Evolutionary Potential: Space and Cosmic Radiation

by Sky Shields and Alicia Cerretani

This is the transcript of a LaRouchePAC video, dated Feb. 25, which is posted at http://www.larouchepac.com/node/17607. Sky Shields is part of the LPAC "Basement Team" and Alicia Cerretani is an editor at LPAC-TV.

Sky Shields: We've made the point, LaRouche has repeatedly made the point, that the human economic process is governed by anti-entropy, by creativity: That's what drives the process forward. So the question is, what actually is anti-entropy? And if you really push and ask the question, you realize, the obvious thing is, anti-entropy itself, creativity itself, is not something that only happens once [human beings] are here, because you had a whole development process that brings us here. So if you want to get a real definition, a first-approximation, sort of experimental experience of, what is creativity, what is anti-entropy, we've got a huge sweep of history to look at, that's not culminating with us, but reaches a new level of development with us.

When we got on the scene, it's distinct. Because, suddenly with the development of human beings, you get willful, conscious creativity. I hope we'll draw it out in some of this discussion. You get a phenomenon, seemingly in the universe, that is capable of understanding, to a greater and greater degree, the way that whole universe functions. The first thing ever in the universe that does that. All kinds of other things in it take part in that process, but this is the first thing you get that is capable of sort of subsuming it.

Darwinism and Creationism: Both Frauds

Alicia Cerretani: Well, taking a look at some of the things we've been talking about: Just take evolution, biological evolution, which is a fun place to start, because it's completely unsettled, the jury is completely out on this one. There's a number of different places to look, but the whole theory of evolution, the whole phenomenon of Charles Darwin, really has been imposed on this discussion, on this really incredible, abiotic/biological creative history. But Darwin's idea of "natural selection," "survival of the fittest," predation, that's just been imposed on this whole development, to cap it, to impose a certain very limited kind of thinking on human beings, to say, "This is what your history has been. The development of your species and the surrounding species has really been governed by who's going to survive, who looks the best."

Shields: Exactly. And that's important. They've set it up, where you've got a gang-countergang right now, between the Darwinians and Creationists, both of which are wrong—completely wrong; we'll make the point here. And a game is played to try and make the name "Darwin" synonymous with "evolution." The theory of evolution, the knowledge that the planet Earth has a history existed long before Darwin ever came on the scene. The only thing that was unique about his theory, was that it was something which an empire could use to impose a very specific sort of policy.

In fact, there's a reason that Thomas Huxley latches onto him. Everybody makes this point that, "Oh, Darwin

wasn't a Social Darwinist," etc. No, the Social Darwinists were there before Darwin was there! Huxley was a Social Darwinist before Darwin. Darwin was promoted, because if you can promote an idiotic scientific idea, like the one that Darwin had, that somehow you can get a creative process in the large on the basis of random actions in the small, if you can push that, then you can push the exact kind of mindset that empire wants imposed on a population: There is no creativity; your random impulses in the small are all that you need in order to get a decent end in the large. And if you look, this is Adam Smith's "Theory of Moral Sentiments," that we've often quoted. This is free trade. This is deregulation.

A while back, people saw a real case study of this with Enron in California: what happens when you let things run unleashed and unregulated. With this FCIC Report,[1] people are seeing what's happened on a national and international scale: that the whole idea that this process was just developing organically, as some sort of chaos theory epiphenomenon, was bullshit! The whole thing was gamed, like you said! The *entire* process was gamed; it was manipulated from the top down by financial interests.

Cerretani: Yes, so when they say, "Let nature take its course," it's really, "Let the empire take its course, let free trade take its course."

Shields: Exactly. And it's significant to recognize to what extent a really bad, superstitious view of evolutionary processes, what role that's played in this whole process, and to draw it out.

When you actually look at the fossil record, when you start to realize, "How does the planet Earth actually evolve?" you start to realize there is no series of deductive developments. It's not the case that you've got species' random mutation, and then being selected out for benefit. That the rise of complexity, the development of the Biosphere, is not something that happens on the level of the individual organism.

Cerretani: The whole is never the sum of its parts.

Shields: Exactly. The whole is, in fact, *more* than the sum of its parts. And the idiot screams, "But that's a logical contradiction!" Because the idiot doesn't realize how the universe actually functions. And we'll find that

1. The report of the Federal Crisis Inquiry Commission, headed by Phil Angelides.

FIGURE 1
Archaeopteryx Fossil

taking a look at the study, as it appears here in the evolutionary process, is going to give us some insight into the actual nature of economic processes; that, in turn, in a later discussion, is going to give us insight into some of the major problems that arose in the first half of the 20th Century, around the nature of matter-space-time, physical space-time, which is often referred to as the wave/particle paradox.

We'll see that a discussion of evolutionary processes, will get us right to that. And the necessity that, *in every case*, the whole is more than the sum of its parts.

Where Did Birds Come From?

Cerretani: Right. We have a couple of examples, that illustrate the case quite well. Just looking at the origin of the bird species, the history of what we know today as "birds," and then for the longest time you had this—

Shields: *Archaeopteryx*. (**Figure 1**)

Cerretani: Thank you, *Archaeopteryx*. All right, so, 150 years ago, this thing was discovered, and for the last 150 years, this thing was discussed as the "missing link" between dinosaurs and birds.

Shields: Right. Which is exactly what Darwin needed to justify *his* particular theory.

Again, Darwinism is *not* evolution. Darwinism is a very specific ideological spin on it.

Now, in order for his theory to work, it requires random mutations. Every step of it is a huge stretch: the idea that you get a random mutation in the first place; that you get some kind of process that selects that mutation for survival, all of which involved that mutation mating more frequently than anything else; and from that one point-mutation, you suddenly get some whole

FIGURE 2
Standard Image of an 'Evolutionary Tree'

FIGURE 3
Archaeopterix Was No 'Missing Link'

FIGURE 4
Enantiornithes Fossil

new species branching out. So you get the standard image people are used to, of an evolutionary tree (**Figure 2**). This one little creature comes along, branches out into multiple ones. Those mutate, branch out, branch out, branch out.

For that theory to work, you need the idea of a "missing link." Between two very distinct forms of organism, you should find some transitional fossil that represents the granddaddy of everything that came later on.

Now, shortly after Darwin produces his theory, the *Archaeopteryx* appears, the first fossils appear, and this is claimed to be *the* missing link, between dinosaurs and birds. This is heavily promoted: Everybody learns that this is the example of the missing link; you get it in all of your textbooks on evolution. It's true: This is a creature that lived in the Jurassic period, it cohabitated with the dinosaurs, in fact, it is in many ways more dinosaur than bird. It's got a long, lizard-like tail; it's got a mouth that includes teeth; its skeletal structure looks like that of a lizard, but with feathers (**Figure 3**). And so, the idea was, "this must be," this is your ideal transitional fossil.

But then, you had a problem with that, in the 1980s. It was discovered that you actually had a number of other lizard-like birds, or bird-like dinosaurs—*Enantiornithes* (**Figure 4**), which actually seemed to be distinct in lineage, from the *Archaeopteryx*.

Cerretani: Mm-hmm, you mean they didn't belong to this family tree.

Shields: Right. You run into trouble: how to start to place these within your tree? And then, as you start to look further, to examine the fossil—this one first appears in fossil finds in Argentina; but later, as they started looking in different places, in China, elsewhere on the planet, you start to realize that there's a whole wealth (**Figure 5**). What it looks like, is, in the fossil record, suddenly you get an explosion of all sorts of creatures possessing feathers, that are entirely unrelated to each other—it's as though, right at this moment in history, suddenly, you get the serious attempt on the part of multiple reptiles, to try and become birds.

Now, this whole development has always

been a real problem for the people who would want to argue this in the terminology of natural selection. One of the biggest problems is that you have an intermediate period, during this whole period of the development of feathers; first off, the creatures who are doing it, are unrelated, so you can't trace a single feathered ancestor, they're all developing it. But second, the actual development of feathers plays no role in flight for quite a long time. If you look at these early creatures, they have sort of a down-like feather. And the argument is, "Well, maybe that was just to keep warm"; but then they begin developing very elaborate feathers, without being able to fly.

And likely, even creatures like the *Velociraptor* and some of these other dinosaurs, that were once presented as "scaled," were actually feathered creatures. And then, you're hard-pressed to say, how are these longer plumes of feathers keeping the creature warm? What role do they play? And the standard one—this becomes the silly thing you get with all the natural selection—it's always some form of, "Well, these are absolutely essential for sexual displays"! And the image you get in your head, is that maybe there was some period of time when the dinosaurs just couldn't get laid, until they developed feathers? You know, 10 million years go by, and it's like "Damn! This is a very—"

FIGURE 5
Fossil Record: The Development of Feathers

FIGURE 6
The British Avian Perspective

Cerretani: And the women dinosaurs were all just playing hard to get!

Shields: Yeah, right, for millions and millions of years, and the guys get together, and they're like, "Look, we've got to develop something new here. What we're missing, is . . . *jewelry*."

Cerretani: So what you're saying is that the animals don't have the same mating habits as, say, some—

Shields: British anthropologists (**Figure 6**).

Cerretani: British anthropologists! And they ought not to impose that onto the animal kingdom.

Shields: Right. And all the arguments end up ridiculous at best. Sort of revealing in a strangely Freudian way, at worst, of what actually is the thought-process here—especially what we'll get to, when they start discussing man.

But then, to further complicate this whole picture, not only do you have this explosion of feathers, throughout the Jurassic and the period immediately prior, but later finds demonstrated that contemporary with, and even *prior* to the development of all these sort of bird-like dinosaurs, you actually had the development of feathered creatures that look a lot more like modern birds than any of these creatures did. The so-called "fan-tailed" (**Figure 7**)—you can see the difference between the *Archaeopteryx* with the lizard tail, a feathered lizard tail, and birds that already had what we recognize as the modern fan-tail of our birds.

So your initial thought is, "Maybe the actual development of birds had nothing to do with any of these other lineages." And then the whole thing is thrown into question. What actually happens? What kind of change could happen on a planetary scale, that would cause the

FIGURE 7
Fan-Tailed Bird-Like Creatures

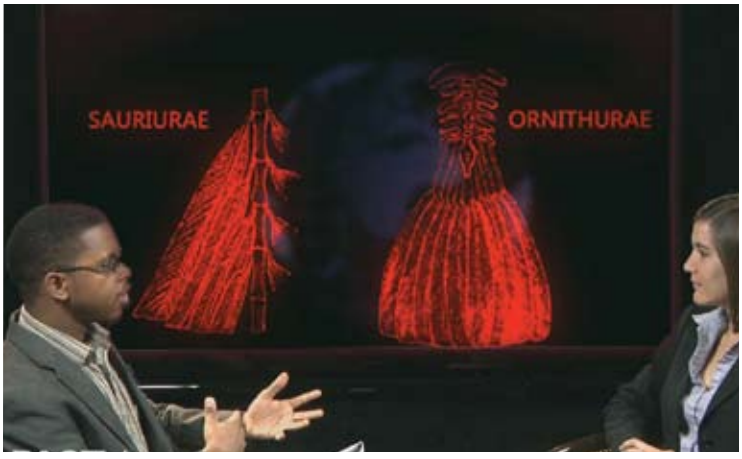


FIGURE 8
Multiple Lines of Evolution of Feathered Creatures

mass development of features like this?

Cerretani: Right, since they're all happening relatively simultaneously.

Shields: Exactly. Then you look back, and this (**Figure 8**) is sort of what it looks like: You can see these multiple lines of evolution of feathered creatures. And the standard view is sort of this: that certain of these lines seem to dead-end, and don't make their way into the present. What we'll see in a later discussion, is that it's possible that it's not even the case—this is still borrowing some assumptions from old Darwinian views. We'll see there are a number of cases, where you can see that these things likely converge and, together, become the final creature, that's being sought.

Cerretani: They're absorbed into one another.

Shields: Yes, which means that there must be some sort of process on the scale of the entire Biosphere that's determining the need for these shifts.

Now, this is the exact opposite of the free-trade model of evolution; this is the exact opposite of the idea that somehow, all these little passions of all these little creatures in the small, are involved in producing a change in the large. Because, first off, there's no benefit to be derived from any of these changes for the creatures in the small for quite a long time. Second, there's not a single creature that makes that change.

You've got to look, now, somehow, into what happens on a global scale, immediately. We'll have a later discussion of what sort of electromagnetic changes take place, on a planetary, inter-planetary, and galactic scale, that might account for this. One of the major developments with birds, aside from all the other ones that seem to be impossible to anticipate—the development of feathers and wings before you've got a creature capable of flight—is you have the loss of usable forearms. Maybe the *Archaeopteryx* has these reverse hooks on the wings, which aren't even useful for climbing; they point the other direction, the opposite direction required for you to climb a tree.

But then you also have the development of magneto-reception, which we've discussed. One of our colleagues, Ben Deniston, in our *Extended Sensorium* report,[2] has gone through, that you see in these creatures, already, the ability to respond to large-scale processes, of exactly the sort that would be capable of playing a role in mediating evolutionary processes.

Cerretani: And the case of birds is not the only case of, as they refer to it, "parallel evolution." Go back further, to this Cambrian explosion, where you had suddenly the appearance of a skeletal system, and all kinds of different sorts of critters (**Figure 9**). Again, it's not this lineage, it's not this family tree, or this clade of one group that evolves into many other different things.

2. "Magnetoreception," *EIR*, Feb. 4, 2011.

Simultaneously, around the Cambrian period, you had just the eruption, this explosion of skeletal systems and all kinds of different things. We have vestiges, a rough sketch, of the kinds of evolutions that took place. It's the same thing, it's almost as if the Biosphere was trying to force a certain upshift, so it had a number of different creatures develop these characteristics.

Shields: Unrelated.

Cerretani: Right!

Shields: There's no common skeletal ancestor that connects all these different groupings. You get the sudden appearance of skeletons. This actually greatly upset Darwin, because he realized—he was insistent that there had to be some common ancestor, you would find it. When in fact, this is *the* major appearance and diversification of multicellular life, and there seems to be *no* common ancestor between them. It's as though it were necessary for the process as a whole to begin to develop the way it did.

FIGURE 9
Emergence of Skeletal Systems

And again, you're hard-pressed to come up with an explanation, from a natural selection standpoint, that would give you the reason for these changes. What you typically get are just silly ones, you get the idea: "Well, maybe there was a period in time, where the environment became so toxically full of calcium, that all the organisms had to begin excreting it, and they just become skeletons." The problem is, not all the skeletons are calcium. There's such a range among all the skeletons, you're very hard-pressed to figure out *one* chemical environment that would result in the development of all the different types of silica, various types of calcium skeleton, and again, that it would happen in such diverse creatures.

What you do know, is that something changes on the planet as a whole, in order to mediate it. Now, we'll discuss in a later discussion, that maybe there's a close connection with the known electromagnetic properties of bone and mineral formation, which we become aware of when we're looking at what astronauts face when they leave the planet.

Reptiles Trying To Become Mammals

But along with that, roughly around the same time, a little prior to the diversification you get with the birds, you can count several attempts on the part of reptiles to become mammals, where the developments of mammalian traits appear. Now, one thing that may surprise many people, is that the various creatures we now call "mammals," are not related as mammals. They developed their mammal traits completely independently. They arise from several attempts on the part of reptiles to develop the traits that would turn them into mammals.

Now, this is a very important development. Suddenly, you get a real advance with the development of mammals: the ability to rear live young; the development of a real ability to become omnivorous, the varied teeth structures, the more advanced capability for hearing—there's a real advancement here. And it's as though, at a certain point, it were simply "time for this to occur."

And you begin to see it branch out, branch out in several forms. A lot of these die off. The three that make it to the present are the ones we know as the monotremes, or the egg-laying mammals; the marsupials, as mostly what you see in Australia; and the placental mammals, which we're familiar with pretty much everywhere else.

Curious thing about this: The actual differentiation of the marsupials into their various types, and of the placental mammals into their various types, doesn't occur until these creatures are somewhat separate. The marsupials are largely isolated to Australia; the placentals are everywhere else. But then, if you compare the different species of the marsupials to the mammals, you get a really funny thing. The first thing is, both the placental mammals and the marsupials develop saber-tooth variants at exactly the same time (**Figure 10**). Unrelated.

FIGURE 10
Saber-Toothed Placental Mammals (left) and Marsupials (right) Developed Separately

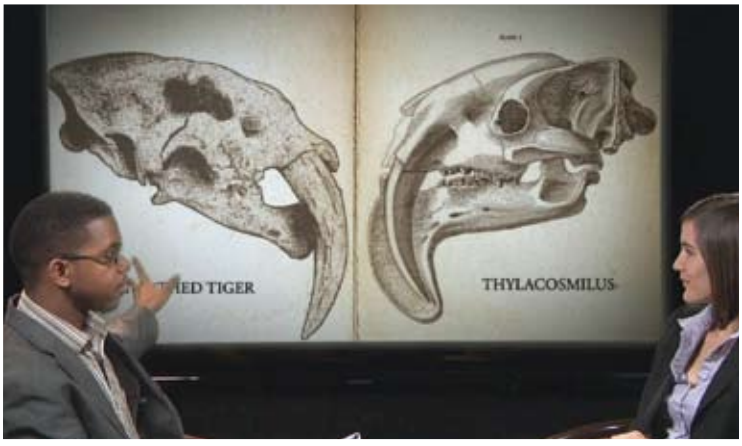


FIGURE 11
1:1 Matching of Modern Mammals (left) and Marsupials (right)

Cerretani: Really?

Shields: The saber-tooth marsupials are not related to the saber-tooth mammals.

Cerretani: They develop independently at the same time?

Shields: Completely independently. If you do a chart of modern mammals and modern marsupials, you see that this parallel is even more extreme (**Figure 11**): There's a one-to-one matching for almost every type. There's a marsupial cat and there's a placental cat; there's a marsupial dog, a placental dog; a marsupial flying squirrel, a placental flying squirrel, and these are, again, completely unrelated. It's as though it were time for this diversification to take place, and they began to do so; that as a result of some process governing the thing as a whole, you began to get this diversification.

Cerretani: Sounds like parallel evolution isn't some anomaly, but it's actually characteristic of the development.

Shields: Yes. In fact, for every major development in history, you get that. In the development of photosynthesis, you don't see some accidental appearance of some photosynthesizing creature; you can trace to the present, several seemingly completely unrelated methods of photosynthesis, different types that exist. In the fossil record, you see what look like cases of the development of creatures with this capability that just don't continue into the present.

Mankind vs. British Imperialism

Cerretani: What about mankind?

Shields: This is where it becomes interesting. Connected to this, you see two things: You see both the real, disgusting quality of British anthropology, and to what extent they want to use Darwin's version of evolution to promote, really, a racist, imperial view of history. You find, if you look at it, there's a reason that the British Empire invested so much into sending their anthropologists, their archeologists, their paleontologists to all different parts of the world, during the period of the spread of the British Empire. A lot of this was done on the basis of cultural profiling, of figuring out how you manipulate these peoples, on behalf of the British Empire. And a lot of it was done to promote a real sense of racial stratification. If you look, *everywhere* the British touched, they created an environment where you have this perceived sense of superiority and inferiority, a lot of which was argued for with a distorted version of the natural selection argument for evolutionary development.

Cerretani: Which isn't even characteristic, necessarily, of the Biosphere. It's something they imposed on it.

Shields: Right. When it gets to man, you realize what they wanted.

Now, an interesting example of this, is the appearance of Neanderthal. Now, in early lineages, in the whole Darwinian hunt for the missing link, the assumption was that every fossil you found, was part of this one, single lineage of mankind, because obviously there was this descent of man; everybody's familiar with this silly image here of the little ape crawling, and then you develop up to the spear-bearing man (**Figure 12**), and

all the funny variants on it. So, of course, the idea was that you have a development of man—Neanderthal man fits somewhere in there—prior to the development of *Homo sapiens*. But then, with further investigation, it became very clear—both because of habitat, and other types of morphological analysis—that the Neanderthal was too distinct from its contemporary Cro-Magnon man, for them to have been related.

And at this point, the British imagination goes nuts, and you get to see the real evil: You watch some of this hideous, hideous Discovery Channel video, trying to describe the interaction between Cro-Magnon man and Neanderthal, and the idea was promoted, that this other species of human being, this Neanderthal—cognitive, creative, capable of tool-making, capable of organizing its environment on the basis of a creative thought, in the exact same way as Cro-Magnon man is, was driven extinct because of some sort of "species inferiority." And they use the exact same natural selection terminology: It was "selected against," etc. And this was the dominant view. Again, you've got all these British paleontologists jizzing in their pants about the idea that they can apply this really disgusting model, even for the Biosphere, to human beings!

Then, last year, 2010, a genetic analysis—it's questioned, but—a genetic analysis showed that modern man possesses, in fact, genes from both Cro-Magnon man *and* Neanderthal. Which means, at the very least, that these two, seemingly completely distinct species, were capable of being absorbed into one another. So, rather than the extinction of one, with this weird "survival of the fittest" model, you start to see that what it looks like, is that the Biosphere determined it was time to produce man, and along diverse lineages, produced separate seemingly morphological attempts—

FIGURE 12
Textbook Idiocy About Human Evolution

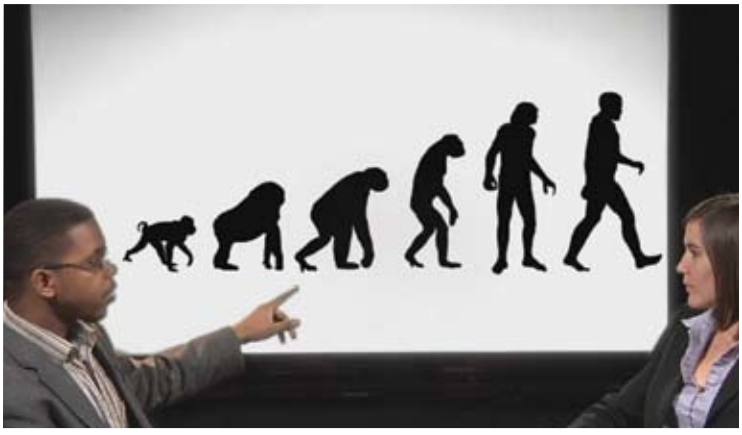
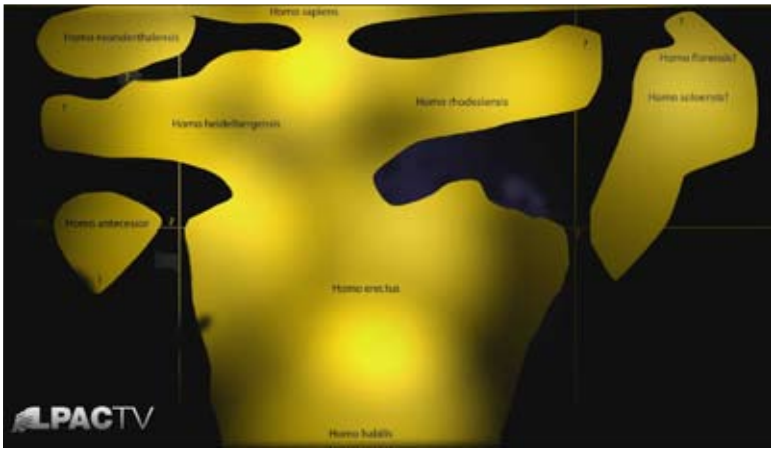


FIGURE 13
A Standard View of Human Lineages



Cerretani: Attempts at man. Attempts at this species or that species.

Shields: Right. And you see here that, instead of the other chart we had as an interpretation of the fossil record, where it looked, for the birds, like they reached a dead-end, here at least, in the case of man, in the case of Neanderthal and Cro-Magnon, we know for a fact now, there was no dead-end, but rather a convergence.

Now, the attempts, in fact, were not all "attempts"; they were all successful, and they all become modern man. So, rather than the standard view of the evolutionary tree branching outward, you have an idea of it branching inward and upward, to make a necessary shift.

It becomes more interesting: Look at the sort of the standard map here, of the development of modern man (**Figure 13**). You take a look at this, the branching upward from *Homo erectus*, up to what would seem at first to be three completely distinct branches: the development up to Neanderthal man, *Homo sapiens* up here, and we know now, again, these two are not distinct: They actually merged.

But then, roughly contemporary with these, you also have the *Homo rhodesiensis*, "Rhodesian man." This has a separate name from Neanderthal, but it's

FIGURE 14
Cycles of Biodiversity

FIGURE 15
Cycles of Biodiversity (above) and of Motion of the Solar System Through the Galaxy (below)

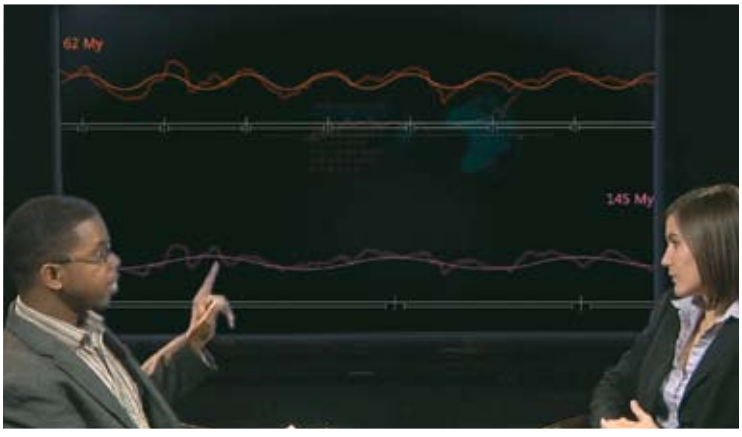


FIGURE 16
Proposed Motion Through the Galaxy

morphologically completely identical. Not related, though. Developed along completely separate branches. One doesn't branch out into the other. The only reason the different name is used, is because they appear in completely distinct parts of the planet.

So, if you really honestly look at it, then what you realize is that in various locations, the concept of the development of the Neanderthals—it was time for this to begin to happen; they are proposed by the Biosphere, and begin the development from where they were. *Again*, like every other case we looked at before, a development was being undertaken, as though there were intention driving it. In none of these, is there a single ancestor that's responsible for branching out into all of these various forms.

Cerretani: What are some of the other factors that go into biological development?

Shields: This becomes a wonderful one. Let's take a look at—this is a discussion that will include both our friend the *Archaeopteryx* and man. We'll have a lot more discussion on this, but we had an earlier video that was produced on this site, called "Our Extraterrestrial Imperative, part 2,"[3] which discussed the relationship of looking at these long-term cycles in biodiversity, in evolutionary terms, and the number of species that are alive on the planet. And it's clear that you have these ups and downs, these increases and decreases of the number of species that are all part of this upward development of speciation, the upward development of evolution of the Biosphere on the planet.

Now, the two main cycles that are in there (**Figure 14**): One is a 62-million-year cycle; another's a 145-million-year cycle. Now it's highly likely, that the 62-million-year cycle corresponds—it's been proposed, aside from several tectonic and other cycles that are on the planet, which still need to be explained, which match up to that 62-million-year cycle: They all correspond to a proposed motion of our Solar System (**Figure 15**) up and down through the plane of our galaxy (**Figure 16**), while the 140-some-million-year cycle corresponds to a

3. *EIR*, Oct. 22, 2010; http://larouchepac.com/node/16049

proposed motion of our Solar System around the galaxy, through the arms of the galaxy (**Figure 17**).

Now, if you take a look now at the major events that occur on either side of that galactic plane, or passing through the galactic plane, you find that the major extinctions (**Figure 18**) that wipe out the dinosaurs, that sets the stage for the new era of development, that's sort of that we'll refer to as the rise of the mammals, that sets the stage for man to appear, for birds to take complete control of the skies, as opposed to the earlier flying lizards, occurs right in the middle of one of these mid-plane crossings, 65 million years ago.

If you fast forward that process, another 62 million years, you have the appearance of tool-making man, *Homo habilis* (**Figure 19**), which morphologically is distinct from anything we might recognize as modern man, but contains the one characteristic that actually matters in human beings, which is the ability to organize lower phase-spaces on the basis of cognition, on the basis creativity, expressed in its ability to produce tools, which is the source of the name *Homo habilis*.

So you start to realize that the major changes on the planet—it's not a shock at all that these are global, that it's something the globe decides, because frankly, they're correspondent to processes that are, at the very least, on a galactic scale.

Cerretani: Right.

Now, if it's still the case, that the whole is not the sum of the parts, it's still becoming clearer that the parts are on a much grander scale than—forget the British anthropologist—than normally considered in modern-day economics. And this is one of these fun things, when people talk about globalization, you can tell they have no idea what they're talking about, because, when you're talking about the globe, you're implicitly talking about a globe that is bringing galactic implications into its existence, and you have this process of life, which we talked about in the "Extraterrestrial Imperative." You have life that's actually bringing these huge, galactic,

FIGURE 17
Proposed Motion of the Solar System Through the Spiral Arms of Our Galaxy

FIGURE 18
Major Extinctions

FIGURE 19
Emergence of Homo Habilis (Toolmakers)

FIGURE 20
Complexity of Our Galaxy's Structure

FIGURE 21
An Even Larger Structure: Tendrils of Galaxies

abiotic processes, and engineering them, and bending them to its will, the environment it's creating here, on the planet. Which also just flies in the face of all the reigning economic ideology, right now. Not only is it wrong, but it's just incompetent, it's dangerously incompetent, because you're *not* thinking about these factors.

Looking from the Galaxy, Down

Shields: And it gives a very different view of what the actual destiny of man is. The destiny of man is the organization of these lower phase-spaces, the organization of the Biosphere. And what it means, is, that what these environmentalists are talking about, is not trying to keep some delicate balance. The Biosphere keeps no "delicate balance"! Nowhere in it!

You've got this chaotic development to higher and higher states, as you said, both influencing, being acted upon by, and acting on, itself, processes that are on a much larger scale, the Solar System, the galaxy, *at least*. So at least, that kind of activity has to be the purview of man, at the very least.

But then, what becomes interesting, is, now you take a look at recent developments, in looking at our galaxy, and you start to realize, that our galaxy as a whole likely has a structure that's very different than heretofore thought (**Figure 20**). You take a look at what came back from the Fermi telescope, and the existence of these massive gamma-ray producing structures on either side of our galactic disk—provided our galaxy is a disk, which there's good reason to think so—this is *hugely* structured.

Again, no empty space. What was once presumed to be empty space, is not only filled, but it's structured in a very detailed fashion. You know, the reason why you're able to recognize that those are there, is the radiation: Things being produced in those regions are reaching us here on Earth, meaning they can affect us here on Earth.

When you start looking out at the other galaxies, and try to build a picture of how they exist, relative to each other in space, including us, you start to realize that we exist on these much larger filaments, tendrils of galaxies, which gives you a structure that's even larger than the galactic structure, something that subsumes even that (**Figure 21**). In that incredible organization, you've got negentropy, anti-entropy, on this massive, massive, massive scale. There is no activity that we can take, no human activity that can be really called "human," that's taken without taking that whole structure into account, at least with the idea that, ultimately, that's our destiny.

Cerretani: And that none of it is holding still. There is no maintaining, like you said, a "delicate balance." But it's one thing to recognize what it is that human beings are a part of, what we actually have the potential to act on, upon, and around, because we're fundamentally different than the Biosphere, because we can act on it.

You know, it's compelling to think of the idea that for the Biosphere, it was "time" for mankind to exist, so there was this period of "research and development,"

all these different species trying to approximate mankind. Here we are! Now to the degree that we can discover what environment we're actually a part of, we can do that. But it requires overthrowing these old, dusty, imperial, wrong axioms about what it is, the space-time that we're living in, that's just completely wrong. And the virtue of a crisis is that you have to begin to ask these questions and answer them very quickly. And you do that—this is where the role of human economics becomes incredibly important—and it becomes obvious just how fraudulent the last 40 years have been, because that period doesn't take any of this into account. That's treason! That's a fraud!

Shields: Right: It's anti-human.

Cerretani: Yes.

Shields: In this context, you take a look at what we are, and you look at something like an Obama; you look at something like the financial interests and imperial interests that control him: Anybody who's pushing for the sorts of things he's pushing for: bailing out banks, rather than defending the population; pushing for a health-care policy that's organized around making a profit, rather than pursuing the frontiers of knowledge; shutting down a manned space program; ultimately shutting down our space program entirely! The attacks he's made on fusion energy. That he's behaving as though he's a species distinct from the rest of the human species.

Now, what does this mean? If you take a look at the evolutionary development, what do you mean by "evolution," once human beings get on the scene? It's no longer characterized by morphological distinctions; as you saw, looking at Neanderthal and Cro-Magnon, the essential thing was not the morphology. The essential element of this, was the ability to express a specific species character. And the major changes in our evolution after that, came not from some physiological changes—it wasn't that we grew feathers, or hooks, or learned to scale trees, or if we didn't grow some kind of display to make our mating easier to attract the . . . you know, whoever we're looking to attract.

What we did, is we made fundamental breakthroughs in our knowledge and our understanding of the universe we live in: Those breakthroughs have effects on our species that are equivalent to evolutionary changes. Whereas other animals live *within* certain evolutionary conditions, and to change from reptiles from mammals, you have to kill off the reptiles, to produce the mammals. The equivalent change in the human species, like, say, from a feudal society, to a republic, doesn't necessarily require killing off the older—it depends on how bad the feudalists try to hold on! But that evolution can take place within the lifetime of a single human being. In fact, you can have *successive* evolutions within a single generation! The transformation is what LaRouche at one point referred to as on the level of "supergenes," as opposed to on the level of genes. That this is the development of ideas.

So, the question of the definition of us as a species hinges on what ideas, what concepts, what principles are we governed by? Somebody like an Obama, something like a British Empire, something like royalty, the feudal mindset of somebody who's promoting globalization, who's promoting free trade, is a mindset of a species that's not only distinct from ours, the human species, but the mindset of a species which is both predatory and parasitical on our species, whose survival depends on the destruction of us both.

Now, this means that the next task for our evolution as a species is to consciously act to a) eliminate that threat, to eliminate this predatory state of monetarism; but then, b) for most of us, to go in the direction that our species is actually meant to move. You know, instead of the Obama policy of shutting down the space program to try and save money, we're going to say, "Fuck the money," money is our tool. Money is what we create in order to achieve progress. What's the actual direction of progress? Only in that way, will you actually produce the wealth that's required for the human species to survive.

Cerretani: Right. And we have those immediate projects in front of us. What LaRouche has outlined with a credit system, and what this organization headed up by LaRouche has put together with NAWAPA [the proposed North American Water and Power Alliance]. Those things grew out of a tradition of the United States, because we as a nation have made fundamental breakthroughs in the vein of what mankind actually is. That's where the profundity of the American Constitution lies, and the Preamble of the Constitution: that it's actually principled. It's not some approximation, it's not an approximation of this whole history that we went through. It directly follows, and actually leads this process of development that we went through, I would say, including on a galactic level.

And it's only in straying from those things that you begin to put this whole process into jeopardy. I mean, there's the process of discovering them, but there's also willfully suppressing them, and there's accountability for that, which is what we're seeing today.