Sense and Significance in Phylogenetic Reconstruction

A Commentary on Arne Raeithel's "Symbolic Production of Social Coherence"

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No one interested in the origin of the human being will fail to be captured by Arne Raeithel's sweeping *storia.* The motifs he paints on the canvas of human ascent - sketchily and in broad strokes - have an intuitive attraction that makes the vision ring true. Some sort of aesthetic judgment is involved here, and I believe aesthetics to be related to truth in some deep and imponderable way. To me, the beauty of the story told, points to its truth, at least until that point in the narrative where I feel a jarring of my sensibilities.

The phenomenology of reception raises some interesting questions about the criteria by which phylogenetic reconstruction is to be judged. Does the subjective sense of meaningfulness of the narrated events, by themselves, speak of the objective significance of these events? Is retelling the same as explaining? What constitutes evidence, and what constitutes explanation in phylogenetic reconstruction? My commentary will try to develop this line of questioning.

Turning Vygotsky

The proper starting question is, Does Raeithel fulfill his intentions? I believe his story is intended to do two things simultaneously: (i) To convince, by exemplary demonstration, that symbolic processes of social intercourse play an essential role in human evolution, thus *advocating* a shift in emphasis in the tradition of anthropogenetic thinking to which he belongs; (ii) To *account for,* through specific hypotheses, *how* and *why* the evolution of culture and communication actually happened.

That Raeithel succeeds in his general demonstration is plainly evident. By presenting his story, he makes clear the prime importance of "so-called subjective factors." He also substantiates the claim that the secrets of human evolution should be sought in the

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complexities of symbolic, social intercourse, as much as in the rise of intellect or material production. He talks about turning Vygotsky. Thematically put: Let us not only see language as a tool, let us see tools as language. Which, by the way, is quite Vygotskian in its recognition that the tradition of humanist science from Herder to Habermas holds insights indispensable for a deeper understanding of the origin of humankind. For Raeithel this insight is wrapped up in the theoretical notion of "the distinct and reproductively closed activity system." This notion is very strong, and should be added to the vocabulary of anthropogenetic theory.

These merits do not stand or fall with the correctness of Raeithel's specific proposals as to the concrete road taken by emerging humankind. It is to this latter account we now turn. We will concern ourselves with the first stages only. I summarize them for easy reference.

Raeithel's Story Summarized

The **overture** to Raeithel's story begins a couple million years ago, when African protohumans (Australopithecines and *Homo habilis*) have already left the ape-stage. Physically they conduct themselves as we do. They have upright gait, free hands, and the ability to use these hands to work with implements and to carry things. They presumably have home bases, and extensive food sharing. Their life is not entirely controlled by the specifications of their biological nature; it is also controlled by a socially mediated proto-culture. Through vocal signaling they can ensure cooperation from their group. Different groups have developed different ways of doing things, *styles*, which serve to secure group coherence and thus to enhance survival ability. They also serve as a cultural reproductive barrier, offering natural selection a speedy way to reinforce the most fit cultural styles. Decisive for the transmission of these styles is the ability and eagerness of the young to imitate the ways of the elders. The capacity for imitation is also heavily selected for. The protocultural way of life is not only strengthened by genetic fixation, it is also buttressed by incorporating physical means (tools, containers, shelters) into the cultural styles, serving as an external memory. The means, therefore, not only serve their express purpose, but also enhance the reproduction of social coherence through the cultural styles.

The **first act** begins in a time of climatic change caused by glacial advance in the Northern hemisphere. The protohuman has now become *Homo erectus*, who - being a hunter - is prone to wandering. *Homo erectus* spreads to Europe and Asia. Rapidly shifting habitats present *Homo erectus* with "the necessity or challenge to invent radically new patterns of productive activities," Raeithel says. He mentions stone tools and fire. Under the condition of rapidly changing circumstances, the inventive group has to stabilize its new proto-culture in a shorter time span and in a more precise way than before. For this, the old, and somewhat casual, imitative transmission is insufficient. A new function is needed. "The old ability that acquired a new function," was the co-imitation, or reciprocal imitation already present in apes. It is now turned into co-*imitative teaching*, where elders intentionally get the young to imitate things performed. Only groups who manage this process can successfully face changing circumstances, which explains why it is heavily selected. Co-imitative teaching is supplemented by complementary or parallel imitation, where individuals take turn imitat-

ing events. Raeithel calls this the *invention of dramatic communication.* It is a way to communicate individual experience to the group, and through this practice a collective dramatized memory is built, which, through institutionalization, further secures the coherence and identity of the group. This collective drama also serves as collective anticipation, because activities of the future can be worked out in advance. The institutionalization and ritualization of collective memory, however, have the drawback of being extremely conservative, a hindrance to new invention.

In the **second act**, where *Homo erectus* has slid into archaic *Homo sapiens*, this conservatism becomes a serious problem as the climate acts up again, owing to a new glacial period. Food resources become erratic, and the need for dramatic communication in keeping the world together rises steeply. Even during working hours such communication becomes necessary, but the humans "could not dramatize their fantasies while being at work, because you can either be productive, or stage a drama," Raeithel says. Again a new function has to be invented. Again old abilities have to acquire a new function. The old ability was a primitive, vocalized operative language, which for unknown reasons had developed sometime between Australopithecines and archaic *Homo sapiens*. This operative language, similar in syntax to the toddler's, and serving situation-bound practical ends only, now takes over the functions of drama, giving rise to genuine discursive language with developed syntax. Heavily selected for, this new invention leads to a restructuring of the forebrain. The change from dramatic to discursive communication drastically changes the pace of invention because the rigid conservatism of the old mode is replaced by social learning through creative play with vocalized language. The bright and playful *Homo sapiens* of the French caves is being born.

Notions of Truth

The first and obvious question here is, Is this story true? Does it correspond with fact? It goes without saying that you cannot make a direct comparison between a historical event and a theoretical reconstruction of that event. The first is no longer present and cannot be reproduced. Correspondence can only be established with the traces left by the event. In anthropogenetic reconstruction there are two major kinds of fact that any theory must accommodate. First, there are the essential characteristics of the human being, the essential characteristics of the ape, and the *difference* between them. This difference was produced in evolution, and constitutes the factual basis of anthropogenetic reconstruction. A reconstruction that is unable to account for this difference, has failed. Second, there are the fossil and archeological traces of the process itself. Unfortunately, they are scant, and therefore likely to be unrepresentative. (That hunting accidentally leaves more traces than gathering has led, for example, to a biased view of human evolution.)

While the fossil and archeological evidence must be accommodated by any theoretical reconstruction, it does not speak for itself. It must be interpreted, and being meager, it allows for quite diverse interpretation. The difference between ape and human is a substantial objective datum, but it needs to be correctly identified. Before you can explain the difference, you need to assess the difference correctly. For this reason, we cannot understand

anthropogenesis better than we understand ourselves. Different conceptions of human nature consequently have led to different accounts of anthropogenesis: Rousseau's intelligent entrepreneur, Engel's tool-user, Dart's killer, Leont'ev's cooperator, Wilson's con artist, Lovejoy's loving husband, Richard Leakey's social idler, the responsible mother of Morgan - and myself.[1] To some, these divergent accounts turn anthropogenetic reconstruction into a quagmire of ideological speculation that ought to be shunned, but that is quite nonsensical. Anthropogenetic reconstruction is the attempt to explain how we came to be, what we are. There is no way it can get around the problem of explicating what we are.

Raeithel's story conforms to the facts; it accommodates the fossil and archeological evidence, and its notion of the difference to be explained (culture and symbolic communication) appears quite appropriate. Still it seems difficult to apply the notion of correspondence truth here, the facts being so indefinite and pliable. It might be better to apply the notion of coherence truth, and ask whether Raeithel's story makes sense or gives meaning.

Is freedom of logical contradiction all there is to coherence? No, of two logically possible anthropogenetic stories, one could make more sense than the other. Thus, it is recognized that accounts that draw together more explananda than other accounts are more coherent. A variation of this line of reasoning is reliance on the explanation that unexpectedly explains more than was asked for. The explanation of *x* gives you the explanation of *y* into the bargain. I consider such unexpected gifts one of the most important measures of veridicality in anthropogenetic reconstruction. Perhaps it is the substitute for verification in this field.

This line of reasoning, however, does not exhaust the measures of coherence, there is another yard stick as well. Although Raeithel's story, as it stands, does not contain unexpected gifts, it is rich in this measure. I am talking about the intuitiveness alluded to in the opening. It has something to do with intelligibility, and is a fundamental test of the accuracy of anthropological reconstruction. The account should conform to some *deep practical* logic, put you on the very scene of the events, so to speak, and draw upon all your tacit knowledge of living. It should be sensible in the literal sense that you could sense it, see it, feel it, know it. This intuition is difficult to write about since it is preverbal, but it forms the rock bottom foundation of all knowledge. If it says no, no fancy word-work can remedy it.

Raeithel's descriptions are - in long passages - rich in this intuitive quality. His account of *styles*, for example, is right on. You can vividly sense them as if you were there, and you are left in no doubt that this happened. Similarly, you can easily envision the imitative practice of the youngsters, and you can sense the growing apprehension of the elders, leading to intentional interference and thus co-*imitative teaching*. Also his account of *dramatic communication* shares in this quality. These ideas belong in any future anthropogenetical theory.

At this point a question crops up, however. The sense of the narrative, here emphasized through notions of sensuous concreteness, direct vividness and immediate intelligibility, is the sense of an eye witness. Granted that an eye witness to the human evolution would be invaluable, one should still ask if eye-witnessing alone solves the task of anthropogenetic

reconstruction? A simple analogy says no. Our generation witnesses radical social changes. From the personal point of view each of us can tell what happens and how it happens. But why it happens, the causes and significance of events, leaves us grappling. Eye-witnessing is not understanding. Retelling is not explanation. Anthropogenetic reconstruction must explain, let us therefore turn to the explanations in Raeithel's story. Let us begin by recounting four types of explanation influential in the history of the theory of evolution.

Evolutionary Explanations

Adaptationism. The first type of explanation we will call adaptationism. It is the explanation of Darwin, and says that bodily variation within a species through the mechanism of natural selection keeps plants and animals adapted to a changing environment. "As natural selection acts solely by accumulating slight, successive, favorable variations, it can produce no great or sudden modification."[2] Consequently, adaptationism admits of no discontinuity between animals and humans, but only difference in degree.

Rubiconism. The second type we will call rubiconism, in honor of the famed paleoanthropologist Sir Arthur Keith who proposed a wonderful solution to the qualitative difference between the ape and the human being. It is called The Cerebral Rubicon because it claims that upon reaching the brain volume of 750 cc, the ape mind suddenly turns into the human mind. Rubiconism recognizes great and sudden transformation in evolution, and therefore admits of a difference in kind between animals and humans.

Rubiconism shares this insight with **Creationism**, which since time immemorial has invoked godly intervention to account for the unique character of the human being. The early recognition of this distinction was quite precise, as shown by the epic of Protagoras.[3] Animals are *Epimethean* creatures; that is, their specific nature is constituted of inborn and fixed bodily properties according to their kind. Humans are *Promethean* creatures; that is, their specific nature is constituted of non-bodily or artificial properties. The ability to make and use tools, the ability to speak, and the ability to form complex social organization, are named by Protagoras.

That the empirical distinction of the human being limits the universality of natural selection, was realized in 1864 by Alfred Russel Wallace, who had slipped in and independently discovered the writing of *The Origin of Species*.[4] Wallace wrote: "Man, by the mere capacity of clothing himself, and making weapons and tools, has taken away from nature that power of changing the external form and structure she exercises over all other animals."[5]

Wallace, however, left open a passage between the disparate worlds of animal nature and human culture. Decisive in Promethean life is the mind, and the mind is subject to bodily variation (growth of intelligence and enlargement of brain), hence also subject to natural selection. Relieved and grateful, Darwin in 1871 wrote *Descent of Man*, which aimed to prove that all unique human mind-like properties differ only in degree from similar animal ones. Although in lesser degree, parrots have language, dogs religious sentiment, etc. (In the aftermath the book motivated Lloyd Morgan's Canon.)

Less luckily, it also spawned the notion that human races are different stages in the evolution of humankind. Wallace would have nothing of this. Recalling a youth spent with the Indians of the Orinoco river, he denied that some humans are closer to the ape stage than others. Against Darwin's difference in degree, he insisted on a difference in kind. Unfortunately he knew no better recourse than to refer the explanation of this discontinuity to the work of "some higher intelligence."

Today he could have referred to emergence, the common notion that upon reaching a certain critical state a system acquires completely new properties. Or, he could have referred to the law of the transformation of quantitative into qualitative changes, prominent in dialectical materialist philosophy. In Friedrich Engels' *Dialectics of Nature,* Hegel's example of the sudden transformation of water into steam upon reaching 100C is cited as paradigmatic. But Wallace would not have liked Engels' book. It chastises him as scientist; and the enclosed account of the evolution of humankind from the apes, identifies not a single dialectical leap to justify a difference in kind. It stays true to Darwin's canon: *Natura non facit saltus,* and tells a story about how the freeing of the hands, labor, intelligence, tools, social cooperation, and language in a protracted series of gradual steps have lead from the ape to human civilization. It is a near duplicate of the classical stories of Lucretius and Rousseau, usually counted as mechanical materialist, explaining by gradual addition. It could be called insidious emergence, if this was not a contradiction in terms.

I mention this because the high priority of functional- historical reconstruction of phylogenesis in Marxist philosophy and science dates from Engels' work. The ape-human transmission was a preoccupation of Lev Vygotsky. The main work of his student A. N. Leont'ev was devoted to a reconstruction of the phylogenetic evolution of activity and mind, where the arrival of the human stage is especially emphasized. Inspired by this, the magnum opus of Klaus Holzkamp is a similar, rather meticulous reconstruction. They all form the backdrop of Raeithel's reconstruction.

Accidentalism. The third type of explanation we will call accidentalism. It refers to fortuitous genetic change, and follows from the discovery of genetic recombination by Mendel and the discovery of genetic mutation by De Vries. It can serve evolutionary change in two ways. Most importantly, it saves Darwinism, which was thrown into confusion when it was discovered that natural selection could not explain the coming into being of anything new, however slight, because natural selection only works upon that which is already in existence. To say that something came into being because it was needed, or would be advantageous, would falsely turn natural selection into a teleological agent. With small, but continuous genetic innovation providing the source of new variation, natural selection, however, works fine and explains the continuous honing of functions to the demands of environment. This synthesis of genetics and natural selection is called Neo-Darwinism.

Besides providing a source of gradual change, genetic accidents could also provide a possible mechanism of radical change. Mechanisms generating such change are called for, because sudden transformations are definitely revealed in the strata of the fossil record, and substantial innovation is richly documented in the sharp parceling of zoological taxonomy.

From this evidence, it seems that evolution proceeds from plateau to plateau. Darwin's theory can account for the gradual adaptation within the confines of a plateau, but it cannot account for the sudden shift from one plateau to another. Freak genetic accident could be such a mechanism that, turning the table of gradual evolution, provides truly new forms. The weird micro-fauna of the Burgess Shale could be a case in point.

Inventionism. Accidentalism need not be the only change-generating mechanism operative in evolution, which brings us to the fourth kind of explanation. We will call it inventionism.

Prominent until the advent of Neo-Darwinism, now nearly forgotten, was the recognition that phenotypical change can induce genotypical change, the so-called *Baldwin effect*. This means that behavior, which is a phenotypic trait, in principle can pilot the course of evolution. If an animal learns a new way of doing things, and if this learning is kept up for some generations, natural selection will select for morphological traits that are fit relative to the new way of doing things. Natural selection, too, is taught by learning. If a species of bird learns to fish, natural selection will select for fishing.

Learning behavior as a possible evolutionary pilot, introduces mind, and therefore teleological agency, as a directive force in evolution. What would be the range of this force? In the case of habituation, classical and operant conditioning, it would be slight indeed. With the development of mammalian insight learning it would gain a certain leverage, and with the learning modes of humans it would, of course, be appreciable, even decisive. It could circumvent natural selection. This was Wallace's point. We will call all mind and behavior induced changes inventionism.

I believe that *adaptionism, accidentalism, inventionism,* as well as *rubiconism,* are all operative factors in evolution; further, that they can be operative simultaneously, working in concert. Being the odd one out, rubiconism needs a word. It does not refer to a specific mechanism such as mutation, natural selection, or learning. Rather, it tries to identify the sudden shifts in the logic of relations that turn the table of evolution. Since these shifts represent the truly new and unexpected, there will be no standard explanation of rubiconism. Each concrete case will be unique.

Within the Compass of Inventionism

Inventionism is the key explanation in Raeithel's story. Inventionism has the initiative, piloting adaptationism that in turn needs the support of accidentalism. The protohumans learn new ways of doing things which become heavily reinforced by natural selection in tune with the provision of genetic variance. In the later stage of human ascent, inventionism becomes nearly independent as cultural transmission takes over functions of biological transmission.

No sudden emergence, or turning of the tables, is spoken of. Raeithel explicitly applies the standard explanation of functional adaptation. The major invention of his first act (co-imitative teaching), and the major invention of his second act (language), are both cases of "old abilities that acquired a new function." Adaptive shaping in easy steps, rather than radical emergence, is portrayed.

While rubiconism, accidentalism and (proper) adaptationism invoke no agent, inventionism implies an inventing subject. The instigator of the change is a living animal engaging its world through behavioral activity and psychological competence. Contrary to the freakish and intangible work of accidentalism and rubiconism, we feel quite familiar with inventionism. Being subjective agents ourselves, we are able to take the place of the inventor. This is why the explanation of inventionism so easily appeals to our sensibility.

Tied to the purview of the living agent, inventionism limits itself to evolutionary change that can be made by individual subjects (and therefore in principle be eye-witnessed). Inventionism, therefore, usually is understood as problem-solving. The constraints of problem-solving are given with the formula of problem-solving: (i) Some change introduces a problem in the customary way; (ii) the problem is recognized, at least in the form of a need; (iii) some already present function is put to a different use, and this solves the problem; (iv) it also leads to a permanent change in the customary way.

This is the standard analysis of evolutionary innovations in the functional-historical tradition, and it is exactly this formula - adopted from Klaus Holzkamp - that explicitly forms the theoretical structure of Raeithel's story.

The method is quite sensible, since processes of this kind surely took place in evolution and no doubt played an important role in the shaping of the human being. Since problem solving refers to the perceptions, feelings, and actions of a subject, it is also sensible in a literal way, and immediately gives meaning to the evolutionary process.

The Hidden Significance

But is problem solving all there is to evolutionary change? Can everything be explained from the perspective of the subject? Our former analogy said no. Evolutionary change cannot be reduced to the purview of the subject. The meaning of events assessed by the individual, and the deeper significance of events, need not coincide. While inventionism restricts itself to the former, the latter might dictate evolution. An illustration: Finding itself caught in a fast dwindling lake, a Devonian fish managed to shovel itself across a stretch of dry land into another lake (problem-solving inventionism). The vital need for successful repetition made natural selection search frantically for any genotypic variation (accidentalism) that could strengthen the land-propelling action (adaptationism). The evolutionary significance of these events was completely beyond the fish, yet the implicit logic of what, for the fish, was mere problem-solving, did lead to an entirely new form of life, the terrestrial vertebrate (rubiconism). I believe such logical shifts could and should be identified in the rise of all major taxonomic classes. They hold the key to mammals and to the human being.

The radically new can easily hide itself in the continuous old. To count as an explanation, however, the phylogenetic reconstruction needs to pick it out, to make the radical shift in logic explicit. I don't think that Raeithel's story does that. This imperfection would be inconsequential if it could not be shown to have consequences for his understanding. Let us therefore perform a pragmatic test.

Recalling the view of evolution as a series of adaptive plateaus, connected (or divided) by sudden shifts, I believe that the divide between animals and humans, insisted upon by Protagoras and Wallace, is exactly the shift between plateaus. According to the proposed view, Raeithel's explanations (inventionism and adaptionism) apply to the adaptive changes that take place within a plateau. The shift from one plateau should therefore be beyond the reach of his explanation. When dealing with properties of adaptation, his account should be very good, whereas it should fail when dealing with properties belonging to the shift. To make this distinction, some theoretical assumptions need to be made, however.

The Plateaus of Mead-Mind and Vygotsky-Mind

I believe there are three major stages in the evolution of mind and behavior. The first establishes the relation of intentionality in behavior and sensitivity. The following two produce new modes of recursive action and reflexivity by a decentering, externalizing, or mediation of the previous one. Stage two thus turns stage one inside out. A complex of emotions and "inner representation" evolves and becomes mediated as social communication; the individual reflects his own state through the reactions of others. This social externalizing of mind creates reflective social mediations, such as selves. The third stage represents a turning of stage 2, offering yet another level of decentering and reflexivity: consciousness and language. It is also social in origin, in fact, I believe that it originated through some strange, but radical shift in the logic of social practice.

The second stage is represented by the mammals. We could call it the *Mead-mind*, since the theory of George Herbert Mead nicely catches the basic principles of this theme as it develops from the "gestures of dogs" and onward. The third stage is unique for humankind. We could call it the *Vygotsky-mind*. Not because Vygotsky could explain it, but because he so masterfully emphasized the unique role of language in human intercourse.

The Mead-mind and the Vygotsky-mind belong, in my understanding, to the plateau of the ape and to the plateau of the human being, respectively. It is the shift between these plateaus, hence the radical difference between the Mead- and the Vygotsky-mind, that anthropogenetic reconstruction should explain.

These theoretical assumptions accord very well with the stages in Raeithel's story. In his first act, it is really the Mead-mind he brings to new heights through the notions of advanced imitation; while it is the invention of language, hence Vygotsky-mind, that is the crucial innovation of his second act.

Humans, of course, partake in the Mead-mind. Though an old mammalian theme, its functions can be put to new use through inventionism and adaptationism. Mead-mind advances with the human advance. Vygotsky-mind, on the contrary, originates with the human being. It therefore represents a new and unique form, and cannot easily be explained by adaptation or inventive problem-solving. Thus we have established advanced imitation as a property belonging to adaptation, and language as a property belonging to the shift. Our prediction now is that Raeithel's account of imitation will be very good, while his account of language will be clearly lacking. The first part has already been confirmed; let us therefore turn to his explanation of the origin of language.

Raeithel's Theory of Language

It says: Imitative communication was highly needed, but impossible during productive activities, "because you can either be productive, or stage a drama." Therefore, some old form of vocal expression "now became the medium through which the dramatizing of experience had to be done when the archaic, not yet fully speaking humans were too busy with productive work to stop and dance their fantasies or perceptions. The ritual form of the dramatic communication was now reproduced in the sequence of short sentences, and slowly a sort of grammar evolved."

We will judge it by the company it keeps, the immediate sensibility it offers, and the theoretical argument it invokes.

The explanation is in good company, being an amalgam of classical ideas. We find the idea that language has its roots in imitation and the idea that language has its roots in ritual communication (courtship, usually), both advocated by Darwin. Foremost, however, we recognize the variant of the gesture theory that was proposed by Sir Richard Paget in 1930. The gesture theory takes the view that articulated bodily expression and gestures preceded speech as the primordial language. Gesturing, however, has a serious drawback. You need to have your hands free, and this will prevent you from other manual tasks. Paget therefore suggested that the gestures of early man were mimicked by movements of the mouth, being transferred, so to speak, to another medium, making work and communication simultaneous possible. Raeithel tells exactly the same story of spoken language as a case of rerouted communication. This proposal makes us weary, since such a transfer is accompanied by no shift in logic. Even if the new medium opens up a new range of practical possibilities, the semantics and communicative function stay much the same.

How sensible is the explanation? Can we see it happen, as if we were there? Let us imagine we are in a hunting or a gathering party. No, it is really impossible to imagine concretely that humans, wanting to communicate, but with their hands full, suddenly begin (and there must be a first time) to imitate vocally. The idea breaks down when we try to visualize it.

The resources fail us, therefore we need to communicate dramatically. Why are we not able to do that? Because we have our hands full, Raeithel says. But the problem of feeling the urge to communicate was that we were outside the work situation, was it not? Even if this inconsistency can be circumvented, there are other problems. The vocal proto-language already in operation is supposed to have taken over the content of imitation in a time of crisis. If you visualize yourselves on the spot where it happened, it is very difficult to imagine. The proto-language had been in use all the time, so how would you detect the change in semantics? Would it have sounded differently? It is not difficult to imagine that the semantics of imitative drama could have fused with the semantics of the proto-language, if they were co-present in protohuman life, as Raeithel says they were. The verbal proto-language of the modern toddler is from the beginning fused with the social meaning of events, as Katherine Nelson shows. What is difficult to imagine is why the drama and the proto-language were not connected from the very beginning. What kept them apart until the crisis? If the proto-humans had a semantic mediation as extensive as the one depicted by Raeithel in the form of institutionalized drama, it is unimaginable that the vocal communicative systems should not have been incorporated. But that would mean that the origin of real language, defined by its semantic properties of going beyond the present situation, would have coincided with the origin of drama. It might even have been the cause of imitative drama, rather than the consequence. Or, both might have been the consequence of a hitherto unidentified cause, which then would aspire to the cause of human origin.

Does Raeithel produce theoretical arguments that enable us to navigate these possibilities? He offers us the methodology of the problem-solving scheme, and this forms the theoretical dictate of his reconstruction: Old functions should respond to new needs, thus giving rise to new functions, etc. The evolution of humankind, therefore, must be rendered as a protracted series of progressive functions, all seen as the solution to some problem. The chronological separation of communicative drama and language, as well as the sudden need to speak, is demanded by this method.

I don't think evolution can be subordinated to this method. I take the inadequacy of Raeithel's explanation of language as proof of that, and confirmation of our test. Problem-solving inventionism has its merits, but it cannot encompass the new and unexpected. Between us and the apes there is a Rubicon, a shift in the logic of living that turned the table of evolution. A change in the significance of the vital relations caused the shift from the simian to the human plateau. But Raeithel does not identify it.

The Problem is the Problem

This is no critical reflection on Raeithel or his story, the insights of which I have already praised. There is no good explanation of the origin of language, and I am certainly not prepared to give one here. Neither am I prepared to explain what the mysterious Rubicon could be in this case. My aim is less ambitious, though still important. Namely, to urge that

the notion of Rubicons is valid. They do exist. Further, that the recognition of this fact is of utmost methodological importance in phylogenetic reconstruction. A few words about that issue will conclude my commentary.

Raeithel states that he intends "to solve the problem of the phylogenetic origin of communication." It should be obvious that this presupposes an understanding of what the problem is. But we are not offered an analysis of this, as we are not in most theories. Phylogenetic theories jump to the solution, as if the solution is the key to the problem, rather than the other way around. But this is an illusion of retrospection. The notion of phylogenetic plateaus separated by divides, is a notion of bounded ways of living. Within the boundary all kinds of adjustments and innovations are possible, but the boundary cannot be transgressed, because a transgression would be a violation of the logic of a living theme. If this was not so, species could wander every which way; after all, needs and advantages are inexhaustible. But it is so; the boundary is inviolate. Yet, sometimes in evolution boundaries are transgressed, giving sudden rise to another bounded plateau with another living theme. In order to explain this, we must understand why it was impossible in the first place. Only when we understand its impossibility, do we understand the content of its possibility.

Notes

[1] I am referring to an anthropogenetic proposal of my own. See Engelsted, N. (1992). A Missing Link in AT?, *Multidisciplinary Newsletter of Activity Theory, 11-12,* 49-54.

[2] Darwin, C. (1968). *The Origin of Species,* (pp. 444-445). Great Britain: Penguin Books.

[3] In Plato's dialogue *Protagoras.*

[4] It was presented for the public in 1858 as the Darwin-Wallace theory of natural selection.

[5] Wallace, A. R.(1864). The Origin of Human Races and the Antiquity of Man deduced from the theory of "Natural Selection," *Anthropological Review,* Vol. II, p. clxiii.