The Theory of Pleomorphic Provolution: Revisiting the Heresy of Spontaneous Generation

Abstract: *In spite of a century and a half of rigorous research, the phenomenon of bacterial pleomorphism – the ability of some bacteria to change their morphology, biology, and reproductive strategy in response to environmental cues – remains a controversial subject. The controversy has become even more profound as older theories of pleomorphism appear impossible to reconcile with modern biological knowledge. The issue is further complicated by the fact that some scientists familiar with pleomorphism conceive of it as a pressure upon bacteria to simplify in the face of adversity, while others, including Dr. Gunther Enderlein (1872-1968), describe pleomorphism primarily in terms of an emergent series of progressively more complex bio-forms. The author's Theory of Pleomorphic Provolution suggests that both of these views represent valid facets of an evolutionary process resulting from the devolution of previously evolved microorganisms. The term provolution is introduced to describe a system in which the molecular remnants of such a devolution later combine to regenerate functional, cell-like units related to the original organism. This hypothetical process is explored as a teleologically directed system with co-evolutionary benefit to the microorganism, the host in whose body these changes take place, and the larger ecosystem in which they interact.*

In spite of the provocative subtitle, I don't really believe in the spontaneous generation of life – at least, not in the way the concept is usually understood and justifiably rejected. Maggots don't spontaneously emerge from dung heaps, and dogs' pelts don't generate fleas – as even educated people were apt to believe until a couple of hundred years ago. Of course, it *is* sobering to remember that in the distant past, life on Earth must once have arisen from non-living elements – but the genesis of life is clearly not a trivial phenomenon.

On the other hand, the history of science also includes many credible accounts of life, usually in the form of bacteria, seeming to appear where it was not before present. For example, in the mid-1800s, the brilliant French biologist Antoine Béchamp found that adding sterilized, natural chalk to starch gave rise to living bacteria and active fermentation. However, when he repeated the identical experiments using chalk produced in the laboratory rather than by organic decomposition of ancient sea life, the starch was unchanged and no bacteria appeared.

The usual explanation for these and similarly provocative findings is that they are just the result of sloppy or contaminated experiments. But I question this easy assumption. Over the years, there have been so many careful experiments that share common characteristics, I am personally persuaded that something much deeper is going on. Not the ignorant, archaic conception of spontaneous generation, but something much more subtle, with potentially important ramifications both for the science of biology, and for the healing arts.

Life Between the Cracks

We tend to think about genetics in the context complete organisms. We look to the DNA in each cell as the organism's "genetic blueprint," responsible for so much of its identity and function. But that perspective, as useful and important as it certainly is, also represents a bias. I have come to believe that ecological systems, including the *endoecologies* that exist

within the tissues and fluids of our own bodies, also contain *coherent genetic information systems* distinct from, and in co-evolutionary partnership with the genomic identity of our species.

There is no rule that says that evolution only works on whole organisms. What evolution requires is a method for biological entities to change, ways to disseminate those changes, and a mechanism for those changes to persist across generational boundaries. In the Darwinian context, we usually focus on an organism's germ line DNA as the entity that changes, and on the process of natural selection to select and amplify those changes that confer reproductive advantage. But it's interesting to think about other ways in which all of these criteria can be met – what other types of *teleologically directed* genetic systems may exist, how and why they would develop, and what goals they could accomplish.

Let's start by turning this typical scenario inside out and look at the properties of the ecological systems that exist in the spaces "between" discrete cells and organisms. We usually think of the intelligence of the ecosystem as "emerging" from the coordinated and interlocking action of the organisms that comprise it, but these ecosystems may also contain critical elements that are outside of the organism's cellular boundaries. For example, viruses, phages, and similar sub-cellular genetic packages carry fragments of biological information. By piggybacking onto living cells, selected gene packages can ensure their continued presence within an ecosystem. In this view, on-going, very low-level viral "infections" may be a natural technique used to keep adequate stocks of raw genetic materials available for internal, genetic engineering.

Other structures may also have "shoe-horned" themselves into a living ecology in similar ways. Some of an organism's own genes may, for example, be unwittingly harboring the instructions to create specialized proteins or even retroviruses that have co-evolved to serve extra-cellular, even extra-organismal functions. What is interesting is to explore whether there is any valid evolutionary rationale for such systems to emerge and become self-perpetuating, achieving "closure" in terms of their guaranteed perpetuation – and also to explore if there are biological mechanisms capable of explaining how such systems, even if desirable in the abstract, might be physically possible.

The genetic elements I am hypothesizing are quite different from spores or seeds, since these already contain the complete genetic template for the mature organisms they will become. Instead, I am suggesting the existence of particles, some of which may contain fragments of genetic material derived from *previously evolved organisms*, along with molecular and colloidal support structures that can coordinate the reassembly of these elements into living or life-like forms.

The Biological Bootstrap

The computer world gives us a rather useful analogy for this hypothesis. When a computer is first powered on, it must somehow "wake up" by loading certain elements of program logic into its memory. Traditionally, this is accomplished by physically constructing the machine to load a block of instructions from a guaranteed, fixed location in memory, called the "boot block." Once these primitive instructions are loaded, they can then tell the computer where to find the remainder of the information it needs to become fully functional. This more advanced logic is called the computer's operating system, such as Windows, UNIX, Mac OS, etc.

This process – which can be very efficient and flexible – is called "bootstrapping" the computer…or just "booting," for short. It comes from the old expression about getting back on your feet by "lifting yourself up by your own bootstraps." It's an *economical* process because it requires very little "privileged" information: just a tiny block of instructions and knowledge of its pre-specified location. Occam's Razor doesn't find a whole lot to shave away here.

It's important to point out that bootstrapping is also a very *flexible* solution, because the initial block can link to just about any additional information, and *this linked information can even change and evolve over time*. In a computer, the same boot block can point to a

primitive, "glass teletype" style operating system like the old MS-DOS, or to a newer, "user-friendly" operating system like the Mac OS, Windows, or a graphic version of UNIX. The boot block doesn't care. It just points where it's been wired to point. What it finds there determines the computer's actual identity.. If new technology is invented, however radical it may seem compared to previous generations, the same, archaic boot block can trigger the process of actualizing it.

Adaptive Devolution: When Less May Be More

When we talk about evolution, we usually imagine a slow, bumpy progression, through which less complex organisms develop into better-adapted, more complex ones. We think of the organism's genome, encoded in its DNA, as the historical archive where all the successful adaptations are stored, so that they can be passed along to succeeding generations.

But sometimes, evolution produces better adaptations by *regressing* certain previously evolved characteristics – actually giving rise to phases of adaptive *devolution*. There is a type of mole, for example, that has evolved to spend its entire life underground. Its predecessors had fully developed eyes, certainly one of evolution's most elegant and complex achievements. But over time, this totally subterranean species has actually "given back" its capacity for vision. It retains only a small vestige of sight, so that it can control its mating cycle by perceiving shifts in the length of the day.

Why has this creature returned such an amazing gift, choosing along its evolutionary path to voluntarily go blind? The main reason is that the visual cortex is incredibly expensive to run – consuming about 2% of the mole's total metabolic energy. In the world of evolutionary adaptation, 2% of net energy can be a huge figure, and over time can spell the difference between success and extinction.

An even more profound example of adaptation by devolution is the case of the mitochondria that live in each of our cells, providing us with our most efficient means of producing biochemical energy in the form of ATP. It is now believed, with a high degree of confidence, that mitochondria began as independent bacteria in that long ago time when the Earth's atmosphere suddenly filled with a lethal poison called oxygen. We correctly think of oxygen as necessary to our existence, but when the biological/geological interface on Earth shifted to provide an oxygen rich atmosphere, it created a crisis for evolutionary adaptation.

At some point, a clever bacterium pioneered an advantageous solution to the global, ecological crisis. Not only did it evolve a metabolic pathway to survive the release of oxygen into a previously anaerobic world, it actually found a way to use the oxygen with incredible efficiency, producing an abundance of biochemical energy in the form of ATP.

It is believed that when a foreign cell engulfed one of these highly energy efficient bacteria, instead of digesting it – thereby killing the goose that was offering to lay an endless succession of golden egg - it began a symbiotic relationship with the new bacterium – conscripting it to live inside its walls and sharing its aerobic energy windfall. The original bacterium is estimated to have possessed about 1000 genes, each capable of synthesizing a unique compound vital to the its own function and survival. However, trapped inside the host cell, it no longer needed to quite be so smart, since the host, through managing the integrity of its own environment, would automatically provide the bacterium with a number of vital functions.

Over time, the bacterium, reproducing in lock step with the host cell, was able to devolve, shedding most of its intelligence except for its capacity for whiz-bang energy production. The devolved entity was no longer capable of autonomous existence, having surrendered the complete set of skills needed to live outside of the host cell. In fact, from its original 1000 or so genes, the devolved entity retained only about 70 – quite an amazing sacrifice. On the plus side of the symbiosis, the mitochondrion that evolved from this devolution has been spread far and wide throughout the living world – in some ways making it the most successful organism of all time. It's a different metric of evolutionary success than the one we typically apply (more of your offspring rooting around in the forest, your face on the dollar bill, etc.), but it's entirely as valid!

The Three Phases of Evolution: The Ambimorphic Paradigm

My suspicion, expressed in a concept I call *Pleomorphic Provolution*, begins with the observation that at some time in the past, previously evolved organisms – like the aerobic bacterium in our mitochondrion example – may have undergone an *even more extensive* type of devolution within the host organism. The most extreme case I can imagine would be the total devolution of the organism into a dissociated system of molecules, colloids, and genetic packages. These would retain no visible cellular attributes whatsoever, and the elements persisting within the host would not be recognized as living entities. This is a model in which the *most* complex entity, the king of the hill, would be a simple virus.

In this scenario, the devolved entities would contribute some benefit to the host organism in their guise as molecular packages. We know about comensal bacteria like our helpful intestinal flora, and devolved organelles such as the mitochondria we have just described. This hypothesis suggests that even the fully dissociated molecules and colloids would play a sufficiently beneficial role for their perpetuation to be adaptive. Indeed, Enderlein believed that the mold fungi *Mucor racemosus* and *Aspergillus niger*, in what he described as their most primitive, non-cellular states, contributed substances that participated in blood clotting and the formation of mineralized bones.

The second part of the scenario is that under some circumstances, these packages would be able to serve a different set of beneficial functions by fully or partially un-devolving, reestablishing themselves as primitive or mature cellular entities. These, of course, would be in some way related to the original organism that devolved. I suspect that provolution uses one or more specialized proteins as the biological equivalent of the computer's boot block to coordinate the cellular regeneration from the disassembled parts.

We are looking, then, at a three phase evolutionary system consisting of the original *evolution* of the organism, its co-adaptive *devolution* within the host's interior ecosystem, and its subsequent *provolution* into a regenerated life form. I refer to this whole pattern as the *Ambimorphic Paradigm*, the regeneration process as *Pleomorphic Provolution*, and usually abbreviate the whole thing with the term *ambimorphism*.

There are several thorny requirements for ambimorphism to actually work in the real world. However, none of these requirements appears to be more formidable than many other biological and evolutionary realities, including the initial appearance of life on Earth, the evolution of directed gene exchange between bacteria, sexual reproduction with its capacity for endless genetic variation, and the fusion of multiple prokaryotic cells into more advanced eukaryotic organisms.

I suspect that the elements of a provolutionary ecosystem include genetic fragments derived from previously devolved organism, persisting in the form of phages and other viroids that guarantee their continued availability within the host's body. This scenario would also require the existence of certain structural forms, evolved to coordinate the provolutionary reassembly process. These would act like a kind of super anabolic enzyme, whose substrates combine to "bootstrap" a fully or partially working cell back into existence – probably through a series of proto-cellular stages. This first, naïve model, will probably need to be fleshed out as we understand more about the multiplexing of gene function and the conditional expression of genetically encoded information through the action of energetic, as well as chemical signals. In this regard, the recent discovery that gene expression is influenced in part by naturally modulated electrical signals flowing along the double spiral DNA backbone is highly intriguing. How are these currents created and structured, and how are they influenced, in either beneficial or harmful ways, by other energetic influences?

These coordinating particles may be proteins that have co-evolved to express from within the host's own genome – or that of another obligant. Perhaps certain critical genetic elements for reconstruction may also be cached within the host's genome in the form of endogenous retroviruses. Upon expression, instead of forming a strand of messenger RNA to guide ribosomal protein synthesis, these strands would be reverse-transcripted into DNA, donating genetic elements to the provolutionary process.

I suspect that these hypothetical bootstrap elements, which I refer to as *provons*, are prion-like proteins whose conformations are conditional upon the environmental triggers favoring provolution. While not conceiving of it in these terms, other researchers have already described candidate conditions and compounds favoring the upward development of more cell-like forms. These include hormones (Naessens), pH/redox shifts (Enderlein), electrical and other energetic influences (Becker), the preponderance of D(-) versus L(-) chirality of certain metabolic acids, and a number of toxic substances, including hyper-catabolic compounds in some of our foods (e.g. D-cathepsin in crustaceans), and other environmental and iatrogenic pollutants (as in Reckeweg's brilliant theory of homo-toxicology). In fact, the pathogenic "scrapie" prions responsible for encephalopathies like Mad Cow Disease or, in humans, Kreutzfeld-Jacob Disease, Kuru, or Fatal Familial Insomnia, may result from expanding cascades of misdirected provons, originally co-evolved to serve specific and adaptive endoecological functions. Prion pathology may be analogous to autoimmune responses occurring at the provolutionary level.

Incentive and Opportunity

What evolutionary rationale could possibly exist to select and reinforce provolution as a beneficial function? I think that it's important to look at this question both from the perspective of the original microorganism, as well as from the perspective of the host. In the potential for an evolved interface between the two lies the possibility of an internal ecology endowed with enhanced intelligence and capability.

First, the entrapped microorganism – probably a fungus or bacterium – initially appears to the host as an invader. Its arrival on the scene will trigger the host's immune responses – whatever they may be. If the host destroys the invader – end of story. If the invader destroys the host – it's also a comparatively brief, if somewhat more agonizing tale.

But if the host and the invader both persist (as in the mitochondrion example), through some combination of stealth, incompetence, and mutual advantage – they may alter one another's biological destinies in important ways. If these changes can be communicated, somehow, to the host's progeny, they may well influence the shared evolution and function of their mutual endoecology.

In the simpler cases of this phenomenon, host and invader lurch uncomfortably towards a state of symbiosis, changing in subtle ways to accommodate their convergence towards mutual benefit. During this process, the obligant-to-be has a decided incentive to become less provocative to the host. The more it can avoid being pounded by the host's immune capabilities – without also undermining and killing the host, or destroying its ability to reproduce – the more successful it will tend to be in its new environment.

One way for the invader to become less provocative is for it to devolve, to begin shedding the elements of "otherness" that the host uses to identify it as an invader. While the entrapped organism has a survival *incentive* to devolve, it also has a complementary *opportunity* to do s as well. As an independent organism in the wild, it needed to provide for its own nutrition, the chemical and thermal stability of its environment, its methods of locomotion, etc. Within the ecosystem of the host, many of these activities become much simpler. Incentive plus opportunity provide two potent, interlocking factors favoring devolution for those invaders and hosts that have "decided" to try living together.

However, in devolving, the organism extends to the host something analogous to "trust." In this scenario, how can it protect itself from unexpectedly hostile shifts in the host's inner environment? These could range from the host, over multiple generations, evolving more discriminating immune mechanisms, or the introduction of new ecological competitors to the internal terrain, or even a global change in the host's external environment due to climate shifts or other factors – meteors strikes and supervolcanoes are two highly dramatic examples.

It would be helpful if the obligant in this evolving ecological interface could have, in effect, an "escape clause" in its symbiotic contract. If the obligant had a way to un-devolve back into a more autonomous form, it might not have to be a helpless bystander to the

threatening changes taking place. It could, perhaps, use some of its previously evolved intelligence to defend itself, and possibly, to actively seek new patterns of adaptation. We have not really begun to discuss how such a thing might be possible – but on conceptual level, it would be a handy option for a devolving organism to possess.

Now, let's shift our perspective to the host's point of view. Again, let's assume the interesting, non-lethal interface where, for whatever collections of reasons, host and invader are not killing one another and the result of their endoecological co-evolution is being passed to the host's progeny. This is admittedly a very small percentage of actual cases, but we have the luxury of the evolutionary time-scale to work with.

The happiest outcome in such as situation would be a robust, symbiotic relationship. The potential for the invader-turned-obligant to contribute to the host's welfare stems from its unique, independently evolved capabilities. The devolution of the oxygen-friendly mitochondrion, previously described, is the archetypal example.

As previously mentioned, I propose that some of the time, the devolutionary process extends even further, to a molecular systems level, where no vestige of the original organism is apparent – and that some of these devolved organisms can return to a living, cellular state through a pre-programmed evolutionary process.

The Venerable Dr. Enderlein

Dr. Gunther Enderlein (1872–1968), whose work will we examine in a bit of detail, believed that all mammals contained the highly devolved remnants of at least two families of invaders – originally stemming from the mold fungi *Mucor racemosus* and *Aspergillus niger*. Furthermore, Enderlein believed that each of these fungi, through the process of seeking a form in which they could exist with us in stable symbiosis, vastly influenced our evolution, especially in the areas of complex skeletal development and the self-healing, through clotting, of our circulatory system.

But for Enderlein, this sword had another edge – one that he perceived as a medical disaster. However, seen through the filter of the Ambimorphic Paradigm, we can understand the same facts in a different way. What appeared to Enderlein as the tragic origin of chronic illness can really be seen as the misdirection of an important ecological adaptation. What's more significant is that if this perspective is correct, it may well give us one of the most powerful tools imaginable to influence our own health and healing. Let's start by filling in a little background.

Through many years of painstaking research, Enderlein came to believe that our body fluids, such as blood plasma, lymph, and cellular cytoplasm, contain particles that can be induced to reorganize into more complex biological forms, ultimately giving rise bacteria and fungi not previously present. Of course, this notion is reminiscent of Béchamp's experiments conducted more than half a century before. Enderlein called this phenomenon *probaenogeny*, and made it a cornerstone of both his theoretical and clinical work in pleomorphic microbiology. Clearly, it is this phenomenon – one that I believe Enderlein could not adequately explain with the tools at his disposal – that I hope to decode with the Ambimorphic Paradigm and the hypothesis of provolution.

Enderlein demonstrated that beyond a certain level of developmental complexity, all the emergent pleomorphic forms leading towards *Mucor racemosus* or *Aspergillus niger* were pathogenic and degenerative. In fact, Enderlein argued that it was the conversion of the benign, devolved forms of these fungi into their pathogenic, cellular forms that constituted the deepest roots of all chronic illness. Enderlein demonstrated ways of understanding challenges as diverse as cancer, diabetes, tuberculosis, and glaucoma as different facets of the same types of internal, pleomorphic imbalances.

In particular, the mature bacterial and fungal expressions that Enderlein isolated from the blood of diseased individuals were highly saprophytic – both promoting and nourishing themselves from organic decay within the body. He went on to describe the original invasion

of these two molds into our ancestral chain as the "…greatest medical tragedy in evolutionary history."

A Double Edged Sword

Nature is parsimonious. All ecosystems have mechanisms – often central to their architecture – for scavenging and recycling dead organisms and waste materials. If the fallen tree in the forest were not soon returned to the soil through the action of countless saprophytic fungi and bacteria, nothing new could ever find sufficient nourishment to grow. It was, in fact, largely due to the cycle of biological conversion of inorganic materials, and their subsequent recycling into new life, that our rich biosphere on Earth first developed.

So – what if the eventual ecological interface arising between our ancestors and one or more original invaders – such as *Mucor* and *Aspergillus* – formed a highly adaptive, two-phase system, as follows?

During the first phase, during the time when we are healthy and productive, the highly devolved, molecular and colloidal remnants of these organisms would actively contribute to our welfare in specific ways. For example, Enderlein believed that the primitive phases of *Mucor racemosus* contributed essential elements to the process of blood clotting. The emergence during devolution of a vascular self-healing function could have triggered a huge evolutionary leap for the host – allowing it for the first time to safely develop a complex and extensive circulatory system. This sort of imported, unexpected benefit could be one explanation for some of the non-linear bursts of evolution that are referred to as periods of "punctuated equilibria."

Now, let's suppose that upon the death of the host, the second phase of the interface is activated through the process of pleomorphic provolution. In this phase, the primitive, non-cellular components of the devolved organism would begin to reorganize into increasingly life-like forms, culminating as autonomous, highly saprophytic organisms. This would encourage a rapid decay of the host's tissues, quickly recycling them into the greater ecosystem. What is even more interesting is that many of the molecular elements entrained into the provolved organisms would be the very same ones that during life had been engaged in beneficial, symbiotic activities.

When the appropriate set of environmental triggers activates the recycling of a dead organism, the result is a potent benefit to the ecosystem. It translates into an efficient, accelerated decay of a dead organism and the subsequent enrichment of the terrain with valuable nutrients. But, if the triggering mechanism is somehow activated *prematurely*, while the host is still alive, it would create an internal onslaught of pathogenic, endotoxic recyclers *inside the body*.

But how does the *saprogenic system* (namely, the creation of internal recyclers through provolution) know when an organism is actually dead? Probably through an interlocking set of biochemical and energetic parameters – many of which have been empirically discovered and utilized within various systems of natural and nutritional healing. When the parameters fall within a certain range, provolution is discouraged, and the creation of active, *counter-provolutionary regulators* is encouraged. On the other hand, when the inner terrain falls too far out of balance in too many ways, the opposite conditions would apply. Provolution would be actively stimulated, and the creation of regulators would be inhibited – exactly the right scenario for a dead organism ripe for recycling. One of the difficulties for 21st Century *Homo sapiens*, however, is that a combination of environmental, nutritional, and medically induced imbalances seem to mimic the triggers that provolution uses to discriminate between life and death – between the symbiotic phases of the devolved obligants, and their otherwise adaptive, saprophytic actions. The living phase where the devolved obligant assists the individual – and the *post mortem* phase, where the devolved obligant serves the community by nourishing the coming generations.

Seen in this light, the provolved saprophytes are not evil – they do not deserve to be the targets of medical ambush and onslaught. Instead, we need to learn how to refocus the communication within the internal ecology, and reverse the saprophytic trend. This is

complicated by the fact that a great many forms of medical intervention – which locally efficacious – often increase the matrix of imbalances that the provolutionary process uses to make the determination of death. Cancer chemotherapy and radiation, for example, amplify the very pH and redox imbalances that are conducive to neoplastic growth!

This hypothetical two-phase system is neither good nor bad – it has what evolution likes – the potential to be adaptive. By analogy, fire is a good thing when it's warming your house and cooking your food. But fire can become a bad thing when it jumps onto the curtains and burns your house down. Provolutionary recycling is a boon for the ecosystem – and dead organisms don't care how fast they decompose, while those yet to be born may benefit from the efficient recycling of nutrients into the world they inherit. On the other hand, living organisms with severely degraded inner ecosystems may experience a increased biological pressure to die quickly. In the wild, these organisms may well be a drain on living populations. They may be more beneficial to the overall ecosystem as "earthfood" than as weakened, unproductive community members.

On the other hand, we humans value our lives by a different metric. Putting aside the practice of setting enfeebled Inuit elders adrift on ice floes, human beings put a premium on our individuality. When our inner systems become contaminated, we want to find ways to fix them, to heal the conflicts. So we try to think deeply about how to get out of the hole of ill health. Mainstream Western medicine tends to focus on the individual factors that have gone awry, looking for ways to bolster, repair, or compensate for them. In contrast, I have coined the term *EcoBiotics* to describe the attempt to influence our health through applying the lessons of evolutionary ecology.

In his work, Dr. Enderlein identified specific biological forms – non-cellular packages related to the devolved fungi – that work as natural regulators, keeping the degenerative, second phase of this provolutionary process in check. In the second phase, whether these regulators are suppressed by shifts resulting from actual death or from the severe endoecological imbalances that mimic death, it falls to the "immune system" to try to deal with the resulting explosion of provolved organisms.

But our immune systems have evolved to detect and control threats from *outside* the body, not those arising from within. Furthermore, there may be inherent histocompatibility and other immune system issues that prevent some of the provolved forms from being recognized as pathogens.

In a healthy person, the immune system works in a constant, gentle cycle of surveillance and clean up – occasionally gearing up to deal with a breach of its perimeter defenses. But when the immune system is forced to work at a sustained, heightened level of activity, countless physiological problems invariably arise.

For openers, intense immune responses are resource intensive, and divert nutrients and energy from other systems of the body. As an occasional adaptation to immunological stress, this is fine. But as a normal way of life, it's devastating. Phagocytes, for example, are hungry for electrons to create the energy gradients needed to kill fungi and bacteria. This activity diverts electrons away from efficient mitochondrial production of ATP, and from proper polarity maintenance in the nervous system.

Heightened immune system activity not only depletes what in Traditional Chinese Medicine is called "chi," it also pollutes the body with oxidative byproducts, putting further strain upon anti-oxidant and free radical blocking systems. This opens the body to additional wear and tear and more profoundly, to *worsening the very same biological parameters whose degradation triggered the provolutionary phase in the first place*.

In his work – which he conceived of quite differently from the ideas of ambimorphism and provolution that I am presenting here – Enderlein describes some of the natural checks and balances that suppress this internal degeneration. In particular, he describes the development of specific pleomorphic variants that cause the higher forms within their own species – I would call them the most fully provolved forms – to completely regress back into non-cellular, colloidal elements. Enderlein called this process *isopathic regression*, and his

"fungal phase" remedies were designed to enhance the body's ability to create these natural regulators.

A great deal of controversy currently exists, even among those who have experienced the clinical efficacy of these regulator remedies, about how they actually work. Another short paper, *An Open Letter On Pleomorphism – Unbundling the Enderlein Legacy* addresses some of the elements of this controversy.

EcoBiotics: A Therapeutic Paradigm

The other important aspect of the ambimorphic -provolutionary model is that it suggests a biologically based approach to therapy. This is the work I previously mentioned called EcoBiotics – derived from the fusion of the words Biology, Ecology, and Dynamics. Unlike most natural and holistic approaches to health – many of which are wonderful, effective, and highly evolved systems - EcoBiotics stems from the rational intersection of the Ambimorphic Paradigm with pioneering work in other areas of non-traditional biology and medicine, including homotoxicology, biological terrain, metabolic nutrition, and structure/energy integration.

While the application of EcoBiotics is as much an art as any other approach to healing, it is very easy to express, in general terms, how the EcoBiotic process works. In-depth seminars in EcoBiotics, including training in an advanced form of pleomorphic live blood analysis called DIAD Microscopy, delve deeply into the theory and practice of these subjects.

The basic steps in any EcoBiotic program are as follows:

1. Step 1. Identify and begin to reverse the factors stimulating provolution. These include the presence of certain toxins, shifts in pH, redox, and electrolyte differentials of various body systems, chronic exogenous infections, imbalanced dietary and metabolic factors, chronic stress patterns, etc. Many methods exist for identifying and rectifying these problems

2. Temporarily support the over-stressed immune system in its necessary, but ultimately futile battle to fight internal provolution as though it were an exogenous infection. This includes factors for general immune stimulation, targeted techniques of immune enhancement, and cleaning up the oxidative stress and other toxic byproducts of unnaturally sustained immune activity

3. Use DIAD (Differential Isopathic Assessment in Darkfield) to both identify and quantify the provolutionary influence of various devolved fungal species within the body. From this information, build a precise strategy and therapeutic sequence for restoring enhanced ecological regulation. The key therapeutic tool for this phase is the proper use of the fungal colloid remedies originally developed by Schmidt,. Enderlein, and their contemporaries

4. In concert with these other activities, work to support the critical organs and pathways of elimination that will be stressed by detoxifying and rebalancing the internal ecology. These organs may already be chronically weak, and in various phases of symptomatic distress that require special care and support. This step may also involve specific strategies to flush out intracellular toxins

5. Work with the individual to develop the enhanced consciousness, sense of belonging, compassion, and gratitude that attract and reinforce a positive self-image and connection with life – both human and microbial. This is not a matter of religious belief, though some may choose to approach it in this way. Rather, it is aimed at creating a clear and vital sense of self – which is the foundation for everything we ask our bodies to do in support of our physical existence. Lifestyle choices, including stress management, exercise, diet, and meditation, as well as subtle manual healing

arts, such as craniosacral and visceral therapies, are often powerful facets of this process

EcoBiotics: A Work In Progress

Clearly, both the theoretical and clinical facets of EcoBiotics constitute a work in progress. One of the greatest challenges in this task is that the phenomena are so complex, and the concepts needed to explore them are often so far from accepted avenues of knowledge that it becomes difficult to communicate, even with cherished colleagues. In short, we lack a common language, or even a common *agreement* about the phenomena themselves.

Because of my background and research in the field, I have a natural tendency to think about pleomorphism as the *upward* tendency for molecular systems to reorganize into cellular forms – a kind of *cytotropism*.

But others within the field, especially those trained in medical bacteriology and molecular biology, tend to think of pleomorphism as the *downward* pressure exerted on living bacteria by antibiotics and other environmental influences. These researchers, such as Lida Mattman, focus on how bacteria change their form to escape detection by the immune system, or how they adapt in the face of chemical and environmental adversity.

The *Ambimorphic Paradigm* encompasses both sides, recognizing the pressures for pleomorphic devolution, as well as the capacity for subsequent provolution, as a series of teleologically linked events. Whether the particular ideas expressed here are substantially correct, partially correct, or even totally off-the-wall, it is my hope that we continue to think creatively about these deep issues, rather than sweeping the phenomena under the rug. My most fervent wish is that we approach one another as allies with information and insights to share – not as competitors working to "debunk" each other's muddle-headed thinking. I have, for instance, sat through too many talks "disproving" the value of homeopathy because diluted solutions no longer contained molecules of the original substance. No one who has worked with homeopathy thinks that's how it works. It's like saying, "I can prove that radio you gave me is a hoax. I opened it up and there weren't any tiny musicians inside."

Anyone who looks deeply into the bubbling cauldron of life on Earth must come away humbled. Those of us who work with these challenging concepts, especially in the world of healing, have seen so many realities that just don't fit neatly into the central paradigm – we know that something fundamental and extremely interesting is going on. So why don't we join our hearts and minds and see where the realities lead us? Einstein once said, "Everything should be made as simpler as possible – but not simpler."

The evolution and perpetuation of life on Earth are *not* simple. Let's remain open to the challenges, while we resist the temptation to reduce these magnificent and multi-faceted phenomena into something "simpler than possible." Thanks.

Some Recommended Readings

Becker, Robert O. – *The Body Electric – Electromagnetism and the Foundation of Life* (1985), *Cross Currents, The Perils of Electropollution, The Promise of Electromedicine* (1990)

Enby, Erik; Gosch, Peter; Sheehan, Michael – *Hidden Killers – The Revolutionary Medical Discoveries of Professor Guenther Enderlein* (1990)

Enderlein, Gunther – *Bacteria Cyclogeny* (1925, English Translation 1998)

Grace, Stuart – *An Open Letter on Pleomorphism – Unbundling the Enderlein Legacy* (2001)

Hume, Ethel Douglas – *Béchamp or Pasteur? A Lost Chapter in the History of Biology* (1923)

Lynes, Barry – *The Cancer Cure That Worked – Fifty Years of Suppression* (1987)

Margulis, Lynn – *Symbiotic Planet* (1998), *Five Kingdoms: An Illustrated Guide to the Phyla of Life on Earth* (1998), *Microcosmos – Four Billion Years of Evolution From Our Microbial Ancestors* (1997)

Mattman, Lida - *Cell Wall Deficient Forms: Stealth Pathogens, 3rd Edition* (2001)

Pruisner, Stanley B, - *The Prion Diseases*, Scientific American 272(1), 48-51 (1995), *Human Prion Diseases and Neurodegeneration*, Current Topics in Microbiological Immunology, 207, 1-17 (1996). Note: A large amount of current and historical information on prion biology and pathology can be found on the Internet at
www.mad-cow.org including an archive of more than 7,000 articles and studies

Reckeweg, Hans H. – *Homotoxicology – Illness and Healing Through Anti-Homotoxic Therapy* (1980)

Rife, Royal Raymond – Various research papers, laboratory findings, newspaper articles, and current research studies are published on the Internet at www.rife.org A newly discovered set of audio tapes documenting Rife's conversations with his associates is available from the Kinnaman Foundation at (970) 249-0859

Sonea, Sorin; Panisset, Maurice – *A New Bacteriology* (1980, English translation 1983)