our past experience. We span space and time through our perception of appropriate needs and we respond accordingly. It is in this way that we effect the integration of history, and the evolutionary process is busy at the same endeavor. So is the whole cosmic order that turns the heavens. But all of this is contrary to the Darwinian position. So accordingly information digitized by DNA must be being lost.

Dawkins then turns to the origins of life. He concedes that there is no direct evidence of the replication event that started life on the planet, but insists that it *must* have begun as a chemical event. There is no evidence whatever for that either, but most Darwinists seem *certain* that it was through a series of chemical accidents that biological life got started. That is blind unsubstantiated belief. It is difficult to understand why anyone should volunteer to be so totally committed to a mindless idea that requires their own complete psychic demise at death.

After an excursion through right and left handed stereoscopic chemicals that rotate polarized light in opposite directions, and that can act as a template for their mirror image forms, Dawkins comes to the work of Rebek and colleagues. These researchers demonstrated that true self replication is possible among simple molecules, something that molecules don't normally exhibit. Two small molecules are shown to join in solution to make a third, which then acts as a template to promote the formation of more of itself from the two starting molecules still in solution. The population of the product molecule thus grows exponentially. One of the starting molecules comes in a variety of forms so that there can be competing varieties of the product molecule replicating itself. Ultraviolet light can also mutate one of the products into a slightly different form which is more adept at replicating itself and soon dominates the test tube population.

Dawkins is so sure that Rebek and colleagues are on the road to replicating the origins of life that he refers to these simple chemicals as "protocreatures." One can hardly construe this as impartial science. These "protocreatures" consist of a chain with only two links and the two starting molecules chemically combine to produce them initially, without benefit of their template. One

might as well say that they can jump to Jupiter because they can jump a foot. All it takes is a little more practice.

DNA can have billions of links in its chain and its monomers do not join up spontaneously without benefit of a template and a great deal more. They need enzymes to specifically catalyze thousands of essential chemical reactions in the life of a cell. Enzymes are large protein molecules that fold up in specific ways to fit the reactants together in just the right way for them to combine in each reaction. They can speed up the reaction rate millions of times, so that each chemical reaction in a cell needs one. They are produced by the machinery in the cell, with the aid of still other enzymes, according to DNA blueprints that encode their amino acid sequences, typically hundreds to thousands of units long for each enzyme. Enzymes have active sites that bind reactants by non-covalent forces and they are not themselves chemically altered in the process of catalyzing reactions. They are themselves transcribed and translated with the aid of enzymes so the whole process is a highly recursive energy pattern distinct from the covalent molecular chemistry that forms the cell and its organelles.¹

Selection must take place from twenty amino acids that must each be identified and brought into place for assembly in a very precise order. The assembly machinery consists of many ribosomes which are chains of RNA, also produced with the aid of still other enzymes from DNA, and these are precisely connected and folded into complex nodules. The assembly machines themselves are useless without both transfer and messenger RNA, both of which are transcribed with the aid of still more enzymes from DNA which must partly unravel from the histone spools it is wrapped around in exactly the right place for this to happen. A host of transcription factors and epigenetic factors are essential to the process. Messenger RNA brings to the ribosomes the section of blueprint from DNA that encodes the amino acid sequences for making a specific protein, while transfer RNA collects the necessary amino acids and brings them to the ribosomes for assembly. Non-coding DNA and RNA comes into play in a complex variety of ways.

It is obvious that migrations throughout the cell must be specifically directed, timed, and integrated, according to an incredibly complex host of needs, yet the direction process is a complete mystery. The cell membrane must also remain in contact with the external environment and for this purpose it has complex proteins embedded in it that contact numerous external chemical messengers and trigger complex internal sets of chemical messengers, many of them in cascades of reactions that transmit chemical instructions to DNA. The cell must also acquire essential raw materials and cut them up like vegetables for a stew but in precise ways with the aid of still more enzymes. And the cell must identify and dispose of waste materials as well as repair itself and maintain a membrane together with its internal architecture. Then every once in a while it must spontaneously divide itself in two, each half containing precisely one complete set of encoded plans, together with all of the other equipment and enzymes necessary to continue the work.

Miss out a few critical enzymes and the whole thing won't work. Bacteria typically have a few thousand enzymes to catalyze the necessary chemical reactions. The eukaryotic cells that are the building blocks of all plant and animal life are much more complex, somewhat like comparing a

¹ http://www.cosmic-mindreach.com/Gene_Expression.html

747 to a motorcycle. They have many more enzymes that are required to function in a much more complex environment with a nuclear envelope and a complement of other organelles. But even the simple bacterium has as much traffic within it as a large city crammed with motorcycles, cars, and trucks, each headed for specific destinations to perform a great diversity of tasks and guided by processes that we can hardly guess at.

The simple truth is that it remains a complete mystery how these diverse and incredibly complex and interdependent processes ever came together into a functional whole by any means imaginable, much less by accident. The simple truth is that the collective ingenuity of all of the biologists on earth still cannot begin to fathom how the many pieces of the puzzle work together, even after having identified much of the chemistry involved. They have no means at their disposal by which to research how experience itself is organized and integrated. The Darwinian paradigm precludes it, since Darwinists believe they already know.

Undaunted, Dawkins plods onward. He points out that it is only in the last few decades of our four billion year evolutionary saga that our nervous systems have developed radio technology and now an expanding shell of information-rich radio waves is advancing outward from the planet at the speed of light and might one day be detected by remote civilizations far out in space. He calls it “...the radio threshold—the moment when a proportion of the information overflows from the parent world and starts to bathe neighboring star systems with pulses of meaning.”

Note the double speak use of the word “meaning.” Here Richard Dawkins unwittingly confirms that he himself believes that there is such a thing as a basis to meaning that is not genetically programmed and that altogether completely transcends DNA survival. How else could alien creatures hope to intelligently identify it? He has just finished saying, “The Centaurian radio astronomers would report, amid fanfares of excitement, that the star Sol had exploded in the informational equivalent of a supernova (they’d guess but might not be sure, that it was actually a planet orbiting Sol.)”

From this he says we can guess that information explosions “...pass a graded series of thresholds.” He has now begun to talk about the nature of a tiered order that transcends and subsumes random mutation and natural selection, in open contradiction to his own earlier position, which somehow seems to conceal the meaning in his own words from himself. He certainly isn’t a bad fellow at heart.

He first identifies five major thresholds in reverse historical order: the radio threshold, the language threshold, the nerve-cells threshold, the many-cells threshold, and the replicator threshold. The last one is now called “...a triggering event that made the whole explosion possible.”

From here he jumps back to his old position and uses the example of chain letters to emphasize the enormity of the numbers that result from geometric progressions, and different strategies that people may invent to get the letters duplicated. Then he says, with reference to the letters, “It is important to understand that none of these replicating entities is consciously interested in getting itself duplicated.”

Of course chain letters are not interested in getting themselves duplicated. That's exactly the point! Neither are inert chemicals like DNA. Chain letters have intelligent agents behind them, namely people that are manipulating their content in order to achieve their replication. So does DNA have intelligent energies working behind it, manipulating its content so that it relates meaningfully to the working machinery of the whole cell, as well as to organs and host in complex multi-celled creatures.

Like chain letters, living creatures are complex communications systems in intimate contact with themselves and their environment. "But it will just happen that the world will become filled with replicators that are more efficient," he says, ignoring the fact that people are writing the letters, just as all Darwinists ignore so much obvious evidence that intelligence is implicitly at work in the creative process. Just because a letter may be left unsigned is no reason to assume that it wrote itself.

Dawkins adds the example of the "St. Jude Letter" to show how easily people may be duped into believing, implying that anyone who believes there is anything more than random chemistry at work in the creative process is also easily duped. On the face of the evidence the opposite is true.

"A successful replicator molecule will be one that, for reasons of detailed chemical technicality, has what it takes to get duplicated," says Dawkins, implying that although the technical details are beyond most readers, we may take his word for it. "All the organs and limbs of animals; the roots, leaves and flowers of plants; all eyes and brains and minds, and even fears and hopes, are the tools by which successful DNA sequences lever themselves into the future," he says. But you can extract pure DNA from a cell and place it floating freely in a jar with all the necessary monomers to replicate itself and it will not do so. Naked DNA is an inert chemical. That is why it is able to preserve genetic integrity.

By stressing this theme over and over Dawkins expects us to believe that life got started by simple self-replicating chemicals that by some completely unknown series of accidental steps became DNA, a complex chemical that is not remotely similar. But even if we take raw DNA or RNA as a starting point, we are still no closer to life. We can sprinkle DNA in the earth, and streams and lakes and rivers and oceans and organic soups forever and it will not initiate new life. This in fact happens daily on a huge scale, complete with the cellular machinery that surrounds it, every time a leaf falls or a creature bleeds or kills or dies, but new life does not reassemble itself and come creeping out of our graveyards. The host creature is not something physical, and when it dies, the life disappears from the chemistry. The host is a manifestation of the intelligent processes that guide and direct the chemistry of life. The host is a microcosm in the universal chore of integrating history.

Dawkins next turns back to thresholds for a guess at the steps in the chronology of a life explosion on any planet, anywhere in the universe, the series of thresholds through which life must pass. He is entitled to his guess, even though he is unaware that he is back to sniffing out the nature of hierarchies in the cosmic order. He is talking about deciphering an order to life that transcends and subsumes its primary chemistry. He is also talking to a certain extent about climbing a ladder of sentient awareness to conscious thought. But then, typical of his science training, he reverts to a

linear progression of technical achievements rather than stick with our continued evolution as intelligent beings.

He then adds to his initial five thresholds and identifies ten thresholds in all, and some of them are legitimate levels in a universal hierarchy of a higher order than the three levels *Idea*→*Routine*→*Form* identified earlier. He even says that some of these steps are likely to be genuinely universal, while others may be peculiar to our own planet. “It may not always be easy to decide which are likely to be universal and which local, and this question is interesting in its own right.”

So Dawkins does have some inspiring glimpses into reality. He really does believe in transcending universal influences that are operative in the creative process. He is even attempting to integrate history through the chronology of the thresholds. And him a Darwinist no less!

Before reviewing Dawkins’ ten thresholds it is worth diverging for a moment to explain a little about hierarchies. Since we all encounter them in business organizations it will be convenient to explain how they become established there.

In a one man business there are no hierarchies apparent because they all exist in the intelligence of one man and he does all the physical work. To an outside observer the physical work is all that is seen and we may call this the *form* level. Behavior takes a certain form and gives a specific form to a product.

Let’s say our businessman is making stainless steel screw nails for the marine industry. Lets call him Hank. Hank has one machine that he operates himself, he purchases and stocks the raw materials he needs, he keeps his own books, he services and repairs the machine, and he makes his own sales and deliveries. He is a factory laborer, purchasing agent, warehouseman, accountant, repairman, salesman and delivery boy all wrapped up in one. All the variety of jobs that Hank does are *form* level work, that we might better call *functional work* in the case of a business.

Hank’s business is good and in no time he has twenty machines making stainless bolts and a variety of fittings as well as screw nails, and all the jobs that he used to do have been delegated to fifty or sixty employees. They are divided into departments that each do different kinds of *functional work*. Even the foremen or heads of these small departments are concerned with the form of their final product and thus do functional work through focusing on task cycles.

Does that mean that Hank now has nothing to do? Not on your life. Now he has headaches with matching up work schedules with sales commitments, and cash flow financing with customer credit, and inventory levels with turnover, and costing with pricing, and quality control verses customer satisfaction, and equipment maintenance versus replacement, and rental space versus purchase, and more, that all used to fall into place simply in his head. Now he has to commit plans to paper and keep records that never used to be needed. He has to budget all his resources against all his commitments according to product cycles.

This is a new kind of work that does not directly involve the *form* of the end product that employees in each department produce, whether it be a balance sheet or screw nails. Hank’s work

now involves the *routines* of his business that are predominantly associated with product cycles as opposed to task cycles. We may call this kind of work *supervisory work*, keeping in mind the special meaning associated here with the word *supervisory* to distinguish it from *functional work*. A supervisor in this sense works on a higher level of abstraction than a functional foreman. And now Hank has to do hiring, and evaluate pay levels, and train and discipline as well, but this is usually of a functional nature.

Hank's business continues to prosper and grow. He has started to cast, forge and machine larger stainless fittings, valves, and small pumps, all for the marine industry. He has put a down payment on factory space and offices that now house five hundred employees. He has had to further delegate the personnel function at the *functional* level, and he has also had to appoint a Plant Superintendent responsible for *supervisory* level work in the Operations Department, with plant foremen, maintenance foremen, scheduling, quality control inspection, and cost accounting, all at the functional level reporting to this superintendent. He has also had to develop an Engineering and Design Department with delegation of *supervisory* work to a Chief Engineer, with design engineers, draftsmen, mold makers, costing and budgeting, scheduling, materials testing, and technical inspection all at the functional level reporting to him. He has also had to delegate work at the supervisory level to a Sales Manager over a Sales Department, and to a Chief Accountant over a Treasury Department, each with a variety of tasks at the functional level reporting to them.

Hank himself is now obliged to concentrate primarily on what we will call *administrative level work*, concerned with the assimilation, maintenance and development of *knowledge* implicitly essential to the facilities, to the technical and human resources, and to the infrastructure of the organization generally. He is concerned with these kinds of infrastructure cycles, as opposed to product or task cycles.

A three level universal hierarchy was previously identified but it subsumes and transcends a four level universal hierarchy in which explicit *knowledge* becomes distinct from the integrating *idea*. A four level hierarchy may therefore be described as follows: *Idea*→*Knowledge*→*Routine*→*Form*. Four levels are common in large organizations whether economic or biological. Hank's work has now graduated to administrative *knowledge* level work.

It soon becomes apparent to Hank, however, that conditions are just right for him to go international and if he doesn't do so, it could adversely affect his business at home since boats and ships travel the world and they need service. In order to do so he must fill out his line of products, have a network of international distributors and a couple of manufacturing plants abroad. He has to delegate *administrative* level work to develop the necessary facilities, resources and infrastructure. He also needs a Marketing Department, probably at the *supervisory* level, completely distinct from Sales, to assess international markets and keep the stream of available products current with market needs. The other five departments, Operations, Engineering, Sales, Treasury, and Personnel, will probably all be promoted to *administrative* level work with Vice President chiefs.

Hank has had to move up another level of abstraction in his everyday thinking. As President and Managing Director, he is now concerned primarily with *idea level managerial work*. This kind of work integrates, maintains, develops and diversifies, or consolidates his far flung organization. This work gives overall coherence and direction to the organization. It was there when he was a

one man operation too, but he was too busy to give it much notice. Nor did he need to. Now it requires nearly all of his time.

The point in all of this is that every business organization during its growth goes through these same four major stages of delegation up a hierarchy of different levels of work. (In still larger organizations the process starts again with a broader focus, involving considerable diversification.) As delegation proceeds the same six departments always break out, tailored only to the nature of the business they are in. Within the larger departments, especially operations, the same six sub-departments break out again within it as it grows. In practice intermediate levels of work creep in and the six departments are not always separately delegated, but invariably when this happens bureaucracy and political infighting begin to erode the organization from within. The organization loses its transparency and ceases to operate intelligently and responsibly.²

Note, however, that direction in the hierarchy always comes in reverse order to that in which delegation occurs. *Idea* gives direction to *Knowledge* which gives direction to *Routine* which gives direction to *Form*. Thus it is also in the evolutionary order. We have evolved up through the plants (cellular form), the invertebrates (motor sensory routine), the vertebrates (cerebral awareness in knowledge), to *Homo sapiens* (idea integrating history). The history of our evolution has been incorporated into our anatomy such that our creative *ideas* give direction to our accumulated *knowledge* which gives direction to our motor sensory *routines* which animates our physical *form*. But this pattern is surely a reflection of a self-similar pattern to universal intelligence that has directed the evolutionary process in the first place, as the evidence clearly and powerfully indicates, culminating in the delegation of conscious intelligence to humans.

When we come to assess the evolutionary process in this light, the futility of the Darwinian position becomes apparent. It fatally cripples itself by focusing exclusively on the physical *form* of chemical processes, which are valid enough in their own right, but they don't give direction to the evolutionary process. By concentrating exclusively on the lowest level in the hierarchy Darwinism has no hope of ever advancing up through the hierarchy to understand the integration of living processes. The more Darwinists win, the more we all lose.

With these thoughts in mind let's return to Richard Dawkins' ten thresholds.

The first threshold, he says is the arising of some kind of self copying system with some rudimentary form of hereditary variation, with occasional random mistakes in copying, which he says will result in a mixed population competing for resources which will become scarce.

Now the earliest fossil evidence of life has recently been pushed back to nearly four billion years ago, almost immediately after the planet had cooled sufficiently for life to survive, so it didn't take

² A full description of the principles involved in structuring a business organization, and how to apply them, is given by the author in *Enlightened Management and the Organizational Imperative*. <http://www.cosmic-mindreach.com/Management.html> . See also http://www.cosmic-mindreach.com/Organize_structure.html and <http://www.cosmic-mindreach.com/Three-Brains.html>

vast spans of geological time for life to evolve, despite infinite odds against it happening by accident. This should lead us to look for another route as to how it began.

One reasonable alternate was suggested early in the century by Svante Arrhenius, and it was promptly ignored. A Nobel prize winner in 1903, he suggested that the earth could have been seeded by spores arriving from interstellar space. Sir Fred Hoyle and Chandra Wickramasinghe have further investigated the possibility and found it quite possible that bacterial spores and perhaps very small eukaryotic spores could survive the rigors of interstellar space and be carried by comets to the inner solar system where solar radiation pressure is sufficient to carry them to a soft landing on planets with atmosphere. It offers a credible mechanism by which life could be seeded on suitable planets from an interstellar gene pool. There are also mechanisms by which dormant spores can be ejected from planets to maintain the pool. Asteroid impacts, for example, are common in the early life of planets and they can readily eject spores into interstellar space.

These efforts to investigate alternate origins to life on the planet have been largely ignored. The Darwinist lobby is powerful. Even though the findings make a lot more sense than bacteria forming themselves spontaneously by accident in a primordial inorganic soup, they are dismissed. Hoyle and Wickramasinghe conservatively computed the odds of producing by chance from twenty amino acids just the two thousand enzymes necessary for a simple bacterium to function. They are $10^{40,000}$ to one, against. There are no names for such vast numbers. It would take ten pages just to type out forty thousand zeros after a one. It is infinitely more than all of the electrons and protons in the universe. (That number can be written in a couple of lines.) And those odds only get us the enzymes. They do not tell us how the enzymes work together with DNA and RNA to produce the organized machinery of the cell.

But Darwinists turn their heads and go back to talking about chemical accidents, ignoring odds that a bookmaker wouldn't take if the planet had a billion billion years to work the result. It's more possible that life was seeded intentionally by advanced alien civilizations. The appearance of eukaryotic cells is as much a mystery as that of prokaryotes, for their level of complexity is several orders of magnitude greater. Even the "miracle" option is more possible than chance. It would entail a transcendent intelligence "moving on the face of the deep," directly assembling the first living cells and setting them about the task of replicating. There are surely organized energies of some kind at work in the cell that govern the complex migrations of chemicals to the right places at the right times as if they were all in communication in response to mutual needs. But it's not necessary to invoke this kind of speculation when the panspermia theory of Arrhenius, Hoyle and Wickramasinghe can be tested.³

In any case the development of the plants and their competition for resources did not deplete the planet's resources so much as enhance them. Plants capture the sun's energy and store it, in apparent defiance of the second law of thermodynamics, since even in death their decay products leave the environment more ordered. Each chemical reaction in a cell or a plant obeys the second law, leading to an increase in disorder, and yet the intelligent integration of all the interdependent

³ A description of the Panspermia Theory and evidence as to how it may work is given in *Evolution From Space*, by F. Hoyle and C. Wickramasinghe, Granada Books, London, 1983.

reactions and processes going in a cell, taken together as an integrated whole, generates an increase in order. It cannot be an accidental process attributable to atomic billiards. But however life got started it was a first threshold. We may assume that much.

Threshold 2 is the Phenotype Threshold. “On our planet, phenotypes are easily recognized as those parts of animal and plant bodies that genes can influence. That means pretty well all bits of bodies.” Now even single celled creatures have a complex cell body, and since we don’t find chemicals in nature replicating themselves nude, including DNA or RNA, how can this be assumed to be a threshold at all? The living record is replete with surviving examples of every other major step in the evolutionary process. The self-replicating mechanism, as we know it, is utterly dependent upon the complex machinery of the whole cell and there is no sound reason to expect that it has ever been otherwise. There are many hundreds of enzymes in the simplest bacterium that are necessary to catalyze the chemistry essential for replication together with the growth and maintenance of cells generally. Let’s set this threshold aside as redundant.

Threshold 3 is the Replicator Team Threshold, “...which may on some planets be crossed before, or at the same time as, the phenotype threshold. ...The genes work in teams.” Genes are obviously organized in some way to integrate information and to produce a coherent result, and again there is no sound reason to expect that it has ever been different. The simplest free-living cells, pleuromona, are estimated to have about a thousand genes, most of them committed to encoding the amino acid sequences in making the protein enzymes that are essential to catalyze the chemistry essential for replication, maintenance and growth. Escherichia coli, a more typical bacterium, has about 4000 enzymes. The latter translates to about 4,000,000 base pairs in precise sequence, a far cry from two links in the chain of a self replicating chemical under controlled conditions. A human being has about 2.9 billion base pairs in its genome, and for some strange reason the genome of the South American lungfish is about thirty-five times larger than that of the human. In any case there is a total absence of evidence to indicate a progression from replicating chemicals to a cell body with genes working in isolation, to genes working in teams. The evidence in fact indicates that Threshold 3 came at the same time as Thresholds 1 and 2, that the living cell is so interdependent on all of its working parts that it somehow appeared on the planet as a functioning whole.

But Dawkins doggedly pushes his point further: “...it is obviously tempting to leap to the assumption that Darwinian selection nowadays chooses among rival teams of genes—to assume that selection has moved up to higher levels of organization. Tempting, but in my view wrong at a profound level,” he says. It is hard then to understand why a hundred and sixty million years of prolific reptilian evolution should be wiped out in favor of a few ancient rodents, asteroid catastrophe or not. Perhaps there is a fear that selection moving up to higher levels of organization directly implies that there is a more fundamental order to the creative process than random chance. That would be a crack in the armor that would bring down the Darwinian edifice. And yet there are hierarchies recognized in gene expression, since homeotic genes are known to activate teams of genes in concert.

Dawkins identifies Threshold 4 as the Many-Cells Threshold. He skips over the big event that made this possible, the appearance of eukaryotic cells. When cells divide, he observes: “If two cells do not separate fully but remain attached to one another, large edifices can form, with cells

playing the role of bricks.” He doesn’t address the question of why cells should not separate fully, but remain in obvious intimate communication with one another and develop diverse specialized functions which mutually cooperate to some collective end. They are obviously more than insentient bricks.

He explains that “...many-celled organs acquire their characteristic shapes and sizes because layers of cells (bricks) follow rules about when to stop growing.” Really! How are insentient bricks to follow rules? There must be a development plan that is communicated to all cells in the organ and the organism, all of which have identical genes. Some communication system must be operative to switch specific genes on and off in each cell at just the right time for it to assume a specialized function in relation to all the other cells. And genes themselves must be hierarchically ordered in an intelligent way if some are to act in a directing capacity over others.

It’s good of Dawkins to make the admission that “Cells must also, in some sense know where they sit in relation to other cells. Liver cells behave as if they know that they are liver cells and know, moreover, whether they are on the edge of a lobe or in the middle.” This is a clear admission that a communicative intelligence is at work in the collective organization of cells.

One can hardly assume from this, that how intelligence works is local to our planet. On the contrary intelligence displays all of the earmarks of being universal in its operation. But Dawkins has only lapsed back into double speak, for he then says, “Whatever the details, the methods have been perfected by exactly the same general process as all other improvements: the nonrandom survival of successful genes judged by their effects—in this case, effects on cell behavior in relation to neighboring cells.”

This is more jumping to Jupiter. Dawkins’ bucket just doesn’t hold water. You can’t write off obvious communication between cells as just “a difficult question” to be explained one fine day in the future, not when the evidence so obviously contradicts the only mechanism Darwinists allow to explain it. We may nevertheless accept that multicellular Threshold 4 represents another level up an intelligent hierarchy that is implicit in the evolutionary process, the first level being the living cell, that is, the combination of Thresholds 1, 2 and 3.

Dawkins now jumps several hundreds of millions of years in the evolutionary process, from the appearance of multicelled plants to the development of the neuron, which emerged with the invertebrates.

Threshold 5 is the High Speed Information Processing Threshold, which on our planet may be called the Nervous System Threshold. Dawkins believes in his theme, “...because now action can be taken on a timescale much faster than the genes, with their chemical levers of power, can achieve directly. Predators can leap at their dinner and prey can dodge for their lives, using muscular and nervous apparatus that acts and reacts at speeds hugely greater than the embryological origami speeds with which genes put the apparatus together in the first place.” Dawkins doesn’t see anything fundamentally meaningful in this development other than the survival of DNA, and the leverage it gains. But DNA survives comfortably in creatures without nervous systems, so where is the leverage?

But then again he turns around and among the consequences he acknowledges “...large aggregations of data handling units—‘brains’—capable of processing complex patterns of data apprehended by ‘sense organs’ and capable of storing records of them in ‘memory.’ A more elaborate and mysterious consequence of crossing the neuron threshold is conscious awareness, ...” So Richard does after all acknowledge that there is something mysterious going on in that mystic jelly called a brain, at least to the extent that we don’t yet understand it. He calls Threshold 6 the Consciousness Threshold.

Of course everything is mysterious until we understand it properly. Without mystery there wouldn’t be science. We have seen, however, that awareness is associated with the evolution of an autonomic nervous system in concert with cerebral hemispheres, such that the vertebrates are able to reflect emotive patterns of behavior in cerebral awareness. Because all vertebrates are anchored to a common skeletal, sensory, motor, and visceral arrangement, we have access to the emotive feelings of others than our isolated physical selves. Awareness begins to transcend the self in awareness of others’ feelings. We all empathize with domestic pets, and they with us.

Now what has that got to do with the blind survival of DNA? It’s very difficult to see how it may convey a survival advantage if predators start to empathize with their prey. And if intelligent social creatures have evolved anywhere else in this vast universe, they too must have acquired an ability to reflect on experience and make sense of it. In humans this awareness of other than self is compounded by the development of language and the ability to abstract experience, to think and plan, incurring a need for intuitive insight into the dynamics of experience itself in order to function at all. And the meaning inherent in words is not genetically programmed. It is intuited from general experience that is independent of our individual genetic makeup, whatever the blessings or burdens endowed by the latter may be.

Dawkins calls Threshold 7 the Language Threshold, which may or may not be crossed on a planet. But if there is no conscious ability to deal with experience in abstraction, as we do with words, there can be no independent creative activity, no ability to consciously plan, and no consciously entertained collective social endeavors. These things are all dependent on three focal points to the process of thought, namely one intuitive, one emotive, and one behaviorally explicit. This allows for the conscious expression of the universal hierarchy *idea, routine* and *form*.

Dawkins sees all of this as a flat, mechanically interconnected networking system “...by which brains ...exchange information with sufficient intimacy to allow the development of a cooperative technology.” Notice how he slips in that word intimacy, a value. How can there be intimacy without consciously abstracting meaning from experience and recognizing another as sharing similar conscious intentions? Cooperative technology depends upon it. If this is all genetically programmed there is no meaning to the word intimacy.

But Dawkins goes on to Threshold 8, the Cooperative Technology Threshold. “Indeed it is possible that human culture has fostered a genuinely new replication bomb, with a new kind of self-replicating entity—the meme, as I have called it in *The Selfish Gene*—proliferating and Darwinizing in a river of culture.” It is all so easy, once one realizes the hypostatizing power of words. Just give cultural traits another name and make it out to be another progression of accidents devoid of any transcending meaning, now even divorced from DNA. Just pure greed proliferating

through the cosmos! “Beautiful and inspiring!” No wonder he calls it “...too big a subject for this chapter.”

Threshold 9 is the Radio Threshold, “...the power to make an impact outside the home planet...” May God forbid! It might be better to hope that some alien intelligence may contact us with some constructive advice, especially in the sciences. Of course radio messages have been rocketing into space at the speed of light for nearly a century and in a mere sixty or seventy thousand years increasingly faint echoes of our collective global radio racket could begin reaching most star systems in our galaxy, but not in a meaningful form.

“After radio waves, the only further step we have imagined in the outward progress of our own explosion is physical space travel itself: Threshold 10, the Space Travel Threshold.”

But where are we going to go? The moon is barren, Mercury or Venus would boil our blood, Mars would freeze it, the outer planets would crush and smother us, and we can’t work things out where we are. The other planets in our solar system are also very unlikely to be populated by highly evolved intelligent creatures and the next nearest star system is over four light years away. To get there and return with our present understanding of the physics of the universe would take a lifetime, and the relative time distortion would mean that several life times had elapsed on Earth in our absence. Perhaps it is fortunate that there are built-in restrictions to space travel, lest our own barbaric ways become contagious before we mature to a responsible age. Our current science makes a celestial prison of our planet.

If interstellar space travel is possible for intelligent beings anywhere in the universe, they must have a vastly superior understanding of the cosmic order than the simplistic understanding we have so far devised. It is very unlikely that space travel could ever be a practical affair for beings anywhere by traveling through space and time. But a proper insight into the cosmic order transcends space and time. In some vastly superior science this may ultimately make quantum leaps through space possible, but this brings with it other restraints. It is highly probable that intelligent insights into the cosmic order present value constraints of powerful proportions, associated with the mutually conscious evolution of beings from different star systems. It would undoubtedly be an awesome mind expanding evolutionary event. If it was not to have negative consequences for either or both parties, one would expect that it would require highly responsible preparation and planning, as yet far beyond our current capacity to comprehend or relate to.

For Darwinists the outward vision ends on a sadly impotent note, with a space capsule plummeting outward beyond Pluto toward the empty reaches of interstellar space, containing a picture of a naked man and woman. The coordinates of our planet are iconically engraved in relation to the galaxy, in the hope that this tiny craft will someday be met by an alien intelligence that can understand the message. The hope is far more remote than slipping a note in a tiny bottle and setting it adrift, for the ocean of space is immense beyond our accustomed conceptions. To a Darwinist we are forever condemned to the cell, imprisoned with the survival of DNA in the cell, and the whole vast universe can hold no meaning. Although the Ten Thresholds may at first appear to offer hope of more, it seems that Dawkins hasn’t grasped the elements of an intelligent hierarchy after all. Dawkins’ heart is obviously in the right place, for his hopes are high, but the Darwinist logic precludes their realization.

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