

# Detachment, Genomics and the Nature of Being Human

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## Introduction an Overview

Human self-understanding and our presuppositions about nature are surely mutually implicative and inseparable, even if the reciprocal lines of influence can be complex and subtle. While we've come to fret quite a bit about the ethical poverty, and arguably catastrophic consequences, of our modern Western (but increasingly global) technologically-driven 'vision of nature', we may have lost sight of the extent to which our human self-understanding is an inextricable part of that 'loop'. While there are many who feel sickened (on behalf of nature?) by even the suggestion of a need for any further anthropological self-reflection (haven't we obsessed about ourselves enough?), it could well be that such sickness is itself a symptom of the same disease. Our understandings, tacit or otherwise, of nature and of ourselves, will influence and implicate each other whether we choose to become conscious of such influences or not, so surely better that we make this more explicit as opposed to less. If my intuitions (and the strategy of this paper) is correct then any 'high road' to a new and better (and in any sense more ethical) vision of nature can only be gotten through an interplay of 'nature' and 'human nature' concepts and considerations. Many contemporary 'naturalists' celebrate the idea that Darwin brought us closer to the animal world, i.e., to 'nature', but they ignore (at our peril) the concomitant dialectical implication, brought to our attention by Hans Jonas - that Darwin equally brought animal nature *closer to us*. But to reap *that* bounty of potential naturalistic insight we have to also be getting it right about us. Dialectics, of course, can well resemble the logic of a ping-pong match. Following an introductory (and hopefully contextualizing) excursus on Aristotle, the strategy of this paper will be to borrow a concept—that of 'detachment'—from the lexicon of 'philosophical anthropology,' put it to use as a basic organizing concept for rethinking the ostensible 'purposiveness of nature' in modern terms, re-situating ourselves, anthropologically, in

such a reconfigured nature and finally reflecting on that vision of a nature which has (once again) become ‘closer to us.’

### **Aristotle’s Nature and Immanent Teleology**

My story, if you will, begins with a reconsideration of Aristotle’s four causes. Aristotle was the founding father of biology, if anybody was, and arguably Aristotle’s point of entry into systematic philosophy was biological. Biologically speaking, Aristotle got something entirely right. Living beings exist as ends-unto-themselves—as self-sustaining entities that respond to challenges with spontaneous adaptive abilities. The very possibility of a science of physiology is predicated on the idea of an organism’s life as a telos (final cause) to which functions are only functions in relation to and for the sake-of. An organism constitutes a functional and developmental unity—indeed this is what we mean by the concept of an ‘organism’ - which was also why the atomistic reductionism (material and/or efficient cause) of the likes of a Democritus appeared to be inadequate and unconvincing for Aristotle. What is it in ‘atoms’ that would cause them to coalesce and perform as a higher unity? Likewise, in arguing against the formalistic reductionism (formal cause) of Empedocles, Aristotle appealed to the dynamism of final cause. All of the outward appearances, all of the right colors, shapes and textures of a synthetic arm, as Aristotle argued, is not tantamount to a living arm that dynamically incorporates nutrients, grows, heals, adjusts, and adapts. Indeed we now know that even the simplest living cell in culture can be trained to adjust to extremes of temperature, of ionic concentration of exposure to toxins, etc., to which it would have had no prior, or even let’s say, evolutionary, exposure. The scope of the potential adaptive capacities of even a single cell is for all intents and purposes beyond surveyability and indeed it is precisely this that accounts for why cancer continues to be a perennial, unpredictable, and often tragically intractable menace to our (metacellular) individual survival. In the 19<sup>th</sup> century Darwin had to wean himself from a teleology of perfectionism but this was not the naturalistic teleology of Aristotle but rather the teleology of a Christian creator, not the teleology of Aristotelian immanence but one of a manner of neo-Platonic, albeit Christian, transcendence. Nor is it any small irony that our most media-friendly, self-

stylized naturalists and religion bashers, Richard Dawkins and Daniel Dennett, have taken on board their putatively neo-Darwinian battleship, not the rich immanent teleology of Aristotle but rather the likeness of a transcendent designer-teleology, i.e., that of an ‘invisible hand’ of natural selection.

What Aristotle’s ‘nature’ gets right is that living beings are not merely well ‘designed’ for a habitat or a style of life but are actively and dynamically in the business of sustaining themselves in flexible and even unpredictable ways. For modern science, it is precisely this that renders the living organism anomalous, step-children of an otherwise inert nature, whose ostensible self-purposiveness needs to be explained or even better - explained away. Within a pre-modern metaphysical horizon, Aristotle could query the place of the living organism as an open question. In the logico-semantic analysis of his *Categories* he surmised that that which could entertain any number of predicates and even retain its identity despite giving rise over time to even contrary predicates (e.g., blush and pale, sick and healthy, etc.) was more substantial, and thus more exemplary of the nature of nature, than that which couldn’t. But can such substantial beings, such as Socrates or Bucephalus (Alexander’s horse), i.e, living beings, be derived from more elemental matter? Aristotle’s studied answer to this question of physical reductionism was negative. Might it be the case that the entire problem-space of what we call biology is structured by exactly this dilemma? To understand life is to recognize its ineluctable finality as Aristotle intended it and to recognize its thoroughgoing materiality—but how to relate the two? For Aristotle the best solution was to understand the primacy of ‘substantial forms’, that is, the fusion of formal and final cause, within nature as that which captures and shapes and animates materiality from within. Form and finality are inextricably linked in the living organism, and immanent in nature. The finality of substantial form is what accounts for flexibility in the face of contingent challenge. That substantive form is also constrained by material necessity attests to the sense in which it has little to do with transcendent perfection.

### **The Problem Space of Modern Biology**

Whatever one may or may not think about the contemporary relevance of Aristotle's philosophy/science of nature, it offers a concise and perhaps seminal point of departure for thinking about the large-scale problematics faced by post-Copernican Revolution science and how this may have structured our vision or visions of nature. Two points are most salient. First, by fusing 'formal' and 'final' cause Aristotle was able to detranscendentalize 'Form', bring it down to earth and enable it to be pliable in the service of natural concrete ends. Organisms don't do what they do for the sake of a Form. The ostensible normativity that is realized in the generation and regeneration of organismic form, the 'good' that is realized, is not abstracted away from the natural, living beings that are the realizations/instantiations of such form. For this very reason, the dynamics of form cannot be easily theorized. Aristotelean 'substantial' form cannot become 'disinterested' and abstractly lawful. The separation of final from formal cause, as we'll see, opened up new explanatory possibilities, but at a cost. Second, the inability of 'pure materiality' to account for the form and finality of the organism was not a problem for Aristotle's non-reductionistic conception of nature but has constituted a (and perhaps 'the') unfinished desideratum for modern science.

Key to that metaphysical shift which conditioned the new horizon of thought was the relocation of final cause from within nature to the mind of god. What this meant for biology was that the relationship of formal to final cause became contingent. Logics of biological form could thus be developed and elaborated on their own terms. Linnaean taxonomy for example completely brackets finality, and simply looks to make salient formal properties of organisms useful for the purpose of classification. Are one set of features more salient for purposes of classification or another set of features? By simply focusing on formal features of an organism a new theoretical possibility space emerged. From Linnaeus's extrapolation of aspects of organismic form for use in classification emerged the comparative study of organismic form as such, i.e., the science of comparative morphology (Amundson, 2005). But the adequacy of either classifying or morphologically analyzing an organism on the basis of a purely formal approach was not uncontested, far from it. Final cause *reemerged* in the name of function. If classification was a purely formal pursuit for Linnaeus this was an absurdity for his French adversary

Buffon for whom classification had to capture something of the functional or final essence of a life-form (Grene and Depew 2004). For Buffon, a species was not merely about formal resemblance but also must be about functional status as a generative unit – that which has the wherewithal to reproduce and thus sustain an organismic form. We continue to follow Buffon in favoring a conception of species predicated upon the capacity of members to interbreed. What I want to suggest is that all or most of the principle antinomies, conflicts and controversies that have coursed through modern biology up to the present—preformationism versus epigenesis, Geoffroy’s ‘unity of form’ versus Cuvier’s ‘conditions of existence’, mechanism versus vitalism, classical genetics versus embryology, genomics versus systems biology—are all about different ways of relating formal to final cause—all about the exploration of a conceptual state space that opened up when formal and final cause became pulled apart and their possible relationship made variable and contingent. But it has also been about our inability, thus far, to put the pieces back together, to have it both ways, to derive from the logics of formal and or material cause the property (or properties) of finality.

### **Nature Explores Greater Levels of Detachment**

If what we really want is a scientific understanding of nature in which we can ultimately locate ourselves as both immanent possibilities and contingent actualities (and just what would be the warrant for doing otherwise?) then our own experience of being *of the nature* we wish to understand surely must at least in principle be a germane source for naturalistic insight. Although Frans de Waal for one, speaking as perhaps our leading contemporary expert in primate ethology, has persuasively exposed the foolishness of blanket injunctions against drawing on human self-insight in the name of combating ‘anthropomorphism’, old injunctions still die hard. The real problem of ‘anthropomorphism’, in turns out, is that it’s usually not ‘anthro’ enough. Here is the dark side of that dialectical ping-pong game referred to earlier. When phenomenologically deficient, ‘intellectualist’ misconceptions about how we are as humans, are projected ‘down into’ nature (as ‘preformed-information’ for example) they come back to us in a ‘vision of nature’ that reinforces the misconception of human nature

that we started with. The problem is not that of drawing a concept from out of human experience, the problem is getting the concept right. The idea of ‘natural detachment’ arose first of all from Enlightenment thinkers who, for the first time, began to follow a naturalistic inclination to wonder about the relationship of the organic human body to human language, reason, morality and so forth. The insight was a good one but rather than leaving it at the level of human particularity, let’s take it to be an insight into nature in general that can be treated, not as all-or-nothing, but rather with nuance along a continuum and, as it were, *all the way down*.

Detachment, so conceived, is a measure of the relative independence of an entity from a larger milieu—its ability to resist the forces of thermal or other kinds of winds. Where all aspects of a field are in smooth and undifferentiated causal continuity we would say there is little or no detachment. Detachment arises, first of all, as little vortices in a homogeneous field. The more detachment in a field, the less smooth and silky, the more granular. The idea of detachment maps and scales closely to that of ‘internal degrees of freedom’. The internal degrees of freedom are the number of parameters that have to be accounted for in order to determine the state of a system. Consider the case of a single atom. If an atom is hit by a photon it may respond to this packet of energy by translating in space, rotating, or having an electron jump into a higher energy state. So far as we know, what in fact it will do is entirely stochastic and the prior history of the electron has no bearing on its future responses to such perturbations. If we go from a single atom to even just a bi-atomic molecule like O<sub>2</sub> another degree of freedom is added. Hit with a photon, the biatomic molecule can do all of the above plus it can vibrate along its molecular axis. A larger molecule, such as the four-carbon butane, can do all of the above and also mutate or isomerize to isobutane. Again, like an honest slot machine, the gambler's fallacy notwithstanding, its prior history of interactions should have no bearing on the likelihood of subsequent behavior. A greater level of detachment, indeed a significant transition in the ontogenesis of detachment is achieved when the history of the unit or entity in question does bias its response to subsequent perturbations. Even a protein is already an historical entity inasmuch as its conformational history is both a function of its past interactions and a major factor in how it will respond to future

perturbations, such as a collision with a photon or another protein. To have a history requires the ability of an entity to buffer itself against random perturbations, or perhaps even to set its own agenda as to how it will receive and respond to stimuli from without. With the transition from small molecules to that of macromolecules, such as proteins and nucleic acids, nature begins to explore just such new levels of detachment. A protein or RNA molecule adds conformational modes to its portfolio of degrees of freedom. As we've said its prior conformational history matters. But so too can its conformational flexibility allow it to absorb perturbing forces and sustain its conformational disposition. It is just this property that allows proteins and RNA to act as enzyme catalysts.

These capacities for detachment enjoyed by single macromolecules also provides the basis for further leaps in internal degrees of freedom through the transition to a kind of *sociality of detachment*. Detachment proceeds further when macromolecules affiliate and enter into a collective enterprise in which local attachments, i.e., between molecules, allow for a greater level of collective detachment. With organizational closure a grand-leap in buffering against the global winds is achieved. Organizational closure entails the emergence of a self-sustaining enterprise through circular causality and dynamic boundary formation. What we are attempting to depict at the level of a macro-molecular soup is the shearing off of little ensembles of higher-level detachment, little vortices, fledgling enterprises that through circular stabilization provide themselves some modicum of dispensation from the thermal and chemical winds of the global soup.

A vortex of relative detachment – a quasi-system that sustains its own organizational closure – performs as an end-unto-itself. It becomes a locus of proto-normativity. It performatively chooses coherence over incoherence, enacting a criterion, and in so doing, in distinguishing between what performatively emerges as itself, versus other, in sustaining its own embodiment, it embodies the first cognitive act.

With the somewhat hypothetical example of a proto-cell, that is a self-sustaining boundary maintaining affiliation of macromolecules, a basic pattern comes into view. Higher levels of detachment from the global milieu are obtained through increases in

complexity and flexibility within a local domain. Nature explores new possibilities for detachment wherever such can be found. New levels of detachment constitute hierarchical transitions that bootstrap on the prior level. Heterogeneous cells enter into de novo symbioses. Single celled bacteria enter into consortia such as those that form bacterial films. Single-celled eukaryotes transition into colonies and then into integrated multi-cellular organisms. Sociality and ‘eusociality’ emerge as transitions into coherent groups of organisms (or even ‘superorganisms’) (Wilson & Hölldobler 2005, Wilson & Wilson 2007). In all such transitions the properties we’ve already discussed – greater internal degrees of freedom, the ability of a system to better buffer itself in relation to possible perturbations, to have a history which is a factor in its subsequent trajectory, and indeed to dispose itself in some way toward its ‘world’ and its future possibilities, are all accentuated at a higher hierarchical level.

If we can at least provisionally entertain the image of greater macro-detachment being achieved hierarchically by subunits of some kind that have entered into a cooperative affiliation – whether it be bacteria in a microbial film or differentiated cell lineages in a multi-cellular organism, and we will also want to say humans in a normatively structured socio-cultural life-world, we can ask the question as to what has to be the case for such higher levels unities to exist. While I won’t rule out in advance the possibility of any number of fanciful hypothetical alternatives, I would suggest that the more complex and highly integrated, and thus highly detached the higher level entity is, the more *permeable* the components must be to each other such as to be able to become integrated contingently and developmentally.

Is it really possible for the concept of detachment to have scope and relevance all the way from the sub-atomic through human experience (and for it to even mean the same thing throughout)? To say that humans are the most detached entities in nature is to suggest that humans are less at the beck and call of any particular natural stimulus or frequency. Enlightenment thinkers such as Hume and Herder, and many since, had already observed that the human body is *underprovided* for when it comes to natural strengths or attunements to nature as compared with that of many other species. That the

underspecialization of the human body, beginning with the anomalous immaturity of the human neonate, may bear a direct relationship to the human capacity for language, reason and sociality marked the origins of those kinds of synthetic reflections aptly described as ‘philosophical anthropology’. The basic intuition is not hard to fathom and it’s essentially about human attention. If human senses and organs were instinctually fixed upon and responsive to aspects of the surround it would be a mark of attachment not detachment. The lack of such fine attunement through specialization and fixed attention allows human attention to be made available for other things, it allows human attention to be turned toward the comparative inwardness of normatively mediated socio-cultural practices including language and the acquisition of skills. Now again we can ask what has to be true about the human organism for humans to be as they are and this brings us to a fortuitous confrontation. Evolutionary psychologists (Tooby and Cosmides 1992, Pinker 1994) have taken their own stand on this issue and have done so in way that is diametrically opposed to that which follows from the principle of detachment. I see this as fortuitous because both views can’t be correct and it provides an opportunity to sharpen the issues at stake. For evolutionary psychologists the answer is to be found in the domain-specific functional modules that fix the capacity for certain skills and the putative genes that code for the pre-scripted developmental production of such cognitive modules. The evolutionary psychologists thus advocate a model not of detachment and flexibility but rather of attachment—of fixed programs and hardwires. The view from detachment by contrast predicts more internal complexity more, not less, developmental degrees of freedom, and rather than domain specific modules an enhanced, multi-modal, domain general executive-level capacity, as described by the cognitive psychologist Merlin Donald (2001), necessary for an organism to *lead* her own process of self-formation through socially structured participation in processes of shared attention. More simply and generally put we may ask: is the human organism characterized by the addition of some new positive adaptations, added to the putative hard-wires of ape brains and ape genes, or is the human organism characterized by an increasing flexibility, and indeterminacy of internal resources that are less fixed and more susceptible of social-developmental interpenetration? Are humans more detached? Is the concept of detachment one which we can ground empirically and having done so elicit its services

in allowing us to sort through and make further sense of the empirical ‘manifold’ presented by the contemporary human and life sciences?

### **Comparative Genomics and Detachment**

How can we adjudicate these differences? Surely a worthy place to look would be to the evidence derived from comparative genomics. Much has been publicized about the promises of genomics—much less has been publicized about the actual findings. Might this be because the findings have not fit easily into the gene-pundit’s idiom? Two of the quantitative relationships that the human genome might have displayed in relation to other genomes that would have been in accord with traditional expectations failed to materialize. The human genome has neither more overall DNA than other organisms nor does it have a greater number of genes than other mammals nor even a significantly greater number of genes overall than some very simple invertebrates. This is to say that neither the gross amount of DNA nor the number of specific genes appears to *scale* with the complexity of organisms. Well if neither of these do than what does? Surely there must be something about the human genome that has something to do with the characteristics of humans. The lack of interesting correlations with the amount of overall DNA was called the ‘C-Value paradox’ (Cavalier-Smith 1985) and the lack of interesting correlation with the number of genes was called the ‘N-Value paradox’ (Claverie 2001). But it turns out that if we divide the number of genes by the overall amount of DNA in order to calculate gene density then we do finally see a relationship that appears to scale with complexity—but it is an inverse relationship (Patthy 2003). Genes are packed in bacterial genomes 100 fold more densely than are that of humans. Invertebrates genomes are packed 10 fold more densely than that of humans and ten fold less densely than bacteria. As we now know, the genes of multicellular organisms are not contiguous but rather are broken up into discontinuous chunks known as exons that are separated by intervening sequences known as introns. A single gene will be composed of tens or even hundreds of exons. Humans genome are again distinguished by the quantity and long length of their intervening sequences (introns). The genes of the human genome are thus literally, and exceptionally, detached. What significance might this have? The most

straight-forward inference could be that the detachment of coding regions allows for more flexible and more complex deployment of these resources. Where humans are distinguished with respect to specific gene content it is seldom about unique single copy genes, as these tend to be highly conserved going back to the one-celled stage, but rather it is about the expansion of families of closely related genes that appear to be generated by segmental duplication and the shuffling of exon units. Many of the genes that are involved in forming receptors at the surface of a cell are variants on a theme, evidently derived from exon shuffling and known as member of the so-called immunoglobulin superfamily. Where an invertebrate may have 50 or 150 of these genes, humans have close to 1000—quite a lot when you consider that the whole human genome has only about 23,000 genes. Differences in the expansion of gene families is also that which in terms of the comparative genomics, distinguishes humans from other mammals such as mice (Barclay 2003). But what significance might this have for the nature of an organism? Let's consider the following model of two ideal cell types. Cell A is more primitive and has a much similar repertoire of cell surface receptors coded for by its immunoglobulin gene superfamily. Cell B is of human, or perhaps higher primate origins, with a significantly more expanded repertoire of immunoglobulin superfamily cell-surface receptors. Cell A, we can thus imagine, has but a single cell surface receptor with a wide binding specificity. It is receptive to red, blue and green features of its world, but all in the same way, and in response sends a uniform white signal back to the interior of its cell. Cell B on the other hand, with its expanded repertoire of cell surface receptors can express six different receptors for the sensing and responding to the same aspects of the world. The first three of these receptors are each specific for red, blue, and green features of the world respectively in response to which they transmit red, blue or green signals into the interior of cell B, respectively. In addition it has three more receptor variants all of which bind and recognize equally all three features of the world, the red, blue and green, but each of these receptors transmits only one signal, either red, blue or green respectively into the interior of the cell regardless of which feature, red, blue or green, of the world was observed. Now taken as a whole Cell B has gained an enormous amount of detachment from the world relative to Cell A. Where cell A is bound to respond to red, blue or green features of the world in a predictable white way, Cell B can

either act so as to discriminate between the red, blue and green features of the world, or it may act so as to prefigure based upon its own history, how it will be poised to respond to any of these three features of the world, it can, as it were, choose to respond in a red way, or in a blue way, or in a green way, to whichever of the features it encounters in its world (Moss 2006).

This model of the two cells is meant to represent the trend toward higher levels of detachment generally. The claim would be that the lack of a fixed way of receiving and responding to signals and entering into relationships with other cells corresponds, on the one hand, with the loss of fixed specializations but also, on the other hand, with the opening up of vastly wider possibilities spaces for context sensitivity, for higher level buffering capacity, and for the possibility of a vastly expanded array of developmentally contingent specializations. Hierarchically, higher levels of detachment such as human cultures are, it would seem, predicated not on the addition of new fixed capacities so much as on the increasingly plastic and flexible, and thereby more intensive, use of the same basic resources that were already present in less detached organisms. But simply expanding the internal degrees of freedom is not a solution in itself, indeed it is the source of a potential problem and crisis. If everything is always up for grabs where does order come from? Excessive openness is a vulnerability, indeed a danger to life. The German philosophical anthropologists even referred to this as a sickness of mankind they referred to as *Mangelwesen*. I will suggest that much of what the theory of detachment has to offer philosophy comes by way of what I call the ‘pain of detachment’ and its dire need for compensation.

### **Detachment, Materiality and Final Cause.**

What is matter and what is its relationship to final cause? Matter is congealed energy. When energy congeals into matter it has rest mass. As an entity with rest mass, matter already constitutes a well of detachment in space. Nature explores greater levels of detachment—and it does so as matter. Is matter anything other than the realization of different levels of detachment, of the unlimited potential for exploring ever new levels

and manifestations of detachment? We formalize matter in the state of detachment that we find it, we abstract properties, generalize and make inferences but I think it's a mistake to think that we could ever exhaustively anticipate, through formalization, all of the potential possibilities of nature to materially explore new levels of detachment. So conceived, Nature becomes an open space in which the complexities of culture are no longer anomalous but rather are exemplary. New higher order regimes of detachment bring with them new regularities, new economies and ecologies and thus new higher order laws.

And what of final cause? Detachment comes at a price and generally the deeper the well of detachment the higher the price. Might it be the case that final cause is just another angle on what becomes an immanent drive toward sustaining some level of detachment? From within a regime, it's regularities take on the character of norms, which are enacted, felt and sometimes further mobilized in reflective symbolic self-presentation. Might it be the case that life is itself a fuzzy concept that we intuitively associate with certain regions on the continuum of detachment—say above a certain threshold? Perhaps all manifestations of detachment – all manifestation of matter—are as ends in themselves that burst into being. Where, as we said before, higher levels of detachment exist as regimes of self-enclosure that constitute local histories, the regime constitutes itself as its own final cause.

Bigger molecules have more degrees of freedom than smaller molecules but require the expenditure of energy to produce, and nature pays that price. Regimes of organizational closure require an on-going source of energy and thus metabolism is born. Metabolism is metabolism for something—there is no free-standing metabolism. That which metabolism is for is an end-unto-itself. Functions in general are that which serve to sustain levels of detachment. As there is always a price to pay, detachment does not, and cannot, exist in vacuo. Detachment must be compensated. Is final cause anything other than this drive for compensation? The more detached an entity is the greater its need for compensation. As internal degrees of freedom expand the explosion of possibilities can be paralyzing. The more detached from the world an entity is the more desperate it is for

an anchor with which to settle and stabilize itself into an orderly regime. I call the perennial crisis that comes with higher levels of attachment the pain of detachment and I don't mean this in merely metaphorical terms. With the progressive achievement of freedom from the tyranny of unmitigated continuity with 'the all' comes an increasing desperation for some kind of compensatory engagement with a larger reality.

### **Sociality, Culture and Compensation**

If there is one thing that all (empirical) anthropologists appear to agree on it is that the biggest challenge to a theory of human evolution (or anthropogenesis) is that of accounting for the expanding capacity for sociality bonding. Hominid survival on the savannah required a far greater capacity for sociality than had existed amongst primates in their arboreal habitat but explaining where it came from has been a problem. The theory of detachment may help to provide an answer. The idea that more detached cognitive capacities evolved in hominids is hardly new but it is *as* the dialectical correlate of detachment manifested in the increasing *pain of detachment* that may offer the missing piece of the puzzle, the enabling insight for doing the explanatory work. Robin Dunbar's studies on brain size resulted in the then surprising result that the only trait that consistently correlates with brain size is the size of a social group, resulting in the now-widespread 'social brain' hypothesis (Dunbar 2003). But what is it about larger brains that provides for expanded sociality? The biggest transition in anthropogenesis took place, not between *Homo sapiens* and their immediate predecessors but rather between the small-brained Australopithecines species and *Homo erectus* whose brain reached over 80% of the size of that of modern humans (Donald 1993). And it was *Homo erectus* that attained that level of detachment requisite to becoming the first hominid species to leave Africa and become geographically and ecologically cosmopolitan. Durkheimian sociology has long since provided an account of human solidarity built as shared emotions, collective effervescences, become stamped into the shared meanings, norms and feelings that constitute the glue of collective identity. There is no mistaking the power and force of cohesion that people feel when dancing to their music, or cheering for the same team, or simply sharing the same somatic style. Why should we feel solidarity

with others who dance to the same beat, whose bodies move in similar ways, and who feel the same norms we feel and conduct themselves accordingly? The unacknowledged elephant in the room is the very motive force that drives all of this—the depth of our need for compensation, our desperation for grounding, for immersion into a normative world that enables us to quell the crisis of our excessive and indeed life-threatening indeterminacy. The cognitive scientist Merlin Donald (1993) posed the enigma of *Homo erectus* and offered a brilliant solution. The enigma is that *Homo erectus*, during a reign of over a million years, managed to leave Africa and inhabit regions throughout the contiguous Eurasian land masses, domestic fire, establish permanent encampments, produce a hand axe tool that required skill and pedagogy and organize sophisticated hunts of giant mammoths and such, that would have required social coordination and some differentiation of labor and accomplished all this without, as best we can tell, any spoken language. The explanatory challenge that Donald took upon himself was not just that of accounting for what the cognitive basis of these accomplishments could have been but also that of accounting for what could possibly have become the pre-conditions for the eventual evolution of spoken language. From what kind of socio-cultural state of affairs could arbitrary signifiers, sounds in particular, come to have gained the power of reference? His solution was to propose the idea of a mimetic culture and manner of cognition. The cognitive breakthrough was prefigured by the capacity for highly coordinated motor skills that would have been a legacy of the arboreal past. Other primates such as great apes display impressive degrees of social knowledge and even savvy but their knowledge is confined to within an active ‘episode’. Donald’s mimetic breakthrough begins when a hominid can voluntarily *detach* a segment of somatically enacted social drama, rehearse it, possibly refine it, and redeploy it with communicative intent. The ability to ‘autocue’ series of motor sequences that already had a meaning in the social episode, and which could now be mobilized for use in communicative acts, would have provided the wherewithal for a culture of mimetic communication expanded and solidified through the invention and elaboration of ritual. Donald’s theory of mimesis provides the cognitive tools, but the motive force of social cohesion was the heightened and increasing dire need of compensation for the pain of detachment. Ultimately language evolved, Donald claims, within and upon the socio-cognitive space of the

mimetic world, but not, as many have assumed, for its instrumental utility, but rather for its ability to provide for myth. It was language as myth that transformed hominid existence and ushered in the age of the modern Homo sapien. And what is the good of myth if not that of a more powerfully articulate and flexible form of compensation by way of a now symbolically mediated, normatively structured world?

The word ‘detachment’ may tempt traditional ‘modernist’ notions of humans as a species apart, humans as detached from nature, but that wouldn’t be quite right. Resituated and contextualized in a philosophy of nature, in nature as understood as an on-going exploration of greater levels of attachment, humans are no longer to be understood as detached *from* nature but rather detached *by* nature. Nature explores higher levels of detachment and human socio-cultural life-forms are the most detached formations of nature yet (at least that we are aware of).

### **From Philosophical Anthropology to a New Vision of Nature**

Human beings seek and secure compensation for their primordial pain of detachment on many levels, indeed all human activity can be said to entail and be shaped at least in part by its compensatory function. In developing a skill the human body gains an attunement with the world and a form of specialization that compensates, by constraint, for its overwhelming openness to all such skillful possibilities. Parallel things can be said about the acquisition of a ‘somatic style’ by which I mean the full complement of expressive and embodied habits, inclinations, tastes, styles of adornment, postures, manners of movement both mundane and ceremonial that characterize an ‘ethnos’. The early Marx understood even labor also in anthropological terms, as the expressivist centerpiece of our species-being. For the early Marx the ‘alienation’ of labor was not only a matter of economic exploitation but much more saliently a calamitous frustration of the human essence, of the human telos, which for Marx was the autonomous (expressivist) self-production and self-transformation of human nature through self-governing productive activity, i.e. *through human praxis*. Where a renewed expressivist anthropology, checked and informed by way of an on-going interactive conversation with the empirical human

and biological sciences can refresh and renew an even richer understanding of praxis as the socially self-conscious species-constitutive self-production of the human socio-cultural 'life-world', it need not, and should not, do so over and above 'nature' understood as object or some sort of raw material for only our own purposes. Guided by a philosophy of natural detachment, nature brought 'closer to us' is nature filled with detached others who likewise suffer and seek compensation at their own measure, with whom we affiliate as co-symbionts, ecological cohorts, companion species and domestic partners within normative regimes that are enacted as well as, and often perhaps better than, they have come to be narratively and reflectively construed. Guided by an anthropology of detachment, an empirically accountable re-enchantment of nature reemerges as the dialectical implication of rediscovering ourselves as always already embedded in such multilayered, normatively co-constituted, species-cosmopolitan regimes of compensation.

#### References

Amundson, R. (2005) *The Changing Role of the Embryo in Evolutionary Thought* (Cambridge: Cambridge University Press).

Barclay, A. (2003) 'Membrane Proteins with Immunoglobulin-like Domains—a Master Superfamily of Interaction Molecules' *Seminars in Immunology* 15: 215-223.

Cavalier-Smith, T. (1985) *The Evolution of Genome Size*. (New York: Wiley)

Claverie, J. (2001) 'Gene Number: What if There are Only 30,000 Human Genes?' *Science* 291: 1255-1257.

Donald, M. (1993) *Origins of the Modern Mind: Three Stages of Culture and Cognition*, (Cambridge, MA:Harvard University Press).

Donald, M. (2001) *A Mind So Rare* (New York: W.W. Norton)

Dunbar (2003). The social brain: mind, language and society in evolutionary perspective. *Ann. Rev. Anthropol.* 32: 163-181.

Grene, M & Depew, D. (2004) *The Philosophy of Biology: An Episodic History* (Cambridge: Cambridge University Press).

Moss, L. (2006) 'Redundancy, Plasticity, and Detachment: The Implications of Comparative Genomics for Evolutionary Thinking' *Philosophy of Science* 73: 930-946.

Patthy, L. (2003) 'Molecular Assembly of Genes and the Evolution of New Functions' *Genetica* 118: 217-231.

Pinker, S. 1994. *The Language Instinct*. (NY: Morrow)

Tooby, L & Cosmides, J. (1992) 'The psychological foundations of culture' in *The Adapted Mind: Evolutionary psychology and the generation of culture* (ed. J. Barkow, L. Cosmides, & J. Tooby), 137-159.

Wilson, D.S. & Wilson, E. O. (2007) 'Rethinking the Theoretical Foundations of Sociobiology', *Quarterly Review of Biology* 82:327-348.

Wilson, E. O. & Hölldobler, B. (2005) Eusociality: origin and consequences. *Proceedings of the National Academy of Sciences of the United States of America* 102:13367-13371.

