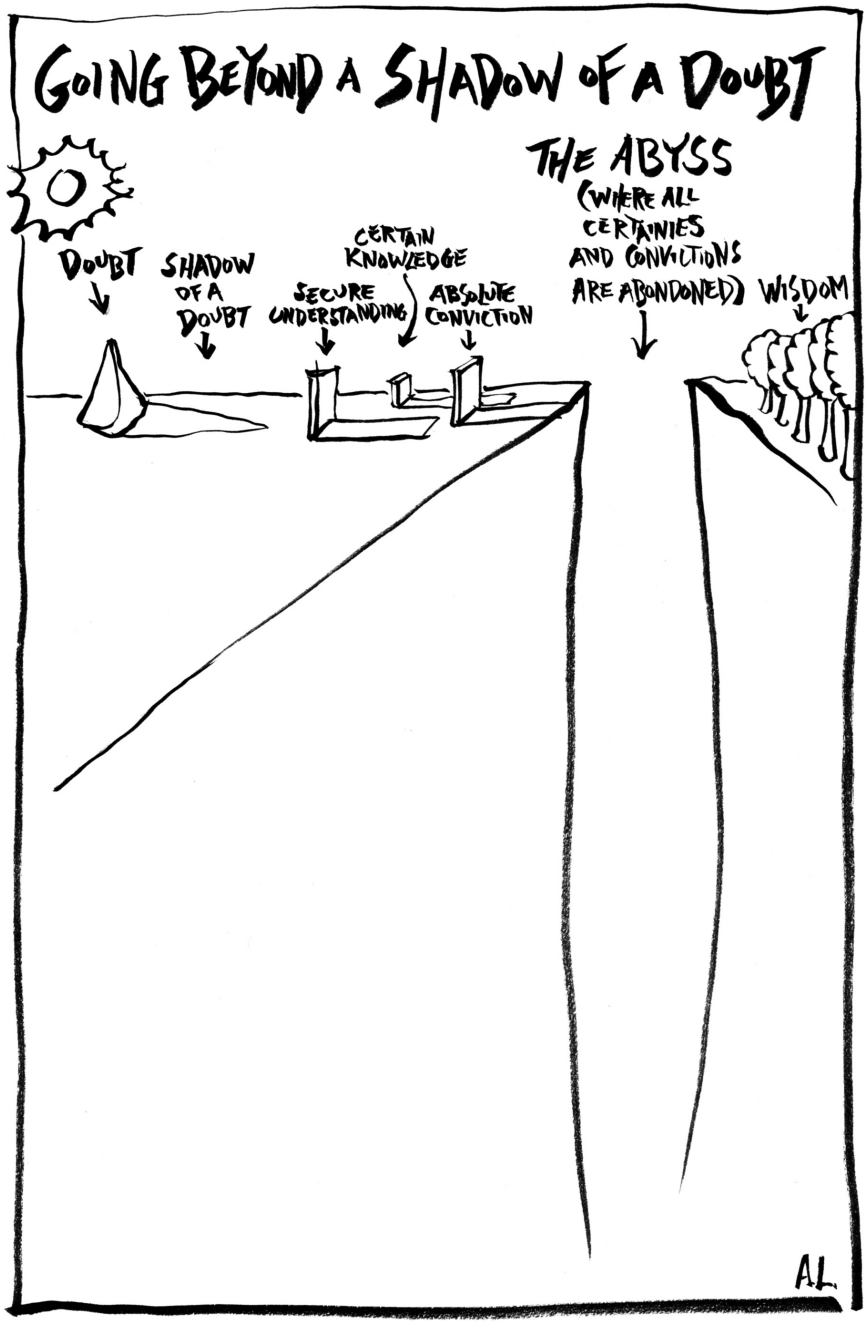
EVOLUTION, AUTISM *and* SOCIAL CHANGE

A New Feminine Theory of Evolution
That Explains Autism

Andrew Lehman



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Evolution, Autism, and Social Change

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For Marcia

...you made this project possible...

Contents

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Novelist Tom Robbins wrote me four years ago, responding to a nine page piece. I was stunned by what he wrote. He told me it was the most interesting and compelling thing that he had read in several years.

I realized that if my favorite author liked what I wrote, then maybe I could risk telling myself I can be a writer.

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Thank you, all.

Andrew Lehman
April 1st, 2010

An Introduction

When natural selection established itself as the most efficient and powerful way to explain evolution, several other theory pathways closed up shop, not because they were proven wrong, but because they seemed less useful and were inelegant in their explanations. Recent discoveries in neuropsychology, evolutionary biology, endocrinology and other sciences more than just suggest how useful those closed-up shops might be. There may be cities hidden in how those shops conduct their business. A deep elegance has emerged that one hundred years ago was not clear.

I am an amateur evolutionary theorist. I have walked an unconventional path to arrive at this avocation. My professional training was in fine art. I own and run a web development firm that has over 400 clients. I founded and co-direct a nonprofit organization, PJEP, which politically empowers 1,500 small, local peace, justice and environment organizations in 50 states. PJEP provides them with free online organizing and communications tools and sometimes guides them to participate in nationwide protests and projects. Fascinated by structure and interconnection, drawn toward several disciplines that connect to how humans evolve, I've ended up developing a theory of biological evolution that is complementary to, but wholly different from, Darwin's (1859) theory of natural selection. Though this theory has its roots with the work of Darwin and his contemporaries, integration was not possible until recently.

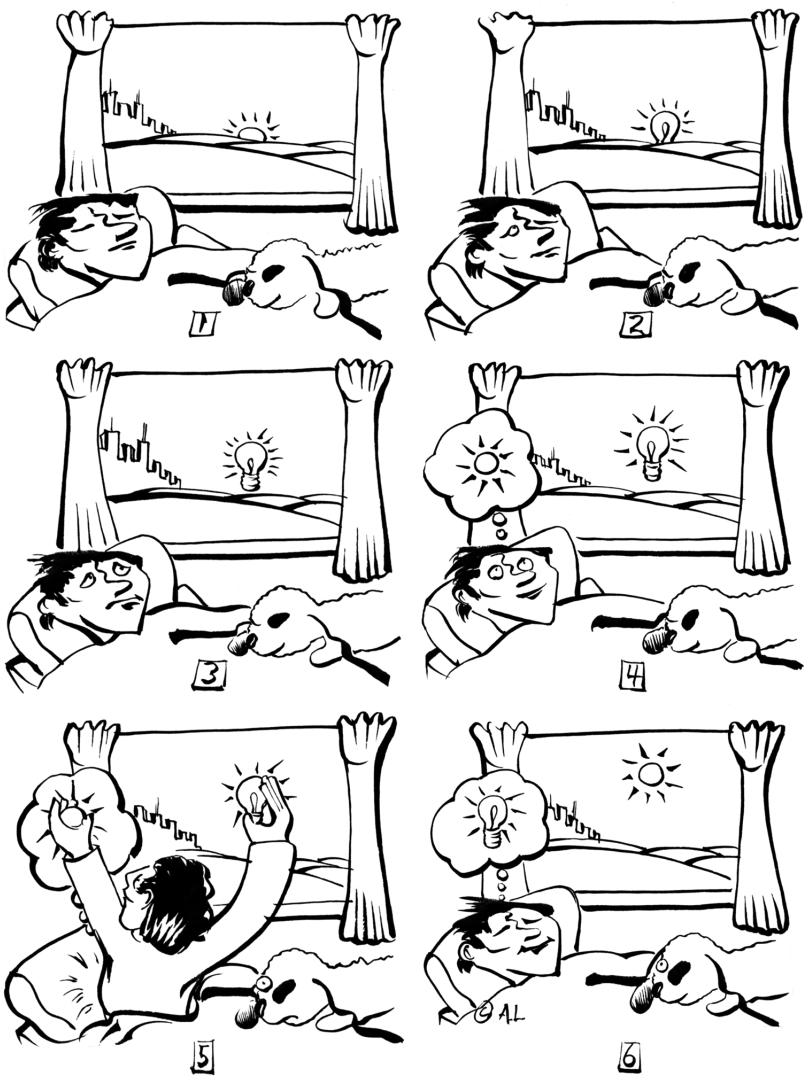
In just the way that Mendel, Watson and Crick revealed principles that firmly established the theory of natural selection (Watson & Crick, 1953; Jablonka & Lamb, 2005), neuropsychologists Norman Geschwind (e.g., Geschwind & Galaburda, 1987), Marion Annett (e.g., 1985), Simon Baron-Cohen (e.g., 1995) and anthropologist/primatologist Sarah Blaffer Hrdy (2009) have uncovered patterns that suggest that how an individual matures is central to how species evolve. Darwin's (1859) theory of natural selection described how death and the dynamics of conception can explain evolution (individuals surviving to procreate produce progeny that inherit those specific features via variables randomly assigned). The Orchestral Theory of Evolution described in this work focuses on maturation (life between conception and procreation) and how both the environment and social structure impact individuals to produce progeny influenced by events in their parents' lives.

By fleshing out a complementary, hidden partner to the theory of natural selection, this Orchestral Theory of Evolution offers an etiology of autism and other conditions informed by a maturation paradigm. There is a strong feminine component to this theory. This is a theory based upon a presupposition of interconnection, not the random relations proposed by the theory of natural selection. Not unlike a physicist who has the ability to understand light as both particle and wave, I propose that Darwin's theory of natural selection and this Orchestral Theory of Evolution are both true. A larger whole informs constituent parts while at the same time chance is engaged.

As an amateur theorist with an artist's training, it is important that my work be evaluated both as a product of science, and appreciated or approached as a work of art and play. Each idea posited requires strict evaluation by academic standards. At the same time, approach this work as a thing produced by inspiration. An individual becomes a scientist by committing time and intelligence to a discipline to such a deep degree that the individual has something significant to lose if he or she doesn't behave in an exemplary fashion. I have walked a completely different path. I lose nothing if the connections made in this work are not recognized as significant or useful. Yet, as an artist revering science, I have felt compelled to be part of the process that created these words.

As an artist, I experience what follows as beautiful. It is my hope that these words will also be of use.

December 29, 2009



I Getting Started

1
Tuning Up

> It is, in fact, most remarkable how many primitive hunting races have the legend of a still more primitive age than their own, in which the women were the sole possessors of the magical art. (Campbell, 1959, p. 315)

It seems too elegant to be true, but I've become enamored of the possibility.

Heterochronic theory (see Gould, 1977), the study of the effects of rate and timing on maturation and development, takes the work of several late nineteenth-century and early twentieth-century theorists and packages that work into a sort of seamless whole. Stephen J. Gould in his *Ontogeny and Phylogeny* (1977) went far, codifying the various theorists' predilections so that they made an overriding sense. I say "sort of" seamless whole because the actual endocrinological underpinnings of the dynamics were never explored.

Neoteny is the best known of the six heterochronic processes (McKinney & McNamara, 1990). Neoteny is the process whereby features of infants, embryos or the very young are, over the course of generations, prolonged to emerge in the adults of descendants (Cope, 1887; Gould, 1977). Acceleration is the opposite, whereby features of adult ancestors appear in the infants of descendants (Cope, 1887; Gould, 1977). For example, let's say great great grandfather had a baritone voice, emerging at puberty. His son's deeper voice may emerge just before puberty and his great grandson might have an unusually hoarse voice as a child. That would be an acceleration of a feature. These things normally take hundreds and thousands of generations, though they can be encouraged to occur in less than half a dozen. Foxes have been neotenized in a mere 20 years, acquiring dog-like characteristics (Trut, 1999).

Endocrinology is a new science even though we have been observing the effects of the gonadal hormones since the dawn of self-awareness. That there might be an elegant correlation between specific hormones and the rate and timing of maturation has not been explored outside of work done by biologists, followers of Matsuda (Pearson, 2004) mostly, on amphibians and other nonmammal species. For over ten years, I've been exploring the repercussions of a theory of human evolution that considers that testosterone regulates the speed of maturation. This is a profoundly epigenetic theory, a theory that estimates that testosterone regulation occurs as a direct result of environmental factors that determine testosterone levels. Epigenetic theories are those theories that explore heredity/environment interactions that result in ontogenetic and eventually evolutionary change. It was unorthodox until recently to consider that genes adjust to take into consideration environmental effects, or that genes may only be marginally involved in aspects of phenotypic evolution, and that the result of modifications will not only appear in the individual but in the individual's descendants. So, we might see why it's taken us a while to get to a place where testosterone could be even considered as a major force in evolution.

Chris Knight in his *Blood Relations* (1991) outlines the profound effect that social frames of reference have upon our ability to theorize. Thomas Kuhn (1962) alludes to the impact that shared social views have upon theorists' frame of reference. Knight (1991) describes how hobbled we are in the West by a nonfeminist perspective. Kuhn (1962) suggests a sea change of societal perspectives would be necessary for the following to make sense.

Heterochronic theory's (Gould, 1977) changing of rate and timing can be elegantly assigned to the effects of testosterone changing rate and estrogen controlling timing. Testosterone and estrogen are associated with a host of related hormones, and there are circumstances where male and female hormones may transition to the other (Baron-Cohen, Lutchmaya & Knickmeyer, 2004), but, speaking generally, there are patterns that suggest that at a very real level individual ontogeny, social evolution and human biological evolution are unfolding according to this very specific, two-variable dance.

Our commitment to Darwin's (1859) theory of natural selection has made it difficult to note the effects of the environment upon evolution.

Our devotion to the idea that the behaviors of males in evolution are more important than the behaviors of females has made it almost impossible to observe that behind the scenes it has been the female controlling the timing of the process.

I wish we had a better word than "heterochronic" to describe the patterns. It would be better if we had a name like "orchestral evolution." Then it would make more sense when we assigned the position of conductor to a woman. It is she that decides the timing of the production.

So, let's explore some features of orchestral evolution. This would be heterochronic evolution with some additions.

There are several places where I hypothesize estrogen may be quietly stepping in and deciding exactly how things unfold by regulating the timing of those events. That may be occurring in no small way due to estrogen controlling the timing of testosterone's effects.

Fat levels at puberty, which influence estrogen levels (Ahluwalia Jackson, Jones, Williams, Rao & Rajguru, 1981), determine the timing of pubertal testosterone surges in both sexes. Individuals may experience delayed puberty if there is not enough fat on the body to propel the process.

Estrogen levels in an infant and toddler may be influencing testosterone surges that determine cerebral synapse pruning. We don't know what determines the timing of testosterone surges that result in the diminution of the right cerebral hemisphere. If it is a similar process to what determines the timing of testosterone surges in puberty, then estrogen levels may not only be controlling cerebral lateralization but may be heavily influencing language production, conditions such as autism (Baker, Messinger, Lyons & Grantz, 2010) and numerous other human features and conditions.

Estrogen levels in a mother's womb may be deciding (along with testosterone) which social structure the child will be inclined to ally with. I posit that there are four social structures, two matrifocal and two patrifocal. Estrogen levels are a key determinant of social structure proclivity. I hypothesize that social structure has profound effects upon human biological and social evolution.

Estrogen levels may be determining both the intensity of mate selection criteria (higher levels compelling a more determined choice) and the degree of focus on the young. Estrogen not only decides which male features get passed to the next generation but determines the likelihood of progeny survival by influencing how much attention is directed toward the young. Consider that in female infanticide it is almost always the mother that kills the infant (Mungello, 2008).

Darwin's (1871) theory of sexual selection, or female choice, may be but the suggestion of a vast network of relationships determined by estrogen levels. Darwin was familiar with the work of contemporaries, Neo-Lamarckians, who focused on the orthogenetic tendency of features to evolve in particular trajectories (for a description of Neo-Lamarckism, see Jablonka & Lamb, 2005; and Gould, 2002). We can see those patterns now as part of the larger pattern of Gould's (1977; 2002) heterochronic theory paradigm, retitled "The Orchestral Theory" when integrating social structure impacts. It is possible that Darwin's (1859) theory of natural selection (1859) and his theory of sexual selection (1871) can be allied in an orchestral theory of evolution that places testosterone as the prime mover of rates of maturation and estrogen as the queen of timing. Interestingly enough, Darwin's (1868) third theory, pangenesis, revealed orthogenetic insights. Darwin (1868) even hypothesized "gemmules," or particles, which would flow through the bloodstream, carrying information regarding the environment to the places in one's body that controlled evolutionary change.

In other words, Darwin had all the puzzle pieces. But, he was exploring these ideas in a time when society embraced only the idea that might is right, environment be damned and women control little of what occurs.

What it boils down to is this: "*The Orchestral Theory of Evolution" is the study of the rates and timing of maturation, with testosterone levels impacting rate and estrogen levels controlling timing, with those environmental or social structure adjustments that influence levels of testosterone and estrogen determining the speed, timing, features and direction of evolution.*

To seriously consider that testosterone may control the rate of evolution, estrogen the timing, we might have to go back 150 years. The answer to our origins may be in the origins of evolutionary theory.

2

Overture

> No one, least of all Williams and Kafatos, expect the eventual story to be so simple. But it does seem likely that normal development is controlled by gradually decreasing concentration of a hormone acting primarily at high levels of the regulatory system. This is also an ideal mechanism for the simple and rapid production of heterochronic effects. Any acceleration of adult characters by reduction in the titer of juvenile hormone, or extension of juvenile traits by maintenance of a high titer, represents heterochrony. Since minor alterations in the concentration of a hormone can lead to substantial changes in morphology, heterochrony may play an important role in geographic variation (secretion of juvenile hormone is influenced by temperature and photoperiod, for example), polymorphism (including sex, caste, and phase) and speciation itself. (Gould, 1977, pp. 295-6)

This work represents a feminine theory of evolution insofar as what is not dominated by male frames of reference is often looked at as feminine or feminist by comparison. I would suggest this theory of evolution offers a balanced male/female perspective, even though the female often feels to be in control.

This work focuses on autism as a social condition featuring anomalous consciousness. I describe how specifically autism emerges and ways to cushion the confounding effects, and I describe how by understanding autism we understand ourselves. In addition, I propose that by understanding the processes that lead to autism, we understand the etiologies of a number of related and seemingly unrelated diseases and conditions. Trends in contemporary Western society will be explored in the context of social change that is informed by social structure and that is driven by the dynamics described by this theory, change compel-

ling the reemergence of a progenitor prototype, the autistic.

Several additional themes run through this work. Several related melodies play off one another as I explore how they are connected and the way that the melodies seem to transform when approached from different directions. Perhaps this work's most influential theme is the power of play to inform understanding. I am not an academic. I feel like a grown-up surrounded by toys, ideas that represent patterns in our experience, and I am reveling in the process of letting myself be led to what feels like unique ways for the ideas or patterns to interact.

Neoteny and the processes allied with neoteny wind all through this text. Neoteny is the process that carries or prolongs embryo or infant features forward through generations so that ancient ancestor early ontogenetic traits appear in the adults of descendants (Gould, 1977). Some have surmised that the hairlessness of progenitor human embryos made current human adults mostly hairless as that ancient embryo feature was carried through to contemporary adults (de Beer, 1951). Neoteny is also closely associated with a hypothetical compulsion to play as this ancient forebear infant feature emerged in the adults of the present day.

This work proposes that our species evolved along a five-step continuum, a progression that can be explained by how we've been impacted by sexual selection. I believe that sexual selection was instrumental in our evolving our unique form of consciousness.

Sexual selection can only be understood in the context of social structure. Social structure will be redefined in a new and specific endocrinological context that breaks down social structure into four different paradigms, two matrifocal and two patrifocal. This will open up an understanding of how social structure and the environment compel biological and social change by impacting maturation rates–through moderation of testosterone levels–and by varying maturation timing–through modification of estrogen.

This work suggests that there is no difference between biology and society. Until now this has been difficult to discern. Sociobiologists and evolutionary psychologists have attempted to show how Darwin's (1859) theory of natural selection could be leveraged to explain social transformation. I will suggest that a more powerful and useful social

model emerges when biological evolution is explored using an integration of all three of Darwin's theories and the work of Darwin's contemporaries, the Neo-Lamarckians (Gould, 2002). This theory is not as simple as the "Row, Row, Row Your Boat" melody of a current reductionist hypothesis but instead seeks to offer the kind of depth, symmetry and elegant complexity evident in a work by Bach.

This is a work of conjectures that asks you to consider the following points. a) The sudden drop in the age of puberty onset over the last 100 years (Saugstad, 1989; Badcock, 1991) shows evidence of an evolutionary dynamic in contemporary times and emphasizes the speed with which evolution can unfold. b) The curtailing of the final stage of cerebral development by early puberty (Saugstad, 1989) directly and negatively influences the ability of western individuals to have spiritual experiences, contributing to the social complications of artificially generated altered states. c) Human migration patterns influence cerebral development. African diasporas have deeply affected the neurological make-up of these cultures suffering the effects (over generations) of nonindigenous diurnal solar cycles on equatorial hormonal/neurological structures. Even primogeniture laws can influence evolution by driving youngest progeny to congregate overseas. d) When you cross two individuals of the same species that have diverging lines several thousand years old, there is often a reversion of the offspring to features characteristic of the last common progenitor (Darwin, 1859) So, too, with humans. We believe that here may be a partial explanation of several developmental disorders and extraordinary talent clusters. e) Evolution evolves. The evolutionary selective processes themselves reveal a meta-evolution. f) Female infanticide is the exhibition of sexual selection in patrifocal social structure. By reducing the number of females, only the males with socially sanctioned combative features procreate. There is much more. At the end of this work, I offer a number of unique postulates and predictions.

This is not unlike taking a central theme and playing it with different instruments at different speeds in varying contexts. By approaching the material from several angles, we will see relationships emerge and join to evoke deep sense.

3
Neoteny

> Humans and chimps are almost identical in structural gens, yet differ markedly in form and behavior. This paradox can be resolved by invoking a small genetic difference with profound effects–alterations in the regulatory system that slow down the general rate of development in humans. Heterochronic changes are regulatory changes; they require only an alteration in the timing of features already present. (Gould, 1977, p. 9)

I have found that definitions of neoteny that I provide to friends often don't easily stick in their mind. To ask someone to think of an automobile accelerating is easy. It is not too difficult to ask people to make a picture in their mind's eye of an accelerating automobile changing its model year to acquire future features while speeding up, decelerating to change shape to look like old models. But it is more difficult to ask that they perform this animation while considering a long succession of automobile models, with each succeeding vehicle behaving a little differently from the one before, differently in a fashion where its ability to change model year with speed is enhanced or compromised with time. Minds' eyes sometimes can use a little tuning.

Neoteny is the biological process, one of six heterochronic dynamics as described by Gould (1977), which prolongs ancestor embryo, infant and childhood features and displays them in the physical bodies and behaviors of descendant adults. The classic example is our ancient chimpanzee-like forebear infant features of small jaw, small teeth, big head, relatively large brain, upright stature, vertical skull positioning (Cope, 1877; Montagu, 1989), playful disposition, curiosity (Robbins, 1980), social dependency and displays of affection prolonging to stay engaged later and later in childhood over the course of successive generations until these features appear not only in the young, but in adults.

Gould (1977) lists over 30 contemporary human features formed from ancient forebear infants. Montagu (1989) lists additions:

> Neotenous Physical Traits in Humans. Cranial flexure, head situated over top of spine, forward position of foramen magnum, forward position of occipital condyles, lack of heavy brow ridges, orbits under cranial cavity, flatness of face (orthognathy), contact between sphenoid and ethmoid bones in anterior cranial cavity, retarded closure of cranial sutures, large size of brain, round-headedness.... Small jaws, small face, large braincase, small teeth, late eruption of teeth, prominent nose, absence of cranial crests, thinness of skull bones, gracile skeleton, thin nails, nonrotation of big toe, relative hairlessness of body, lack of pigment in some groups, curvature of pelvic axis, lack of pronounced physical differences, anterior position of vagina, downward direction of vagina, persistence of labia majora, persistence of hymen, persistence of penile prepuce. (p. 23)

Imagine that your great grandmother loved and played harmonica until she was six. Your grandmother enjoyed playing until she was ten. Your dad played until he hit puberty, then quit. Now you, grown up, play harmonica a little bit each day. You might say harmonica playing displayed a neotenic trajectory over the course of four generations. It has been estimated that neoteny influenced human evolution over the course of maybe 100,000 generations.

Acceleration is the opposite of neoteny (Gould, 1977). With acceleration, ancestor adult features withdraw, instead of prolonging, to appear in the childhood of descendants. If mammoths were originally warm-weather elephant-like creatures, and they needed more hair and aggression to survive difficult winters, then they might have taken elephant adult-like tendencies to have more hair and aggression and placed those tendencies in younger members of the species, until eventually over the course of generations both adults and children displayed more hair along with crusty dispositions.

Though with humans the drift in a neotenous direction occurred over the course of many generations, studies have been conducted on foxes that show radical changes in look and disposition in a mere 20 years (Trut, 1999; Rogers, 2005).

> Belyaev, who was in charge of a huge fox-fur farm in Novosibirsk, wanted to develop a strain of foxes that would more readily tolerate contact with people. Of a study population of 465 foxes, he selected the 10 percent who were most calm and curious toward people and displayed the least fear or aggression. He bred among this group and continued selecting for succeeding generations. After only twenty generations he had 'naturally tame animals that . . . would search for their keepers, climb on them . . . sit on the windowsill waiting for someone to approach, roll over to get their tummies rubbed, and let people carry them around and give them their shots.' They would wag their tails that turned up at the end, like dogs. They barked like dogs, as foxes almost never do in the wild. These surprisingly speedy and diverse changes were produced by inducing neoteny, so that the foxes reached sexual maturity while continuing to behave like immature animals . . . . Belyaev's tame foxes came into heat twice a year, instead of once, just as dogs can breed twice a year and wolves only once. (Rogers, 2005, p. 20)

In addition, after 20 years these foxes started licking the hands and faces of familiar people, their annual fur molting in some cases stopped, ears drooped like dogs and piebald coat coloration emerged (Trut, 1999).

A number of authors (e.g., Trut, 1999) have described how differences in dog breeds can be ascribed to the degree that a breed has been influenced by neoteny, or the prolongation of ancestor wolf cub features to appear in the adult of dog descendants. Selecting specific tame behaviors featured by the very young resulted in physiological transformations that included animal size, skull shape, coat variation, dog age and more promiscuous mating strategies.

In Mexico, there is a salamander-like creature called an axolotl. It has external gills and spends its whole life in the water. Change the axolotl environment, remove the water, and the axolotl, over a generation, will adjust to become indistinguishable from the North American salamander (McKinney & McNamara, 1990). The North American salamander lives on land and uses lungs.

> Probably the most familiar metamorphic heterochronies are those of salamanders, especially the axolotl. In one of the simplest changes, (indefinitely) delayed secretion of the thyroid hormone thyroxine will result in delayed metamorphosis. The result is that larval somatic traits are never lost although sexual maturation and large size will be attained (see Raff and Kaufman, 1983, for review). Similar delays are common in frogs (e.g. Emerson, 1986) and insects (Matsuda, 1987). (McKinney & McNamara, 1990, p. 63)

The larval, or embryonic, stage of the salamander is the axolotl. This creature can evolve or adjust maturation to offer descendants a choice of a larval version (living in the water) or an adult version (living on the land). Both forms reproduce. The axolotl features neotenous characteristics of the salamander. Or, you might say that the salamander exhibits acceleration (Gould, 1977) regarding axolotl features. The absence or presence of water determines which form this axolotl/salamander takes (McKinney & McNamara, 1990), which is an environmental effect.

This work explores the power of neoteny and acceleration to explain evolution and transformation at a biological, social, ontogenetic and personal scale. What I am calling The Orchestral Theory of Evolution has to do with the adjustments of maturation rate and timing. Although at these four scales the process is driven by the influences of social structure and the environment upon testosterone and estrogen, which impact rate and timing, I will also suggest that adjustments in the rate and timing of systems over time, at other scales, may follow the same dynamic.

4

Short History of Heterochrony

> Alberch et al. (1979) showed that between ancestor and descendant, development can either be reduced (resulting in paedomorphosis) or increased (resulting in what they termed peramorphosis). Each could be produced by three processes, involving: developmental rate change, change in onset time of development, or change in its offset time. In the case of paedomorphosis, reduced rate is neoteny; delayed onset time is postdisplacement; and earlier offset is progenesis. For the opposing case of peramorphosis, increased rate of acceleration; earlier onset predisplacement; and delayed offset hypermorphoses. These six processes could therefore describe all heterochronic processes. (McKinney & McNamara, 1990, p. 11)

On the Genesis of Species by George Mivart (1827-1900) was published in 1871. Its title suggests Mivart's primary point that Darwin's theory of natural selection emphasizes how species achieve stability, while Mivart hypothesizes that the origin, or genesis, of species has little to do with natural selection but everything to do with variation in progeny. Mivart (1871) believed that this variation was created by the acquiring of characteristics from parents exposed to varying environments compelling use or disuse of specific organs. Mivart was a Lamarckian. In other words, Darwin's natural selection operates on what was "born fit" (Gottlieb, 1992), as opposed to a 'survival of the fittest.'

Gottlieb (1992) describes an important nuance of Mivart's position, that evolution can unfold according to environmental pressures on embryos, directly influencing the features of individuals. Mivart (1871) was the first theorist to emphasize the influence of the environment directly on early growth, although the idea had originally been brought forth by Bonnet. Individual ontogeny, influenced by the environment, experienced changed growth trajectories, which evidenced themselves in revised behavioral and physiological features. Mivart (1871) emphasized that these features were inheritable by progeny.

Von Baer's work regarding embryonic ontogeny had been examined by Darwin and used to support his position that evolution had occurred. Mivart's use of this same material suggested that evolution may have occurred specifically by changes in ontogeny, in early growth, which compelled evolution to diverge in just the ways that von Baer had been describing.

Edward Drinker Cope's *The Origin of the Fittest: Essays on Evolution* was published in 1887, followed in 1896 by *The Primary Factors of Organic Evolution*. Cope, along with Alpheus Hyatt, led the American Neo-Lamarckian movement of evolutionary theory (Gould, 2002). Soaking up nuances of theory from a vast variety of sources, Cope gave birth to many new concepts, several of which have powerful relevance to the synthesis that my work represents.

Cope, like Mivart, placed a heavy emphasis on the origin of variation. Criticizing Darwin for paying relatively little attention to the processes behind the generation of variation, Cope (1887) described in detail the manifestation of those processes through what he called the acceleration and retardation of evolutionary development:

> If the parents were like the individuals of the more completely grown, then the offspring which did not attain that completeness may be said to have been retarded in their development. If, on the other hand, the parents were like those less fully grown, then the offspring which have added something have been accelerated in their development. (p. 10)

Cope (1887) believed that natural selection performed the vital job of preserving species once they had been created, but that the generation of genera was caused by the environment compelling the use and disuse of organs. Cope's view of species was informed by his focus on the changing states of development. The most profound change, differences between genera, occurred through variation caused by the environment. He believed that species change could be caused by natural selection (Cope, 1887).

Haeckel (1834-1919) and Cope carried several concepts in common, yet they differed in some important areas. Cope described his own general processes in Haeckelian phrases while improvising into important theory what were, in Haeckel's (1897) terms, idiosyncratic exceptions. One theory, what we now call mosaic evolution, Cope (1887) conceived of as a common evolutionary deviation whereby an individual organ or part of a body diverges during species evolution so that instead of an "exact" parallel development of all body parts, there is an "inexact" metamorphosis, with different parts of a single individual diverging as those parts respond to different pressures.

Although he was a supporter of natural selection as a preserver of species, Cope, as a Lamarckian, believed in the use and disuse of organs caused by the influence of the environment (Gould, 2002). Cope (1887) wrote that adolescent individuals were most vulnerable to the results of use and disuse, causing the acceleration or retardation of features inheritable by progeny. Species change according to transformation in one of these two directions, propelled by the advantages of bodily functions responding to changing environmental conditions. Natural selection freezes those transformations, stabilizing species change.

As an example of this process, Cope (1896) described transformations experienced by a species of brine shrimp from 1871 to 1874. Their natural environment was dramatically changed by a radical variation in temperature and salinity, resulting in a species transformation several times over, and a new genus was generated. Researchers were able to reverse the process by removing the shrimp and running the sequence backwards. Cope (1896) also noted that diet apparently could radically affect the appearance of species under domestication, an issue Darwin had earlier addressed.

Diverging from Mivart's (1871) conclusions that the environment can profoundly influence an individual early in ontogeny resulting in evolutionary change, Cope (1896) believed the adolescent and adults of a species were most easily impacted by the environment. These individuals manifested the impact in the form of acceleration or retardation.

> The results as bearing on the doctrine of evolution were published in 1869 (in 'The Origin of Genera'). It was there pointed out that the most nearly related forms of animals do present a relation of repression and advance, or of permanent embryonic and adult type, leaving no doubt that the one is descended from the other. This relation was termed exact parallelism. It was also shown that, if the embryonic form were the parent, the advanced descendant was produced by an increased rate of growth, which phenomenon was called acceleration; but that if the embryonic type were the offspring, then its failure to attain to the condition of the parent is due to the supervention of a slower rate of growth; to this phenomenon the term retardation was applied. It was then shown that the inexact parallelism was the result of unequal acceleration or retardation; that is, acceleration affecting one organ or part more than another, thus disturbing the combination of characters which is necessary for the state of exact parallelism between the perfect stage of one animal and the transitional state of another. Moreover, acceleration implies constant addition to the parts of an animal, while retardation implies continual subtraction from its characters, or atrophy. He had also shown ('Method of Creation,' 1871) that the additions either appeared as exact repetitions of pre-existent parts, or as modified repetitions, the former resulting in simple, the latter in more complex organisms. (Cope, 1887, p. 125)

Cope (1887) believed that a combination of both an increase in the number of stages in a succession of species (acceleration) and a decrease of those stages (retardation) provided a balance that supplied the engine behind evolution:

> I believe that this is the simplest mode of stating and explaining the law of variation: that some forms acquire something which their parents did not possess; and that those which acquire something additional have to pass through more numerous stages than their ancestors; and those which lose something pass through fewer stages than their ancestors; and these processes are expressed by the terms "acceleration" and "retardation." (p. 297)

Cope (1887) offers several examples of the process. He commonly refers to salamanders, and snakes pictured in his work show clearly how the sequences of transformation manifest themselves in his scheme.

Cope (1887) believed that cases of acceleration outnumbered examples of retardation. The force responsible for this tendency to accelerate over time he called "bathmism" (Cope, 1887, p. 226).

Hyatt and Cope parted in their view of evolution in very few areas and considered themselves the joint custodians of several concepts (Gould, 1977). Hyatt did not agree with Cope's belief that retardation was the complement to acceleration. In Hyatt's view, all species transformations could be explained by acceleration, with the apparent withdrawal or reversion into former stages being explained by a natural reemergence of early ontogenetic stages very late in an accelerated process, an exhibition that might be compared to senility in human development (Gould, 1977).

Referring to the 1863 work of Sedgewick, Cope (1896) discusses the importance of memory located in the germ (reproductive) cells, which is responsible for the ability of species to metamorphosize forward and backward in ontogenetic time, following the trail of their forebears. Rejecting Darwin's (1868) particles, or gemmules, Cope (1896) proposed an 'energy' capable of transferring the adaptive lessons engaged in by an organ (during use or disuse) so that the germ could log in, store and pass on the revisions. Cope (1896) discusses how Weismann in 1893 agrees that there is evidently some process able to pass information through to the germ, a Lamarckian concept contrary to the Weismann/Mendel synthesis (Jablonka & Lamb, 2005) and the still later Watson and Crick (1953) Central Dogma that would coalesce in the not too distant future. Butler (a notorious critic of natural selection) in 1878 also subscribed to the concept of heredity, or inheritance, tied directly to a memory store in the germ (Blacher, 1982).

Cope's conceptual tools provided him with the opportunity to be the first (after Saint-Hilaire) to reveal a feature unique to humans, relative to its closest living relatives, what he described as developmental retardation, known today as neoteny, or the maturational prolongation of infant features into adulthood.

> It must be noted here that the difference between the young and embryonic monkeys and the adults is quite the same as those just mentioned as distinguishing the young from the adult of man.... The change, however, in the case of the monkeys is greater than in the case of man. That is, in the monkeys the jaws and superciliary ridges become still more prominent than in man. As these characters result from a fuller course of growth from the infant, it is evident that in these respects the apes are more fully developed than man. Man stops short in the development of the face, and is in so far more embryonic. The prominent forehead and reduced jaws of man are characters of 'retardation.' (Cope, 1887, p. 287)

"Neoteny," a term coined by Kollman in 1885 (Gould, 1977), was applied by Cope to humans. Cope (1887) believed that neoteny explained the difference among the human races, causing chimpanzee features in certain non-Europeans. Focusing on the African physiology as an example, he asserted the superiority of the European/American type. Cope used his theory of acceleration and retardation to support his cultural biases (Gould, 1977). Darwin withdrew from an examination of female sexual selection when applied to humans because it might have resulted in conclusions contrary to the established social norms (Gould, 1977). Likewise, Cope's insights pertaining to the possible influence of acceleration and retardation on varying populations of human beings was inhibited by social conventions that demanded the association of European white features with what is considered most advanced in evolutionary progress (Gould, 1977).

Ernst Haeckel was not the first recapitulationist, but he was its strongest proponent (Gould, 1977). Kielmeyer, in 1793, introduced the concept (Gould, 1977). Haeckel (1987) popularized Darwin's evolutionary theories in Germany in work that was translated into more than 20 languages (Gould, 1977). He was a proponent of both Lamarck and natural selection (Gould, 1977). He deeply respected von Baer, who agreed with little that Haeckel had to say (Gould, 1977). Haeckel was a popular writer and a scathing critic of those that disagreed with him (Gould, 1977).

> Haeckel, in a statement of 1877, contended that 'the cell consists of matter called protoplasm, composed chiefly of carbon, with an admixture of hydrogen, nitrogen and sulphur. These component parts, properly united, produce the soul and body of the animated world,

> and suitably nursed become man. With this single argument the mystery of the universe is explained, the Deity is annulled, and a new era of infinite knowledge ushered in. (Eiseley, 1958, p. 346)

Haeckel could be described as an eloquent materialist (Gould, 1977; Gould, 2002) with a very powerful focus. He was firmly grounded in both Lamarck and Darwin's natural selection (Haeckel, 1897). Like Mivart, Cope and Hyatt, Haeckel (1897) believed that the environment, through the use and disuse of organs, targeted variation to exhibit specific features that natural selection stabilized by culling out those individuals that couldn't make it to procreation age. His primary message included the idea that only at the adult stage were individuals malleable enough to be changed, and that evolution progresses by the adding on of these revisions at the end of ontogeny (Gottlieb, 1992). Cope emphasized adolescent and adult vulnerability to environmental influences; Mivart believed that embryonic stages were easily influenced (Gould, 1977). Haeckel (1897), by emphasizing the final, or adult, stage, and by insisting that ontogeny or growth directly reflects this addition of features only at the final stage, compels the realization that ontogeny is an unfolding of miniature adults–that ontogeny recapitulates phylogeny.

Making possible this process, that ontogeny unfolds by repeating the adult stage in the adult phylogeny of all ancestor species, is what Haeckel (1897) called "condensation." Condensation is the squishing, accordion-like, of all ancestral stages into compact, brief representations, making possible an individual's growth in a reasonable period of time. This idea was contrary to von Baer's original conjectures and removed from the process the zygote and embryonic stages of growth as possible sources for environmental influences (Gould, 1977). Haeckel's popularity and verve shifted focus away from alternative possible sources of evidence for the origin of variation. Thus, it was to be some time before there could be a focus on ontogeny itself.

Haeckel, while concentrating on his overarching theme of evolution–recapitulation–or ontogeny recapitulating phylogeny, created names for the processes that describe the exceptions to this rule. Gould, in his *Ontogeny and Phylogeny* (1977), outlines Haeckel's exceptions:

> By far the most important were embryonic and juvenile adaptations. His favorite examples included the adaptations of free-swimming larvae to their own environments, and the superficial differences in cleavage and gastrulation that arise from variations in yolk content and obscure the unity of early development. But Haeckel also established a second category of cenogenesis: temporal and spatial dislocations in the order to inherited events. These include: (1) "heterochrony" - displacement in time, or dislocation of the phylogenetic order of succession (in the ontogeny of vertebrates, for example, the notochord, brain, eyes, and heart arise earlier than their appearance in phylogeny would warrant); (2) "heterotopy" - displacement in place. (p. 82)

Haeckel (1897) coined the word "heterochrony," which we now use to describe changes in rates and timing of ontological growth.

Beginning with the work of Wilhelm His (1831-1904) and the experimental biologists (Gould, 1977), baby and bathwater went flying out the window. Swan (1990) makes the point that a concordance between ontogeny and phylogeny has much to offer:

> However, this discrepancy became understandable when it was realized that the newborn infant concords very well with 20 million years ago in the Miocene epoch, when our ancestors were apes of some sort. Newborn infants can often grasp and suspend themselves and even swing enough to suggest brachiation. Their hallux or big toe is often highly movable and the rest of their feet (showing a slope of their curled toes that is virtually transverse) are apelike. In an evolutionary sense, a newborn concords well with some ancestral Miocene ape. However, after nine months of a year, when the curve is found at the time of birth, a child approaches the evolutionary present. It starts to stand erect and practices with its lumbar curve before it walks upright. Its hallux assumes a forward position, and it starts to acquire the normal slope of human toes. The chin acquires a better-defined protuberance that expresses Homo sapiens as a species, and the jabberings of an infant transform into human speech. (p. 383)

Haeckel noted the nature of these relationships. He suggested that

increases in human brain size might be related to the freeing up of the hands when an upright stature was attained (Bowler, 1984). Yet, as a sort of P. T. Barnum of evolutionary theory, Haeckel might, in the end, have educated less than he entertained. The focus was on recapitulation almost exclusively, and the potential magic of alternative theories of evolution disappeared.

Even Wallace (1895), not a believer in sexual selection or heterochronic interpretations of evolution, noted incongruities:

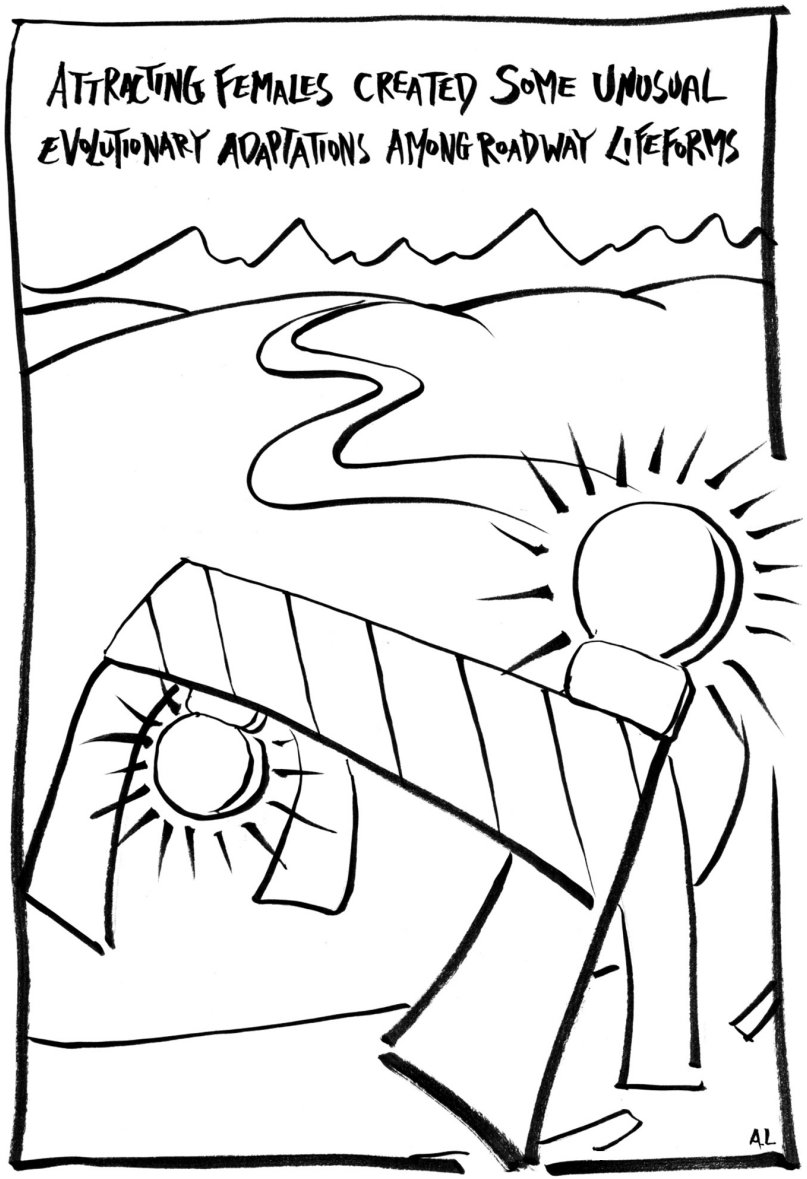
> Two characters could hardly be wider apart than the size and development of man's brain and the distribution of hair upon the surface of his body, yet they both lead us to the same conclusion—-that some other power than natural selection has been engaged in his production. (p. 197)

These names, Mivart, Hyatt, Cope and Haeckel, are not much referred to these days. Though Neo-Lamarckianism is seeing a resurgence in the work of evolutionary developmental biologists (Arthur, 1997; Carroll, 2005; Jablonka & Lamb, 2005; Gilbert & Epel, 2009), heterochronic theory is little noted. By integrating an understanding of the womb dynamics that Cope intuited with an understanding of the ability of social structure to compel changes in hormonal constellations, an alternative modern synthesis is suggested, one with a different constellation of sciences than the synthesis of the mid-twentieth century.

Much of this new heterochronic dynamic revolves around an understanding of the specific hormones responsible for the processes described by Hyatt, Cope and Haeckel. The processes were also described by Darwin in his *The Variation of Animals and Plants under Domestication* (1868). Endocrinology makes a profound contribution. Anthropological and biological studies of social structure and sexual selection are integral to understanding heterochronic transformation. Neuropsychology reveals the effects of changing hormone levels on lateralization (Geschwind & Galaburda, 1987; Annett, 2002), infant and pubertal synapse pruning, handedness (Geschwind & Galaburda, 1987), autism (Baron-Cohen, Lutchmaya & Knickmeyer, 2004; Auyeung, Baron-Cohen, Ashwin, Knickmeyer, Taylor & Hackett, 2009), other conditions featuring maturational delay and acceleration and numerous diseases (Geschwind & Galaburda, 1987) correlated with hormonal outliers.

If heterochrony is the study of the rates and timing of maturation, with testosterone levels impacting rate and estrogen levels controlling timing, then those environmental or social structure adjustments that influence levels of testosterone and estrogen determine the speed, timing, features and direction of evolution.

Mivart, Hyatt, Cope, Haeckel and Darwin were struggling for an endocrinological solution to the riddles they perceived. Only now do we have the information that these men craved. By returning to the work of Darwin and his contemporaries, we can embrace and integrate the anomalies made invisible by the current paradigm, and we can move forward with a more useful model.



II Biology and Society

5

Social Structure and Human Origins

> The two characteristics affected by such a process, namely plumage development in the male, and sexual preference for such developments in the female, must thus advance together, and so long as the process is unchecked by severe counter selection, will advance with ever-increasing speed. In the total absence of such checks, it is easy to see that the speed of development will be proportional to the development already attained, which will therefore increase with time exponentially, or in geometric progression. There is thus in any bionomic situation, in which sexual selection is capable of conferring a great reproductive advantage, the potentiality of a runaway process, which, however small the beginnings from which it arose, must, unless checked, produce great effects, and in the later stages with great rapidity. (Fisher, 1930, pp. 136-7)

Evolutionary theory is not a catalog of impacts that come as the result of a single selective process. Darwin noted three main areas that selective interventions seemed to cluster around, natural selection, sexual selection and Lamarckian selection. Different selective processes evidence themselves in different areas. To even discuss the selective processes as separate is to perhaps indulge in a peculiarly human trait to divide up the indivisible into constituent parts in order to make possible an ability to make predictions. Nevertheless, this is what I feel compelled to do. Let's see if the indulgence offers useful outcomes.

What Mivart, Hyatt, Cope, Haeckel and Darwin succeeded in doing was to place enough puzzle pieces on the table that we late arrivals to the party are able to see a larger picture. This larger picture, an adjusted, powerful theory of evolution, has applications to how humans biologically and socially evolved. Hypothesizing that testosterone and estrogen are central to the process, I will start with how heterochronic theory, integrated with an understanding of social structure, influenced by the environment, explains how societies evolve.

In this model, or theory, there are eight varieties of humans, four male and four female. These eight types of humans feature specific characteristics, or tendencies. Each type of human can be influenced by other types, and each is susceptible to specific features in the environment. Environmental influences can compel the progeny of these types of humans to transform into other types of humans. These environmental influences compel evolutionary currents, which can provoke a significant transformation within a single generation. More often, however, these transformations occur over the course of centuries or longer.

Similar to Watson and Crick's (1953) double helix, a larger body is created from an assembly of component parts. In this case, societies are made up of eight types of human beings, each of whom represents one of the eight potential combinations derived from the hormonal extremes. The hormonal extremes form a structure that serves as a template for a large number of the individuals within a society. The majority of individuals within a society will exhibit some basic features associated with these hormonal extremes, yet they will exhibit these extremes to *less* of a degree than the eight prototype humans.

Imagine that the eight basic artist colors (purple, red, blue, yellow, orange, green, black and white) are all being blended in specific ways to paint the character of a society. Or, consider that instead of the two planets Mars and Venus, which represent the classic male/female dichotomy (Gray, 1992), there are eight planets—four female and four male—which together comprise a pantheon of eight gods and goddesses.

Female Constellations
High testosterone, high estrogen (F TE)
High testosterone, low estrogen (F Te)
Low testosterone, high estrogen (F tE)
Low testosterone, low estrogen (F te)

Male Constellations
High testosterone, high estrogen (M TE)
High testosterone, low estrogen (M Te)
Low testosterone, high estrogen (M tE)
Low testosterone, low estrogen (M te)

As in the double helix, there are natural complementary pairings. In this framework, opposite sexes are not only drawn to each other based on sexual attraction, but they are also drawn to each other based on the attraction to their complementary opposite hormonal counterparts.

Female te/Male TE
Female tE/Male Te
Female Te/Male tE
Female TE/Male te

The complementary counterparts naturally ally themselves into patrifocal and matrifocal social structures. There exist two variations within each.

F TE/M te Classic Matrifocal
F tE/M Te Warrior Patrifocal
F te/M TE Conventional Patrifocal
F Te/M tE Contemporary Matrifocal

Conventional Patrifocal: Domineering, caring and discriminating men who choose cooperative women.

Warrior Patrifocal: Domineering men who choose cooperative, caring and discriminating women.

Contemporary Matrifocal: Commanding women who choose creative, cooperative, caring and discriminating men.

Classic Matrifocal: Commanding, caring and discriminating women who choose creative and cooperative men.

These fundamental paradigms are flexile and have an ability to transform from one societal prototype into another over time. The human hormone thresholds can vary over time and can control the speed and direction of human biological evolution and social transformation. The thresholds or fulcrums where change occurs can be influenced at three locations within two interlocking cycles, or feedback loops, to be described later in this work.

This is a model, developed to explain how humans evolved and societies change, and how particular diseases and conditions emerge and congregate in specific individuals, families, subcultures and societies. I believe this model is useful in some situations and less useful in others. In other words, don't get hung up on the truth of this model, or construction. Walk with me as we explore its use. Let's explore how this dynamic unfolds over the course of human evolution. The following just so story provides a foundation premise with which to view both human biological evolution and social transformation as part of the same evolutionary dynamic.

Consider a five-step evolutionary continuum that begins with natural selection but then moves to sexual selection. In this continuum, animals focus on particular patterns when they choose a mate. Step three begins with crossing a bridge over to human sexual selection, where adept practitioners of novel pattern creation are selected as procreation partners by mates with sensitivity to these nuances (Miller, 2000), and they communicate mostly via gesture (McBride, 1973; Hewes, 1973). The fourth step is taken when novelty itself becomes desirable outside the partner selection process, and society is thus compelled to embrace in its productions countless nuances of the new. This is the unique human sexualization of experience. In the fifth stage, awareness of the creation process itself becomes a target experience.

1. natural selection
2. sexual selection (selecting for pattern when seeking a mate)
3. human sexual selection (selection for novel pattern when seeking a mate)
4. art and culture (selecting for novel pattern outside of mate selection)
5. awareness of the selective or creative process

This is viewing human evolution as a function of sexual selection within social structure, impacted by environmental change.

> The possibility of runaway sexual selection for mental traits in humans has never to my knowledge been discussed before. So sexual selection through mate choice is the one great evolutionary process that has never been used as a possible explanation for human mental evolution, or for the rapid increase in brain size in our lineage. And the reasons for this neglect are historical and ideological (e.g., Victorian sexism and mechanistic behaviorism) rather than scientific. (Miller, 1994, p. 143)

Relying upon the sequence established above is the hypothesis that humans evolved from random-handed non-speech users (Annett, 2002; Crow, Done & Sacker, 1996) with two equally large cerebral hemispheres and a wide corpus callosum (Witelson & Goldsmith, 1991). I hypothesize that step three of this sequence is compelled by long-term male maturational delay (and female acceleration) and reinforced by sexual selection in a matrifocal context (Tanner, 1981), with child-like male features attracting more female focus (Gould, 1977). Classic Matrifocal was likely our social structure at this stage (Knight, 1991; Hrdy, 2009; Alvarez, 2004).

> But now let us return to the situation among humans. We have seen that Homo sapiens has a queer arrangement in which both sexes must compete for partners, and both, in turn, must choose. The stage is set for trait-runaway by sexual selection to take place in an unusual two way mode — acting not only on males, but on females as well. Human runaway sexual selection? At first glance we would seem too sensible a species for anything like that. We don't appear to have been saddled with burdensome exaggerations like antlers or bright tails. Or have we? Consider the greatest exaggeration of them all . . . our powerful, out-sized brains. Not only do large infant craniums put human mothers in great stress while giving birth, the brains within strike some biologists as extremely perplexing. In their cups, philosophical anthropologists can sometimes be heard wondering why humans "overshot" the mental capacity we needed in order to become masters of the planet — in other words, competent hunter-gatherers with stone tools and fire. That was enough to remove a lot of environmental stress, and should have led to a period of equilibrium. Instead, change only accelerated, until in short order we produced encephalization capable of conceiving mathematics, spacecraft design, and music more precise than any bird or whale could ever produce. (Brin, 1995, page number unknown)

Gestural communication (Corballis, 2002) featuring primary process (one time, one place, no opposites) consciousness (Bateson, 1972) supports this matrifocal or matrilineal/matrilocal (Hrdy, 2009), sexually selected (Miller, 2000), dance-driven (Condon & Sander, 1974; Mithen, 2006), neotenic (Brin, 1995), brain-growing, aesthetic-based (Miller, 2000), egalitarian (Boehm, 1999) paradigm.

> The notion that man's first language was primarily gestural, carried on with hand and arm signals rather than vocal sounds, has been supported by a distinguished line of scholars: Condillar (1746), Tylor (1868, 1871), Morgan (1877:35n), Wallace (1881, 1895), Romanes (1988), Wundt (1912), Paget (1944, 1963), and Johannesson (1949, 1950). The gestural theory seems to be the most attractive of the many glottogonic hypotheses advanced so far, and receives support from recent studies of chimpanzees and other primates, such as Gardner and Gardner (1969, 1971), Premack (1970a,b, 1971), and Menzel (1971), as well as from other sources. The fact that this evidence was unavailable to earlier proponents of the gestural theory explains some of the weaknesses in its former formulations. (Hewes, 1973, p. 5)

In this dance-driven protohuman society it is the women that we hypothesize bridged from gesture to speech earlier than the men, their brains having lateralized first. The women were maturationally accelerating while the men were maturationally delaying. (Details in later sections of this work.)

> For gatherers, the situation was different. Those women with the largest repertoire of communicable images of foods and their sources

> and secrets of preparation were unquestionably placed in a position of advantage. Language may well have arisen as a mysterious power possessed largely by women — women who spent much more of their waking time together — and, usually, talking — than did men, women who in all societies are seen as group-minded, in contrast to the lone male image, which is the romanticized version of the alpha male of the primate group. (McKenna, 1993, p. 55)

These ancient societies were matrilocal…

> The most common form of social organization for group-living monkeys is the multigenerational matrilineal group (Silk, 1987). In this type of system, males, and females have very different life histories. Females stay in the natal group and their mothers and female kin for life, while males leave at adolescence and transfer to neighboring groups for breeding. (Fairbanks, 2009, pp. 160-1)

…and relatively non aggressive…

> In spite of abundant evidence documenting intergroup conflict over the past 10,000 to 15,000 years, there is no evidence of warfare in the Pleistocene. Such absence of evidence is not evidence of absence, but it helps to explain why many of those who actually study hunter-gatherers are skeptical about projecting the bellicose behavior of post-Neolithic peoples back onto roaming kin-based bands of hunter-gatherers, and why anthropolotists refer to the Pleistocene as the "period of Paleolithic warlessness. (Hrdy, 2009, pp. 19-20)

Stage four suggests a shift toward patrifocal social structure as well as a decrease in brain size (Wiercinski, 1979), culminating in the Warrior Patrifocal social structure. This sequence suggests that Classic Matrifocal and Warrior Patrifocal preceded Contemporary Matrifocal as well as Conventional Patrifocal, with the possible emergence of Contemporary and Conventional in the last 5,000 years.

The following is the story that accompanies this dynamic.

> All at once Evered charged forward, leapt up to seize one of the hanging vines, and swung out over the stream in the spray-drenched wind. A moment later Freud joined him. The two leapt from one liana to the next, swinging into space, until it seemed the slender stems must snap or be torn from their lofty moorings. Frodo charged along the edge of the stream, hurling rock after rock now ahead, now to the side, his coat glistening with spray. For ten minutes the three performed their wild displays while Fifi and her younger offspring watched from one of the tall fig trees by the stream. Were the chimpanzees expressing feelings of awe such as those which, in early man, surely gave rise to primitive religions, worship of the elements? (Goodall, 1990, pp. 241-2)

Our genetic/environmental history is stored like a pocket roadmap of an almost endless roller coaster ride, tracking, among other things, the hormonal fluctuations of our ancestors. A patriarchal past stores a history of high testosterone males and low testosterone females. Further back in time, we lived matrifocal lives with high testosterone females and low testosterone males (van Anders, 2009). Back further still, we were just learning to use language in dance-driven tribal bands where females were revered societal leaders. Unceasing music, dance performance and ritual-based, promiscuous copulation provided the rhythm of their life.

Almost half of these male band members were left-handed. Females were far more verbally articulate than men. Puberty arrived unusually late. Dancing was the center of their life.

> If whole-body co-ordinated activities such as dancing can influence not only emotional but also hormonal states, this may provide a clue to why dancing takes up so much of the leisure time of so many hunting and gathering people, and why it is so often linked symbolically with the moon. It might also throw light on the mechanisms through which women eventually succeeded in preserving their ancient traditions of synchrony [menstrual] far from coastal shores in the course of the Upper Paleolithic revolution. It could be that they danced. Moreover, if dancing influenced the timing of ovulation and/or menstruation as well as of sexual intercourse itself, a further consequence may have followed. By scheduling each type of dance so as to coincide with a specific lunar phase, women could have helped ensure

> that their cycles were not only socially in step, but also in step with the moon. Alternatively, it may have been that by using the moon as a clock, and by dancing in time with it, women succeeded in keeping in synchrony with one another. (Knight, 1991, pp. 350-1)

Henry Jerison (1973) hypothesized that predators will have bigger brains than their prey. He suggested that it would take more brains to catch supper than to flee, that the predator, in search of a meal, utilizes and requires more brain mass than do the prey in their need to escape. Studies supported his conjectures.

> Both herbivores and carnivores displayed continual increase in brain size during their evolution, but at each stage, the carnivores were always ahead. Animals that make a living by catching rapidly moving prey seem to need bigger brains than plant eaters. And, as the brains of herbivores grew larger (presumably under intense selective pressure imposed by their carnivorous predators), the carnivores also evolved bigger brains to maintain the differential. (Gould, 1992, p. 190)

What possible conditions would have led human brains to evolve such massive size so quickly to create the massive organ in use today? What compelled the need for so many synapses? What was driving us forward? What were we chasing?

"Probably as a result of natural selection for endurance bipedal running, men and women have greater larger thyroid glands, and significantly larger adrenal glands and consequently greater hormone output than do rhesus monkeys and chimpanzees" (Spuhler, 1979, p. 458).

Neoteny is the biological process that prolongs ancestor embryo, infant and childhood features and displays them in the physical bodies and behaviors of descendant adults (Gould, 1977). Hypothetically, our chimpanzee-like or bonobo-like progenitors gave birth to infants that exhibited physical characteristics and behavioral features that resembled the physical features and behavioral patterns of contemporary human adults. Like humans, chimpanzee infants exhibit a brain size that is large relative to the size of their head, and, like modern humans, they display large eyes, small chins, small teeth and an upright carriage

(Cope, 1887; Montagu, 1989). In regards to behavior, chimpanzee infants typically exhibit curiosity, playfulness (Robbins, 1980), affection, sociality and an innate desire to cooperate. Neoteny suggests that the infants of our human ancestral forebear exhibited behavioral features that exist in contemporary human adults.

What might have driven human evolution to unfold in this neotenous direction?

Through the generations, changes in the rates and timing of maturation can dramatically speed up the evolution of a species. Furthermore, evidence suggests that sexual selection can directly influence the rate and timing of maturation, leading a species in a neotenous direction.

Those studies conducted with Russian silver foxes focused on long-term selective breeding strategies, revealing astonishing changes in both the appearance and behavior of future generations (Trut, 1999). In this experiment, ten percent of a population of 465 foxes was chosen that naturally behaved in a relatively tame manner by displaying neotenous characteristics such as curiosity and relatively little fear. Over the course of these experiments in selective breeding, the descendants of these foxes demonstrated remarkable physical changes (Trut, 1999). As I've noted, the foxes displayed changes in their fur coats. Colors appeared and they molted less. Their ears flopped down. Also, barking emerged and estrus became prolonged. Tails started wagging. Through the target breeding of tame features, researchers were able to precipitate striking somatic changes in descendant populations resulting in an increase in the future generation's readiness to cooperate (Trut, 1999). They become neotenous.

Jerison (1973) theorized that taxing the physical limits of a predator causes the animal's brain to grow in size. In our own evolutionary past, humans began to tax the ceiling threshold of what they could physically and mentally achieve. Then they continued to push that ceiling. There is only one thing that humans do that has no conceivable limit when it comes to success. That thing is art. Our species found a way to transcend nature's limitations on mental growth. We innovated the rhythmic art of movement, which permitted our brains to grow in size more quickly than predation could permit it to grow. What drove human evolution was the art of dance.

Once humans invoked the art of dance, potential mates selected their partners in procreation based on their ability to invoke deep emotion through dance (Miller, 2000). Jane Goodall's (1990) observations of chimpanzees, displaying in dance-like fashion at waterfalls and in thunderstorms, reflect an ingrained primate impulse to use movement to solicit sex as an expressive response to intense environmental stimuli. Once humans began to link noise, rhythm, movement and procreation, there emerged what Geoffrey Miller (2000) described as mutual selection between those performers displaying features that encouraged copulation and highly discriminating partners attracted to rhythm-infused rituals or routines. Brains exponentially increased in size because there was no ceiling in the number of synapses required for success. Brains grew larger in order to keep up with their larger-brained peers, peers who displayed increased prowess at dance, thus maintaining a selective advantage over the less adept artists. Humans, competing to become the best dancers, were manufacturing synapses as if they were chasing some highly intelligent, very picky prey. Which they were. Males and females were chasing each other.

Yet, because dance is intrinsically cooperative within a group-performance ritual, which served as the center of tribal life, overtly combative individuals did not achieve adaptive benefits from confrontational behavior. Because of this, dancers that featured an ability to accord with ritual cooperation and copulation consummation multiplied. Human beings developed brain mass that surpassed the predator in search of prey. Instead of seeking prey, males and females sought mating opportunities through the limitlessly innovative medium of dance.

As was the case with foxes, early humans targeted and selected those dancers that behaved cooperatively. In the context of collective dances, we became tamer as our brains enlarged. Because large brains and cooperative behavior are closely associated infant features, we automatically became tamer and more childlike as we grew an ability to dance, to appreciate dance and to perform.

By selecting talented dancers, our species altered our rate of maturation. The features of infancy became prolonged and visible in later stages of our development. This occurred while we continued to select for cooperative and tame mates. Becoming discriminating dancers with large brains was part of the natural dynamic of changing maturational rates. By selecting talented dancers, we prolonged infant features into later stages, choosing humans that were big-brained, cooperative and tame.

A million or more years of sexual selection with authoritative females picking the best male dancers came to an end. Males had been selected by the women for neotenous features that included cooperative natures, creativity and the big brains that made them astonishingly facile, extravagant dancers. Females were revered for all these things plus their management skills. They were marshalling infants to adulthood with no fathers; only brothers helped provide.

> Did ancestral hunter-gatherers likewise have matrilineal kin nearby? We cannot know for sure, but post-Alvarez, long standing barriers against thinking this was possible have disappeared. Instead of some highly conserved tendency, the cross-cultural prevalence of patrilocal residence patterns looks less like an evolved human universal than a more recent adaptation to post-Pleistocene conditions, as hunters moved into northern climes where women could no longer gather wild plants year-round or as groups settled into circumscribed areas. In the Middle East, people began to herd livestock and became increasingly dependent on growing crops, storing the surplus, and accumulating property. As group sizes along with population densities increased, people adjusted their behavior to these new demographic, dietary, epidemiological, and social realities.
>
> For settled people, shorter birth intervals and faster population growth, along with the accumulation of resources and the emergence of social stratification, brought with them the need to protect livestock and cultivable land as well as wives and children. Protecting such valuable resources became a higher priority than maintaining cordial and reciprocal exchange with neighbors. As outside invasions became more routine, men needed allies they could count on. Who better to rely on than close male kin? Increasingly, men sought to remain near fathers and brothers, obtaining wives from other groups. Only in the past 10,000 or so years has interclan warfare become an integral part of human lives, necessitating patrilocal residence pat-

terns and in the process changing the way that children are reared. (Hrdy, 2009, pp. 246-7)

The great shift from matrifocal to patrifocal social structure began perhaps 80,000 to 40,000 years ago (Thompson, 1981) when language firmly bridged over from mostly the females to both women and men.

> This situation is to be contrasted with what is required when enunciating words with precise meanings. Since the tongue is a midline organ, there must be synchronized action of both sides if there is not to be slurring of speech. Since the cerebral hemispheres are mirror images of one another, and since delay is involved in relaying information from one side to the other, it is unlikely that both could cerebrate exactly alike and 'speak as one voice.' Each side of the tongue might receive impulses for the same word at slightly different times, or, worse, receive the neural command for two different words. The result would be stammering or stuttering. Penfield and Welch have pointed out that upon stimulation of the motor cortex in human beings, the responsive movement is always on the contralateral side except for such structures as the tongue and pharynx that straddle the midline. (MacLean, 1990, p. 543)

The archeological record reveals that about 25,000 years ago (Wiercinski, 1979), the human brain was beginning to grow smaller. Great dancers were not the cat's pajamas anymore. Men were also picked by females for their gifts with words. Gesture abated. Right-handers proliferated. Cerebral hemispheres lateralized and corpus callosums reduced in size. The hormone roller coaster had finished peaking and was now picking up speed as it headed down.

Perhaps 1,000 generations later, we've hit bottom. The roller coaster is starting back up the hill.

6

Environment Compelling Societal Shifts

And the beat goes on. When friends are hooked up to electro-encephalographs, which measure brain activity, the resulting tracings show that even brain waves get 'in sync' when two people have a harmonious conversation. In fact, if you sit at the dinner table and watch carefully, you can conduct the conversation with your hand as family members talk and eat. Stressed syllables usually keep the beat. But even silences are rhythmic; as one person pats her mouth, another reaches for the salt—right on cue. Rests and syncopations, voices lowered, elbows raised, these mark the pulse of living as well as of love. Our need to keep each other's time reflects a rhythmic mimicry common to many other animals. On a number of occasions primatologist Wolfgang Kohler entered the chimp enclosure in a primate research center to find a group of males and females trotting in 'a rough approximate rhythm' around and around a pole. Kohler said the animals wagged their heads as they swung along, each leading with the same foot. Chimps sometimes sway from side to side as they stare into one another's eyes just prior to copulation too. In fact, nothing is more basic to courtship in animals than rhythmic movement. Cats circle. Red deer prance. Howler monkeys court with rhythmic tongue movements. Stickleback fish to a zigzag jig. From bears to beetles, courting couples perform rhythmic rituals to express their amorous intentions. To dance is natural. So I think it reasonable to suggest that body synchrony is a universal stage of the human courting process: as we become attracted to each other, we begin to keep a common beat. (Fisher, 1992, p. 31)

Eight environmental variables influence testosterone, including light (Geschwind & Galaburda, 1987), diet (Schmidt, Wijga, Von Zur Muhlen, Brabant & Wagner, 1997), body fat (Glass, Swerdloff, Bray, Dahms & Atkinson, 1977; Ross, Bernstein, Judd, Hanisch, Pike & Henderson, 1986; Hamalainen et al., 1983; Pasquali, Casimirri, Cantobelli, Melchionda, Labate, Fabbri, Capelli & Burtoluzzi, 1991), alcohol and drugs (Gordon, Altman, Southren, Rubin & Lieber, 1976; Castilla-Garcia, Santolaria-Fernandez, Gonzalez-Reimers, Bastita-Lopez, Gonzalez-Garcia, Jorge-Hernandez & Hernandez-Nieto, 1987; Ahluwalia, Clark, Westney, Smith, James & Rajguru, 1992), tobacco (MacMahon, Trichopoulos, Cole & Brown, 1982; Barrett-Connor & Khaw, 1987), touch, physical activity (MacConnie, Barkan, Lampman, Schork & Beitins, 1986; Morville, Pesquies, Guezennec, Serrurier & Guignard, 1979) and stress (Cumming, Quigley & Yen, 1983; James, 1986). Estrogen has been far less studied (Bogin, 2006), but diet has been repeatedly shown to dramatically influence estrogen levels (Ahluwalia et al., 1981).

Deep societal change can occur quickly when there is a change in hormonal constellations. Sudden shifts can occur from matrifocal to patrifocal, or patrifocal to matrifocal. For example, if a matrifocal society is highly stressed over time by patrifocal incursions, the ideal male mate may shift from one displaying cooperative tendencies to a male who is quick to fight (Hrdy, 2009). Formerly highly valued aesthetic-oriented males may then find themselves outside the pool of highly valued potential mates. In mere generations, physiological, hormonal and neuropsychological transformations can occur.

A radical change in diet, such as an increase in high-quality fats and nutrients, could raise a female's estrogen and testosterone levels and lower a male's testosterone levels (Glass et al., 1977; Ahluwalia et al., 1981; Hamalainen et al., 1983; Ross et al., 1986; Pasquali et al., 1991). These changes in hormonal levels would compel a shift in social structure toward the direction of female choice. Females would then seek mates that were cooperators rather than warriors.

Sudden dietary changes that drastically reduce access to high-fat foods could compel a hormonal shift toward a patrifocal social structure. These hormonal shifts would be further accentuated if combative

situations emerged. This is the variation of the Kuzawa (2008) thesis, which proposes that uterine environments can influence adult physiology. This thesis suggests that the parents' hormonal shifts can adjust a progeny's hormonal constellations and shift a society's hormonal spectrum in a particular direction, depending on environmental pressures. Such hormonal shifts thus result in modifications of social structure.

Sunlight impacts the pineal gland, which directly influences the testosterone levels within the individuals of a population (Geschwind & Galaburda, 1987). Migrating populations exposed to changes in sunlight may experience hormone level changes and social structure adjustments. A variety of specific diseases and conditions, including autism, acquired by the eight prototype hormonal outlier individuals, will emerge among these migrating peoples. Later, I will detail how the increase in autism in Scandinavian Somalis and Minnesota Somalis is directly related to pineal glands interpreting seasonal light variations as equatorial diurnal light variations, thus spiking uterine testosterone, which in turn compels progeny to experience extreme maturational delay (Schatzki, 2010) and acceleration.

It is possible that changes in sunlight that resulted from central African migrations to Southern Africa and Europe resulted in hormone changes, leading to lateralization adjustments (Geschwind & Galaburda, 1987) and the emergence of split consciousness and culture. I'll say more later on light influencing testosterone levels, thereby impacting lateralization.

> The diversity of human skills and the improbability that any one individual could be good at everything makes it reasonable to suggest that different genotypes, for different patterns of CD [cerebral dominance], are associated with various strengths and weaknesses that complement and balance one another in the population as a whole. (Annett, 2002, p. 186)

Annett's (2002) modern UK society exhibits an evenly balanced, static spectrum view of left-handed and right-handed individuals. On the far left side of this spectrum are the extreme left-handed, as well as the random-handed, and on the far right side of this spectrum are the extreme right-handed. Most people in a society exist somewhere

in the middle (Annett, 2002). This spectrum of individuals is aligned along a gradation curve and offers a static snapshot of our society in the process of transition. The older, anomalously dominant (both cerebral hemispheres close to the same size), matrifocal prototype is stationed at the left side and balances those with cerebral asymmetry designed for speech facility, the patrifocal prototype, on the right. Annett's Right Shift Theory (Annett, 1985) argues that cerebral asymmetry with language proclivity offers a heterozygote advantage that allows the moderate right-handed to occupy the center of society. The Orchestral Theory integrates social structure, maturation rates and a long-term evolutionary arc into Annett's static snapshot in time.

Stepping back to our premise, *those environmental or social structure adjustments that influence levels of testosterone (impacting rate of maturation) and estrogen (influencing the timing of maturation) determine the speed, timing, features and direction of biological and social evolution.*

7
Societal Balance

Edward Westermarck in his early classic A Short History of Marriage (1968:126-155) discussed consent as a condition for marriage. Females, he noted, most often were married off at the will of some male–father, family elders, uncle. It is to be noted that the male partner in such marriages, also, had little personal choice. However, Westermarck pointed out that females in the simplest hunting and gathering societies could–and did–refuse the assigned mate. Sometimes she could do this directly and in other societies by subtle, indirect action. She lost much of this freedom in technologically more advanced societies. Some of the strongest arguments against male dominant choice of females as sex partners can be found in the statistical, cross-cultural work of George Murdock (1949:20-21). Out of 241 societies where his criteria could be applied, 163 involved some consideration: bride-price, bride service, or exchange of women. In other words, families made the decisions rather than the individuals involved. Regarding divorce, Murdock (1969:175-76) found, somewhat surprisingly, that in thirty of forty societies there were no substantial differences in the rights of men and women to terminate a marriage. Only 15 percent actually had the stereotyped view where men controlled the action. If divorce involved equal female choice, isn't it likely that she would have had much to say about the original marriage? Further analysis of mating practices in primitive society raises more questions as to male choice selecting for specific traits. Murdock's worldwide sample of 250 societies (1949:263) showed that only three had a generalized sex taboo. Most of the others allowed premarital sex, extra-marital sex, wife-lending, etc., all of which could be involved in pregnancy with someone other than the social father. (Smith, 1976, p. 20)

Another way to view this is by noting that at the extremes, a society displays the highest and lowest hormonal thresholds. These thresholds exist in those with bodies and minds most impacted by the battle between physical function and behaviors, both required for survival. Those at the hormonal extremes are at the front lines of what a body can easily survive. When the environment changes, the extremes are put under more intense distress as the societal balanced polymorphism (the established balance of social structures within a society) is pushed in a specific direction. The majority of society, which exists in the center of this spectrum and which also has a heterozygote advantage (Annett, 2002), is compelled to drift left or right, matrifocal or patrifocal, over the course of several generations. Those at the margins or the extremes are under the most intense duress. Those at the extremes will exhibit specific diseases and conditions associated with their unique hormonal constellation.

> The above analysis raised the question as to what the costs of left hemisphere specialization for speech might be. The suggestion (Annett, 1978) that costs must be right hemisphere function has been supported by subsequent findings; degree of right-handedness is related to weakness of the left hand rather than strength of the right hand (Kilshaw & Annett, 1983 . . .) and strong right-handers are rare among talented groups (Annett & Kilshaw, 1982; Annett, 1985) . . . . As expected for heterozygote advantage, the highest means were found in children with R-L differences just to the right of 0 (mild dextrals) in both sexes. The costs of the rs ++ genotype seemed to include risks to verbal as well as non-verbal abilities, that is, intelligence. This prediction has been confirmed for the present sample; scores for Raven's matrices and for several tests of educational progress was significantly poorer in strong dextrals than in mild dextral, the overall trends in all cases being a decline from left to right across the R-L continuum (Annett & Manning, 1989, 1990). (Annett & Manning, 1990a, p. 512)

Even in a society characterized by only one of the four foundation social structures, one or more of the other social structures are integrally involved. Assimilated within a society are representative individuals, couples and subcultures, who act as social structure opposites to the established paradigm. In this way, these couples and subcultures also contribute to the balanced polymorphism. Though we in the West have been living in patrifocal social structures, matrifocal elements are integrated within the larger society and occupy the "left" end of the spectrum. American society displays a combination of all four social structures. Together, all four of these form a balance that is changing, particularly now.

There are a number of repercussions, or implications, of this basic model, and details are explored below. The etiologies for a number of physical and mental diseases and conditions are suggested by understanding the eight human prototypes as hormonal outliers that exist on a continuum within social structures. These societies are held in balance, creating a heterozygote advantage for individuals able to thrive in the society's unique environment. Those whose hormonal constellations exist at the center are not burdened by hormonal extremes. This model offers an engine behind human evolution that can be examined in enough detail that predictions can be made, particularly about which diseases and conditions will be associated with which social structures. This work will concentrate on autism.

Neuroscientists will recognize at the core of this thesis a variation of the Geschwind and Galaburda (1987) hypothesis that connects hormones, handedness, lateralization and debilitations. Evolutionary developmental biologists familiar with nineteenth-century principles of heterochrony will find heterochronic processes manifesting in neuropsychological studies of the endocrine system (specifically, testosterone and estrogen). These evolutionary biologists will also recognize how sex hormones influence maturation rates and timing. Anthropologists will be able to observe the impact of social structure–and the forms of sexual selection that drive social structure (such as female sexual selection and female infanticide)–on how societies transform and our species evolves.

8

Social Structure Paradigms

> The major modification this produces in the sexual selection process is in the criteria for 'best genes' in the male. The one-male group species are most like the ungulates, with, for example, greater sexual dimorphism and special anatomical features for the male (the mane and 'cape' of the hamadyras for example). The multi-male species show less sexual dimorphism and specialization, and capacities for group-living and organization are obviously being selected for rather than mere strength or endurance or display. High-ranking female groups, for example, will often not tolerate males who are too aggressive and competitive, and these leave the group and become solitaries. (Fox, 1983, p. 8)

We have our four base social structures, two matrifocal and two patrifocal. Modern societies can be hybrids. Societies can transform from one of the four constellations into another of the constellations. Hybrid societies can fluctuate dramatically in just several generations.

F TE/M te Classic Matrifocal

> In the consanguine family, thus constituted, the husbands lived in polygyny, and the wives in polyandry, which are seen to be as ancient as human society. Such a family was neither unnatural nor remarkable. It would be difficult to show any other possible beginning of the family in the primitive period. Its long continuance in a partial form among the tribes of mankind is the greater cause for surprise; for all traces of it had not disappeared among the Hawaiians at the epoch of their discovery. (Morgan, 1877, p. 409)

During that period of exponential human brain growth, hypothetically encouraged by communal rituals of dance and rhythm, bonobo-like female promiscuous sexual relations (Blount, 1990; Kano, 1992) made for female centrality to society.

> Pygmy chimpanzees [bonobo] are promiscuous. All kinds of pairings among group members are possible, except between a mother and her mature son. Consequently, members of the same sex within a group can all be sexual competitors. At the feeding site, however, interference by other mature individuals before, during, or after copulation was seen in only 33 out of 515 copulations. That is, interference during copulation occurred at the inconsequentially low rate of 7%. (Kano, 1992, p. 145)

High female testosterone accompanied by high estrogen would result in less sexual dimorphism. As a result, there would be larger, often obese, females, and these females would display authority in society. In this paradigm, females would display a tendency toward acceleration relative to males, with more adult features evidencing in the female sex. In this case, the result may be *more* synapse pruning at early ages, resulting in females first exhibiting split consciousness (two times, two places, an ability to think of something's opposite), handedness, reduced corpus callosum and cerebral lateralization. Females would precede males with modern brains.

> The evolution of modern Homo sapiens over the past 100,000 years has been marked by a trend toward increasingly craniofacial neoteny, including reduced prognathism, increased brachycephaly, and general gracilization in a number of populations. (Weidenreich 1945, Newman 1962, Brace and Mahler 1971, Frayer 1981). Biological anthropologists have generally invoked natural selection for ecological adaptation of nonadaptive forces such as pleiotropy or biased mutation to explain these trends. The analysis in this paper suggests that sexual selection may also be involved. (Jones, 1995, p. 735)

Female high estrogen encourages a heavy focus on those males that are exhibiting. High female estrogen also encourages female sexual selection, or female choice, and an intense focus on children.

> In bonobos, however, male alliances are little developed, which allows females to exert much greater influence. As a result, a relatively young adult male can reach a top position provided his mother is of high rank. On the other hand, males whose mothers are over the hill, or dead, tend to drop in rank. This brings us to perhaps the most puzzling aspect of bonobo society: females often dominate males. With a few notable exceptions, such as spotted hyenas and the lemurs of Madagascar, male dominance is the standard mammalian pattern. The reason is not hard to guess: males usually outweigh females and possess weapons, such as horns, tusks, or fangs, that are absent or much reduced in females. (De Waal & Lanting, 1997, p. 76)

Males would reveal the low testosterone, low estrogen complementary paradigm. These males would exhibit cooperative, creative compulsions to engage in ritualized behaviors, competitive insofar as a desire to perform could result in procreation opportunities. Males would tend toward narcissistic self involvement with relatively little attention assigned to children, with the exception perhaps of their sister's progeny. Primary process (one place, one time, little ability to intuit an opposite) would be the default male consciousness.

"In other words, chimpanzees are very promiscuous, but this does not mean that every female will accept every male who courts her" (Goodall, 1988, pp. 187-8).

There are additional variables that result in male language facility vs. difficulty using speech (Baker et al., 2010). I hypothesize that an important variable may be when fluctuating estrogen levels in infants impact right hemisphere synapse pruning. Left-handers (Annett, 1985), gays, some types of alcoholics (London, Kibbee & Holt, 1985), many programmers, people with Asperger's (Crow, 1995a), artists (Hassler, 1991), mathematicians, musicians (Hassler & Gupta, 1993), and architects often reveal either a stunning facility with language or frustrating deficits. The paradigm for females with high testosterone and estrogen and males with low testosterone and estrogen seems to support males evidencing both extremes. These are male facile performers but perhaps not yet lateralized for speech.

F tE/M Te Warrior Patrifocal

> In other words, given that attractiveness varies with age, individuals may be more or less attractive than others of the same age in part because they have facial proportions associated with younger or older ages. Because the retention of traits from early stages of the life cycle into later stages, relative to ancestors or to other members of the population, is known as neoteny ('holding on to youth'), the proposition above may be rephrased: given that attractiveness varies with age, neoteny may be a component of facial attractiveness. This proposition may hold with particular force for female facial attractiveness: a by-product of the human male's attraction to markers of youthful fecundity may be an attraction to adult females presenting markers of youth to an exaggerated or 'supernormal' degree. (Jones, 1995, p. 728)

This is the classic male chauvinist society, with males focused on controlling procreation by inhibiting female sexual promiscuity while intimidating male rivals. Male competition is focused on scaling hierarchy ladders and displaying in fashions that compel competitors to withdraw. Monogamy with male violations of monogamous relations and polygamous relations both apply. Males exhibit little cooperation and little reinforcement to exhibit aesthetic predilections.

> Geschwind and Levitsky (1967) reported that in 100 postmortems, a larger planum was found on the left side in 65 brains, on the right side in 11 and in the remaining 24 the two sides were about equal. Galaburda et al. (1987) looked at the actual sizes of the plana on each side in this same series. They found that in symmetrical brains, both plana were large, while in asymmetrical ones (the typical pattern) the size of the planum on the right side was reduced, while the left stayed about the same. Thus, the typical pattern of asymmetry seems to be associated with a reduction on the right side, rather than expansion on the left; and symmetrical brains show no reduction on either side. Similarly, for the right and left hands, it looks as though bias to the right hand depends on loss of left hand skill, rather than increased skill on the right. (Annett, 1991, p. 87)

It is the norm for brains to be lateralized and to be programmed for right-handedness (Annett, 2002). Although there is less facility with the left hand, the hemispheres are not competing for tongue control. Speech is established in both sexes.

Female high estrogen is not complemented by high testosterone. This additionally encourages a heavy focus on male authoritative features. Males pick females exhibiting neotenous characteristics, females likely to cooperate with the male agenda. With high estrogen, the females are intensely focused on raising children, the children of the male that has fought for her or proven to her father that he fits the criteria for a worthwhile male in the society.

Female infanticide is in evidence as girl infants are killed by mothers, thus creating fewer future wives for competing males (Mungello, 2008). Males furthest from the societal ideal achieve no procreation opportunities, reinforcing the high testosterone, low estrogen males' ability to control limited fertile outcomes. Nevertheless, with so little male cooperation and tenuous aesthetic common ground, the society is only as stable as individuals feel threatened and compelled to follow the dictates of fear and anger.

"I might add that all women get married, are married young, and stay married during their entire reproductive period, but not all men are successful in finding wives, and many only do so later in their reproductive life spans" (Chagnon, 1979, p. 97).

F te/M TE Conventional Patrifocal

> Mongoloid women accordingly tend to be more paedomorphic [neotenic] than women of other groups. Not only do women of Mongoloid origin present more prominent and rounded foreheads, but the bones of the whole skull, and, indeed, the whole skeleton, are more delicately made. Mongoloids generally tend to be shorter, and have larger heads, including larger brains–150 cc by volume greater, on the average, than Caucasoids. The face is flatter, the jaws and palate smaller, the nose smaller and flatter at the root (the miscalled 'bridge'), and the slight fold of skin over the median part of the eye (the epicanthic fold) is preserved. The body is less hirsute, and there are fetal traits . . . . The differential action of neoteny has produced some peculiar effects. For example, among the highly neotenized Japanese the males' upper and lower jaws have been reduced in size while the teeth have not. The result has created a disharmony in many males in the form of extreme crowding and malocclusion of the teeth. (Montagu, 1989, p. 40)

This is the Asian paradigm or the society that exhibits male cooperative behavior in the context of a highly hierarchical, stable, aesthetic-based society. An anomalous feature of this hormonal balance is the shift down of both testosterone and estrogen levels from the levels existing in the other three paradigms, accommodating females that are subservient to males while also accommodating males that can behave both cooperatively and subserviently to one another, depending on their hierarchical status. A net result is an extremely stable society, one that engages in common female infanticide, with aesthetic conventions that carry for extremely long periods of time.

I'm hypothesizing that in highly patrifocal hierarchical Asian societies, originally organized in ways that demanded large-scale cooperation in order to manage irrigation works spanning hundreds of miles, males need to be high in testosterone relative to females, while simultaneously being low in testosterone relative to other males. This would be necessary in order to better facilitate cooperation within a highly combative hierarchical and patrifocal society requiring male/male collaboration. A relatively high estrogen Asian male is suggested by the highly aesthetic and visually discriminating Asian culture. To fit this model, Asian females would have to exhibit the lowest recorded female estrogen levels. This would mean the normally low Conventional Patrifocal female estrogen would have to be shifted lower in order to accommodate Asian male patrifocal cooperation. And, indeed, studies support anomalously low female Asian estrogen levels (Diamond, 1986).

Males exhibiting high estrogen, even in a patrifocal society, will focus heavily on females exhibiting neotenous characteristics. At the same time, Asian males are relatively low in testosterone (Diamond, 1986), which is necessary for them to function in a highly hierarchical society with cooperative demands. The net result is societies exhibiting high levels of neoteny in *both* sexes.

Female infanticide may be integrated into an understanding of patrifocal social structure–particularly the Conventional Patrifocal social structure of hierarchical Asian social structures, which exhibit long-term stability. When the number of females in the procreation pool is reduced, far fewer males are able to have children. A heavy emphasis is placed on the ideal male, and the non-ideal males procreate far less. The result is a continuing selection of highly patrifocal traits in the male population. Because of this, older genotype features that accompany matrifocal social structure do not easily emerge. This would include left-handedness and an attraction to innovation and spontaneous creativity. Instead, status, hierarchy and tradition would be highly valued, as is the case with traditional Asian culture (Campbell, 1964). I am hypothesizing that female infanticide is a powerful sexual selection tool providing long-term stability to Conventional Patrifocal societies.

Asian societies are highly neotenous, revealing childlike, diminutive features in both sexes (Montagu, 1989). Skin will be pale and brains will be large. This is a very particular kind of neoteny, different from the Contemporary Matrifocal society's cluster of neotenous features. Asian society is reinforced by males with a highly developed aesthetic sense accompanied by an attraction to childlike features. With males featuring high estrogen in their hormonal paradigm, as opposed to low testosterone, there emerges a basket of neotenous features different from what appears in the next type, Contemporary Matrifocal.

F Te/M tE Contemporary Matrifocal

> Coren et al. (1986) extended these results to demonstrate that sinistrality is associated with maturational delays in nonclinical samples. They tested 713 females and 467 males and assessed their relative rate of physical maturation using the onset of secondary sexual characteristics, age of menarche, and relative body size as their indicators. They were able to demonstrate that delayed rates of maturation were associated with an increased incidence of left-handedness for both the males and females in their samples. (Coren & Halpern, 1991, p. 99)

Humans may have swayed back and forth between Classic Matrifocal and Warrior Patrifocal over the course of millions of years of our history, with variations from region to region and band to band. I hypothesize that Classic Matrifocal only really gave way after the African Diaspora. Asian Conventional Patrifocal societies may be fewer than five thousand years old, although extremely stable. Contemporary Matrifocal societies may have just emerged in the last thousand years, exploding in the last five generations.

The result of low testosterone, high estrogen males mating with high testosterone, low estrogen females is a paradigm encouraging authoritative females pairing with cooperative, aesthetic-respecting males. Males choose females exhibiting childlike features, while females that are attracted to cooperative males select males that like to care for children. Strong neotenous tendencies emerge in both sexes. An example is the Scandinavian paradigm where you have blond hair, blue eyes, a lanky physique and cooperative societies focused on egalitarian relationships (Geschwind & Galaburda, 1987). There is an additional propulsion in the neotenous direction set up by the need in northern latitude communities for vitamins D and A (Harris, 1985; Harris, 1990; Jablonka & Lamb, 2005). The need for vitamin D compels infant-associated light skins to absorb vitamin D when available. Lactate tolerance, prolonging the ability of infants to process milk, projects into adulthood, thus providing adults an ability to have access to vitamin A.

Low testosterone can lead to elongated legs and arms (Margulis & Sagan, 1991). The taller builds of these northern peoples may be directly related to males, and to some degree, females, exhibiting less testosterone in their ontogeny.

In an egalitarian society featuring female authority with male creativity, one would expect males to respect estrogen's compassion/aesthetics dynamics and one would expect less competition among males for hierarchical position. This Scandinavian constellation of hormonal relations, the Contemporary Matrifocal paradigm, is the social structure in ascendancy today, integral to changes in societies industrializing across the world. There will be more comments on this point later in this work.

9

How Individuals and Societies Transform

But why does recapitulation occur? Since he rejected the single developmental tendency of Naturphilosophie, Agassiz could not propose the easy explanation of his teacher Oken. As Darwin's most implacable opponent, he could seek no aid from transmutationists' doctrines. To Agassiz, the threefold parallelism reflected the unity of God's plan for His creation. It was also a fact of observation. What more need a Cuvierian empiricist say? 'The leading thought which runs through the succession of all organized beings in past ages is manifested again in new combinations, in the phases of the development of the living representatives of those different types. It exhibits everywhere the working of the same creative Mind, through all times, and upon the whole surface of the globe.' (1857, p. 115) Agassiz invoked his God specifically to forestall any evolutionary reading of recapitulation . . . . Yet, Agassiz's view contained an argument that no evolutionist could resist interpreting. If the fossil record is only a temporal display of the same divine plan that animals reflect in their own ontogeny, then the geologic component of Agassiz's threefold parallelism merely extends the scope of recapitulation and the generality of benevolent design. But if fossils record an actual history of physical descent, then the argument must be inverted. The geologic record is no mere addition to a twofold parallelism between embryonic stages and the structural gradation of living forms; it is the fundamental sequence that engenders the other two. The structural gradation of living forms is merely its artifact, because primitive animals have survived in each type. Embryonic stages are only its reflection, because an embryo must repeat the shapes of its ancestors before adding its own distinguishing features. Agassiz's parallelism, a divine union of three independent sequences, becomes the mechanical result of a single causal chain leading from the geologic record to the stages of embryology: ontogeny recapitulates phylogeny. (Gould, 1977, pp. 66-8)

We have four social structures, two patrifocal and two matrifocal. At present, we are experiencing a matrifocal surge featuring dramatic increases in individuals exhibiting the Contemporary Matrifocal hormonal constellation.

Conventional Patrifocal: Domineering, caring and discriminating men who choose cooperative women.

Warrior Patrifocal: Domineering men who choose cooperative, caring and discriminating women.

Contemporary Matrifocal: Commanding women who choose creative, cooperative, caring and discriminating men.

Classic Matrifocal: Commanding, caring and discriminating women who choose creative and cooperative men.

These four fundamental paradigms are flexile and have an ability to transform from one societal paradigm into another over time. The human hormone thresholds can vary over time and can control the speed and direction of evolution. The thresholds can be influenced at three locations within two interlocking cycles, or feedback loops, as described below.

Feedback Loop #1: Mother's testosterone level > progeny maturation rate > social structure proclivity > mother's testosterone level.

Feedback Loop #2: Mother's estrogen level > progeny maturation timing > social structure proclivity > mother's estrogen level. In addition, progeny's ability to exercise aesthetic discrimination and caring behavior is affected by mother's estrogen levels.

Whereas testosterone levels manage the brute force of maturation, the speed of maturational change, estrogen not only influences the timing of maturation rates, but through sexual selection, adjusts specific species features. In addition, evolution is directed in specific neotenous or non-neotenous directions as a direct result of the focus of estrogen on progeny and progeny features.

The environment can intervene at any of the three levels of these two loops by influencing both maturation rates (by testosterone), maturation timing (by estrogen) or by influencing the intensity of mate selection criteria (by estrogen).

Level 1: A mother's uterine hormonal levels are impacted by en-

vironmental influences, thus affecting the child's maturation and development. The hormonal levels of the mother influence the overall disposition of the social structure by predisposing certain tendencies of the progeny.

Level 2: The environment, through a variety of specific hormone-influencing prompts, impacts a person in society, thereby shifting social structure proclivities.

Level 3: Shifts in social structure influence mate selection criteria, which alter evolutionary trajectories.

Changes may occur at the level of the womb, individual ontogeny and/or at the level of society. The relationship among these three environmentally susceptible locations creates an interactive system, which directs evolutionary trajectory.

When a mother's womb testosterone and estrogen levels are changed by impacts at one of three different scales (womb, individual's lifetime, social structure), influencing her child's maturation rate and timing, the result is changes both in the individual and in the social structure or sexual societal relations that the progeny is inclined to become a part of.

Womb conditions influence the evolution of individuals and social structure. Womb environment, individual lives and social structure influence womb conditions.

Testosterone levels impacting the rate of maturation and estrogen levels controlling the timing of maturation come as a result of environmental or social structure adjustments that influence those levels of testosterone and estrogen. These environmental and social structure adjustments determine the speed, timing, features and direction of evolution.

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Central to this model are the environmental impact points, which compel the transformation of a society and our species. In a woman's womb, testosterone levels decide her children's testosterone levels (Geschwind & Galaburda, 1987) and hypothetically their maturation rates and social structure proclivity. Females (F) with high testosterone (T) give birth to high testosterone (T) females and low testosterone (t) males (Geschwind & Galaburda, 1987). F T = F T or M t. The reverse is true for low testosterone females. Low testosterone females give birth to low testosterone females and high testosterone males (Geschwind & Galaburda, 1987). F t = F t or M T. *I hypothesize that this is how societal prototypes are created and maintained.*

As noted, neoteny refers to the prolonging of infant features over many generations so that eventually they appear in the adults of the descendants. For example, chimpanzee-like progenitor features, such as having a large head relative to body size, small chin, large eyes, upward stature (Cope, 1877; Montagu, 1989), curiosity (Robbins, 1980) and affection, are all characteristics that over time manifest in the physiology and psychology of adults. Acceleration reverses the evolutionary trajectory, whereby processes featured by ancestor adults withdraw over time and appear earlier in development in the characteristics of children as well as in the infants of future descendants (Gould, 1977).

Heterochronic dynamics of evolution (i.e., neoteny and acceleration) are embedded in social structure and lead to the very specific mating of neotenous males with accelerated females in matrifocal social structures and lead to accelerated males marrying neotenous females in patrifocal social structures. *There is a direct connection among womb conditions, maturation rate directions (neoteny and acceleration) and social structure.*

The net result is not only that males and females are mating with their hormonal complementary opposites, but also that societies are evolving with males and females trending evolutionarily in opposite directions by continuing selection for opposite proclivities in opposite sexes.

The Mars/Venus polarity explored in popular culture (Gray, 1992) has its roots in this complementary opposite maturational trajectory.

Whereas the influence of a mother's testosterone levels on her progeny has been established (Geschwind & Galaburda, 1987), this model hypothesizes that the mother's estrogen levels influence her children via an identical dynamic, which encourages and reinforces the sexually selected focus on partner choice and discrimination, as well as caring and caregiving. In addition, estrogen levels hypothetically inform the

timing of maturation rates, adjusting testosterone surges and informing synapse pruning. In this case, I hypothesize that the estrogen levels within a woman's womb determine her children's estrogen levels, their tendencies toward evaluation of nuance and their compulsion to care. It is also possible that estrogen levels control synapse pruning, thus influencing degrees of cerebral lateralization or anomalous dominance (Saugstad, 1989), degrees of self-awareness, theory of mind (Baron-Cohen, 1995; Tomasello, 2008; Hrdy, 2009), or what I call split consciousness. I hypothesize that a female (F) with high estrogen (E) gives birth to high estrogen (E) females and low estrogen (e) males. F E = F E or M e. I suggest that the reverse is true for low estrogen females. F e = F e or M E. This is how estrogen-related societal prototypes are created and maintained. This dynamic also contributes to the complementary opposite foundation of this thesis.

If, indeed, estrogen levels in early childhood determine degrees of cerebral synapse pruning, thus influencing cerebral lateralization, not unlike how low estrogen at puberty can prolong brain growth for months or years, then not only is this a model for understanding differences between precultural and contemporary humans, but it offers also an opportunity for understanding degrees of theory of mind, or self-awareness, in current times.

Estrogen managing the timing of synapse pruning may have been central to both the emergence of split consciousness thousands of generations ago and the surge in autism today.

Whether a male or female has high or low estrogen levels does not contribute to maturation rates (though the estrogen level does contribute to maturation timing). This makes it possible to have high or low estrogen males and females in any social structure. Maturation rates inform heterochronic tendencies and social structure proclivities. Nevertheless, estrogen confers discrimination, an attention to detail that can exaggerate the proclivity of a social structure. In addition, estrogen focuses on the features of a child, attracting those with high estrogen toward individuals who exhibit childlike features.

Assign high estrogen to a female with high testosterone and the result is Classic Matrifocal social structure with commanding females prone to choosing cooperative males with neotenous, or child-like,

characteristics. Assign high estrogen to a male and the result is either a Scandinavian Contemporary Matrifocal paradigm (Eisler, 2007), with both sexes exhibiting neoteny in a matrifocal context, or the result is an Asian Conventional Patrifocal paradigm, with males who are focused on mating with females displaying highly neotenous features. When pairing high estrogen with high testosterone, the result is an exaggerated intensity of sexual selection, not unlike Fisher's runaway sexual selection (Fisher, 1930), which results in a powerful focus on neoteny. F TE = Matrifocal selection for neotenous males. M TE = Patrifocal selection for neotenous females.

The particular way that testosterone and estrogen align with individuals within a society compels both social structure and particular physical features of individuals. These two hormones, which influence heterochronic trajectories, also influence personality features, disease and condition proclivities, societal characteristics and even such societal mysteries as female infanticide.

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Chutes and Ladders

> In the chimpanzee, several males mate frequently with the oestroud females, so that each male has to deposit enough sperm to compete with the presence of sperm from other males. For the chimpanzee, therefore, we hypothesize that selection will favor the male that can deposit the largest number of sperm; thus the volume of spermatogenic tissue and hence the testis size is far greater in the chimpanzee than in the gorilla or orangutan. If this is correct, it implies that primates in which more than one male mates with each oestrous female should have larger testes relative to their body weight than those with single-male breeding systems. We have tested this prediction across a wide range of primates, and the results support the hypothesis. The relative size of testes may, therefore, provide a valuable clue to the breeding system of a primate species. (Harcourt, Harvey, Larson & Short, 1981, p. 55)

Integral to an understanding of how humans are evolving is recognizing the many variables that influence social structure. Sexual selective forces inform social structure, and environmental effects influence hormonal levels that influence social structure. Insisting that natural selection is the cause of our evolution is a little like watching the railway tracks to guess what kind of locomotive will be passing by. Of course, any social structure-related evolutionary development has to pass the test of progeny surviving to procreate. That railroad they have to travel. What exactly passes down those tracks has much to do with selective forces related to society and the environment; it is far more complicated than mere survival. The train is not the tracks.

My favorite game when I was small was Chutes and Ladders. I think I was as powerfully moved by the game board imagery as I was by the dynamic of the game. The player could observe at any time during

the game the potential pathways that the game could take. Playing the game was to act out the manifest ups and downs characteristic of this chunk of life.

This theory of evolution offers two evolutionary trajectories with matrifocal and patrifocal social structures, with each social structure enhancing or compelling a specific evolutionary direction. As in Chutes and Ladders, human procreative bodies (bands, tribes, societies) work their way across the game board, wiggling one way and then the other as they pass through time.

Matrifocal bands or tribes exhibit commanding, often domineering, females mating with cooperative males seeking to please. This is the bonobo paradigm (De Waal & Lanting, 1997). These are highly sexualized societies with progeny not knowing who the father is. Descent is matrilineal. Describing human matrifocal evolution, also described as matrilineal/matrilocal evolution (Thompson, 1981), one can hypothesize a number of additional features, including male exhibition, runaway sexual selection, dance, song, rhythm and the dynamics of neoteny growing brains.

> The hypothesis advanced in this paper suggests that commencing with a single hominid ancestral population, which has subsequently separated into several geographically isolated populations, that in addition to such factors as mutation, natural selection, isolation, drift, and the like, neotenous mutations have played an important role in adding to the quanta of morphological difference among such populations. Neotenous mutations occurring at a more rapid rate in some early populations than in others would, at least in part, be responsible for the development of morphologically modern-like types of man at a period contemporary with the flourishing of such types of Pithecanthropus, Heidelberg, and Solo man. The hypothesis suggests that in the latter types neotenous mutations occurred comparatively infrequently. (Montagu, 1955, p. 27)

Patrifocal bands or tribes feature cooperative, often docile, females mating with commanding, hierarchically-inclined, status-seeking males. A dominant male or group of males often controls access to fertile females. Often, the father can be fairly easily discerned.

As in Chutes and Ladders, a band can sometimes be matrifocal, at other times patrifocal, climbing or sliding its way across the game board. These transitions don't usually occur quickly, but they can.

> Another kind of turnover-pulse hypothesis has been articulated by Calvin (1991), who emphasizes the possible role of glaciation cycles in facilitating human evolution. Until recently, Pleistocene glaciation was assumed to affect primarily upper latitudes, but recent paleoclimatology studies have suggested that glaciation had substantial effects on the temperature, rainfall, seasonality, and patchiness of resources in the equatorial zones of Africa (Foley, 1987). So there is a coincidence between the onset of glaciation cycles and the onset of encephalization in our lineage. (Miller, 1994, p. 28)

A band or society can oscillate between social structures as they are impacted by surrounding societies, the environment, intramale competition, access to resources, female infanticide, immigration and cultural innovations.

The result of these various impacts drives evolution. In a matrifocal society, cooperative, neotenous, low testosterone males are highly valued along with commanding, high testosterone females. Two trajectories are established, yanking in opposite directions. In humans, this specific dynamic was encouraged by runaway sexual selection, resulting in exponential brain growth as that embryo and infant feature–rampant brain growth–prolonged itself into later and later ontogenetic stages.

Patrifocal societies select for neoteny in cooperative, low testosterone females, and neoteny's opposite, acceleration, in commanding, high testosterone males. Here there is still a demand for neoteny, but there is no runaway sexual selection (Fisher, 1930) driven by female choice. Neoteny in females does not drag both sexes and society into larger brains because males are choosing females, and their mate criteria are less ambitious than a female's. High testosterone men just want babies.

On one hand, the chutes, for example, you get quickly advancing neurological, physiological and hormonal change following a bigger brain trajectory that is horizontal and matrifocal. The ladders reveal hierarchical, male-dominant, patrifocal society (Kropotkin, 1902).

These societies are more stationary and tend to exhibit an evolutionary status quo.

If females aren't choosing, the dynamic tends to be about marshalling resources, achieving status, manifesting control. These features can drive biological and social evolution. But it's less about creativity, the hallmark of matrifocal culture, and more about domination.

Competition among males in patrifocal society can create extreme physiological features, sexual dimorphism and a larger male relative to female size. A changing environment may compel a society to exhibit specific male-dominance patrifocal traits if those traits are suitable for the new milieu. In humans, if competition among males becomes fierce, female infanticide becomes highly valued so that males without keen competitiveness find no mates.

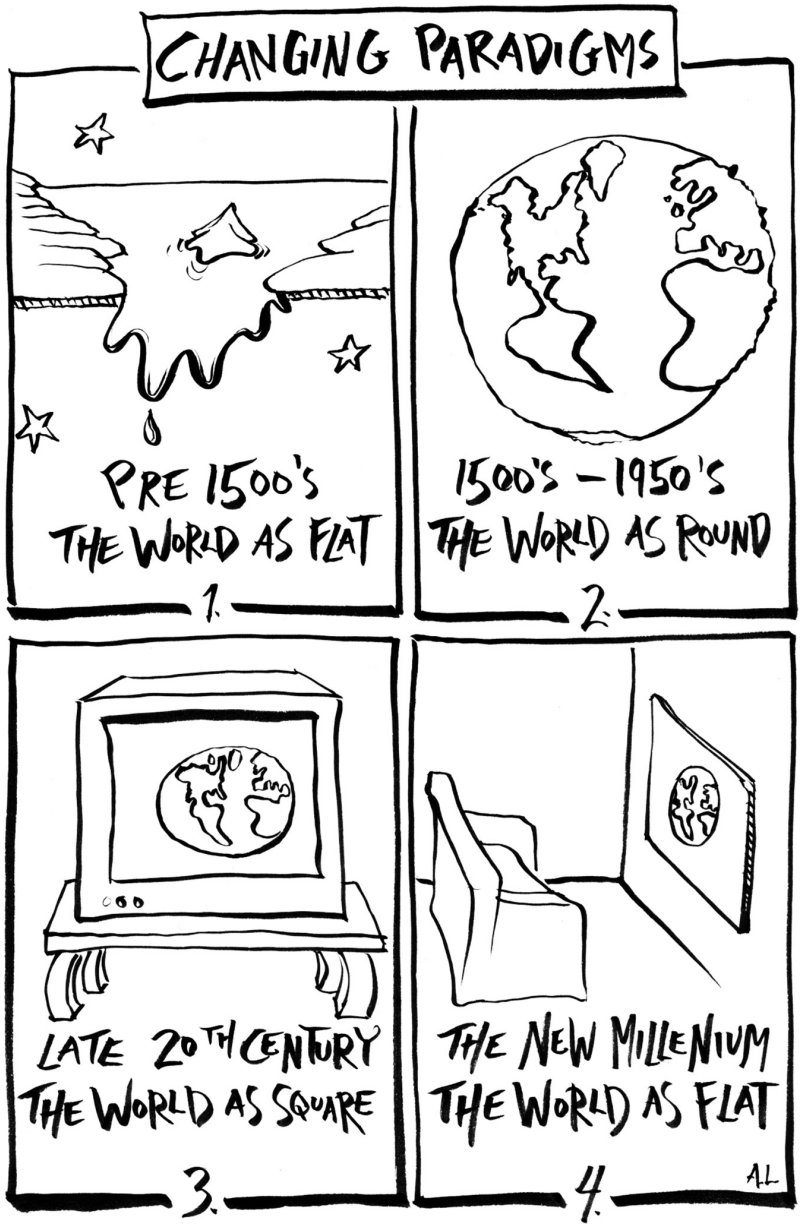
If a warrior people begin impacting a gentle folk, the gentle matrifocals might feel compelled to kill their female infants to quickly reduce the number of males procreating, particularly males that could produce cooperative, rather than commanding, adults, who could end the tribe. In less than a handful of generations, a society might reverse direction to climbing ladders rather than taking slides.

The reverse can occur. A large and established matrifocal culture might compel a smaller patrifocal society to relax. If patrifocal females can exhibit choice, male domination will quickly wane. A patrifocal female, provided models, might choose a male that would enhance her life, not dominate it. These males are often innovators, not dominators. We can trace the emergence of matrifocal cultures over the course of history by noting surges of innovation within a society. Where there is innovation, there is female choice.

America, the nation of immigrants, exhibits exponential innovation in large part due to the complete breakdown of sexual selection criteria. There is no perfect mate. The patrifocal dominance model has become increasingly eroded as females choose mates according to their own criteria based on their experience and observations of the many ways other women choose mates.

In a human band, tribe, society, or mega-society like the U.S., all cooperate with the demands of hormonal-driven social structure, sliding and climbing their way across the generations. Whereas the advocates

of natural selection would prefer that our path be clearly defined by a railway-like, straight and narrow, long-term direction, I would suggest adjusting the metaphor. Even today there are still left on the railways seesaw-like rail cars, two-person units, which allow one person to pump down on one side as the other person lifts up. While one person stands, the other crouches, as they up and down each other along the tracks. Indeed, natural selection is the foundation that we move upon. But getting from one place to another involves far more than whether we survive to procreate. In this model, males and females drive evolution by establishing complementary opposites, positions that both reinforce established social structure and maintain flexibility to adjust to environmental circumstance.



III Current Society: The Players

11

Orchestral Theory and Contemporary Times

> From Neolithic villages to organized state, from gardening to irrigation farming, from inconography to writing, from disorganized raids to institutionalized warfare, from custom to law, from matriarchal religious authority to patriarchal political power, from mystery to history; the transformation was so complete that the past itself was reinvented to create a new foundation for a radically altered present. Now that we ourselves are moving into a radically altered present, it is small wonder that the patriarchal image of prehistory is disintegrating. The movement into the future always involves the revisioning of the past. (Thompson, 1981, p. 208)

Some historians of culture have hypothesized that the great flood stories surfacing as early as the Sumerian Gilgamesh epic and later in the Old Testament are the written traces left from thousands of years of oral traditions describing an actual event (Heidel, 1946). The event would be the creation of the Black Sea, when the Mediterranean broke through the Bosporus and created in a geologic nanosecond a huge, new body of water. That geologic moment has been estimated to have lasted perhaps two years, the time it took to fill a basin formerly populated by thriving, land-based ecosystems and, so the story goes, human beings.

Radio and television, democratizing forces now controlled by corporations, offered an experience of the commons. Though these were one-to-many communications, content often served the many instead of the few. There was a shift as the few successfully guided the message of media to be about how profits could be best achieved (Trippi, 2004).

Radio and television learned to encourage a common frame of

reference–a personality-based consumer culture–that offered none of the experience of the commons. Producer/advertiser and consumer formed an exhibition/evaluation feedback loop, not unlike the dynamics of runaway sexual selection. Producers/advertisers created mountains of consumables as consumers exercised discrimination in choosing amongst what seemed like an infinite display of alternatives.

For almost three generations, American personal empowerment has been about our ability to make choices among the many alternatives we're being offered to consume. We've developed a highly refined sensitivity to nuance and a culture able to serve up content for our craving to materially embrace what is offered. Allowing the corporations the power to mediate the experience has been easy for us because corporations have been so responsive to our signaled desires, yet they've controlled the commons. They have controlled the conduits through which communication or information travels.

In just the way that the waters broke through the Bosporus, a commons has come crashing into our consumer culture, interrupting the relationship between producer and individual. Whereas until recently we felt empowered by all the consumables we perceived we were being offered, other kinds of choices are now emerging. The Internet is suggesting a different kind of relationship. Experiencing many-to-many communications, we are having experiences not characteristic of profit-driven, one-to-many communications. We are discovering that there are deeply rewarding features of the commons.

A dam is breaking. Such a geologic nanosecond is the time in which we live. Except, instead of destruction, new territories are being uncovered and explored. Populating spectrum, occupying bandwidth obliterates no species, murders no aboriginals. We bring with us no diseases that cut down civilizations that have no written language. Nevertheless, this is an age of exploration with staggering ramifications for our species and the world.

A new Black Sea is forming, but this time it's an ocean, with no clear limits to its reach. Millions of trained, highly discriminating, former consumers are being empowered by an ability to (1) create and control content in their own communications; (2) find unique content that wasn't created specifically to sell to a large number of people; (3)

form evaluations unrelated to purchases; and (4) have an experience of feeling mirrored by other individuals, not a message on a screen.

This is a space not controlled by family, church, school, corporations or government. It is the commons. It might also be called the aesthetic economy, the steward economy or an economy driven by matrifocal neotenous dynamics. It is an economy where participants can play.

> Between 1960 and 1983 the number of working women doubled. Between 1966 and 1976 the divorce rate doubled too. And in 1981 remarriage rates hit a modern high. After many centuries of permanent monogamy among our farmer forebears, the primitive human pattern of marriage, divorce, and remarriage had emerged again. (Fisher, 1992, p. 296)

Runaway sexual selection (Fisher, 1930) serves well as an explanatory principle revealing the origins of humans. Tying runaway sexual selection to social structure suggests that these same principles may apply to how a consumer society emerges and transforms, a transformation tied to matrifocal themes.

Runaway sexual selection (Fisher, 1930) is closely associated with females picking males as males compete to achieve procreation opportunities, females becoming encouraged by that process to become more discriminating as genes for both sides of the process get carried forward. Over the course of the twentieth century, we've seen a dramatic return to matrifocal social structure in the West with woman's suffrage, the adoption of the Pill, women's rights, legalized abortion, more women in the workplace, women in academics, women having children later, child care, etc. The ideal man has changed, too. Macho is out.

Women are choosing men that potentially provide them a life characterized by their feeling loved, strong and secure. Men are being chosen for qualities not highly valued in the West until recently. In addition to being providers, the men need to be cooperative, attentive and good with kids.

Not unlike the last time around, runaway female sexual selection has been engaged. Only this time, it's not females picking males because they're good dancers; it's females picking products that they are drawn to and males picking products that they feel females will be

drawn to. The runaway consumer economy is a direct manifestation of a return to a matrifocal society, only the unique productions of culture have become the focus of our attentions.

Female and male consumers have become consumed by the dance of exercising choice amongst an avalanche of products provided by corporations specializing in creating, producing, advertising and dispensing whatever a consumer might delight in. Instead of dancing, we adorn. We drape our lives in products.

We discriminate without discrimination.

Corporations maniacally provide.

Upon first observation, it would seem that the runaway sexual selection feedback loop would be between consumers on one end and corporations on the other. Indeed, sensitivity to nuance on the consumer side encourages a proliferation of products on the other side that further encourages focus on specifics. This is the overt manifestation of an extremely sudden resurgence of female choice in a matrifocal social structure, with males struggling to compete with one another to display to females that they, too, are sensitive to nuance.

And so it ends.

During this period, we've seen blended qualities of both patrifocal and matrifocal frames of reference. We've been living in a hybrid society. In patrifocal societies, males control female procreation, seek dominance over competitors, collect stuff to ensure survival and pass it down to sons. Controlling, collecting and staying on top are features exhibited by the established powers in our society, those fittest that have survived in a patrifocal frame of reference. It is they that have been urging that we can't have enough stuff. Their time is ending.

With the return of the female paradigm, there will be an inevitable collapsing of hierarchy and an end to a consumer economy. It has already begun. If given the choice and time, females will choose beauty over stuff. The men that get chosen as partners will be the men than intuit a woman's aesthetic and satisfy. We're on the road to bigger brains, once again.

The commons that is emerging features many traits associated with matrifocal society. Indeed, this is a matrifocal surge. This new frame of reference features at its core transparency, diversity and horizontal

communication. These are modern ways of expressing the roots of the movement, ancient aboriginal matrifocal understandings, the ways that infants and the young experience the world. There are particular groups in society that represent this new zeitgeist. These are the female, the young, the artists, ethnic minorities, the poor, the political Left, gays, lesbians and the autistic. They are the sources of much of society's creativity. They are least invested in the status quo.

Societal neoteny evidences surges of creativity both from the young and from the disenfranchised. Those closest to being aboriginal, those in poverty, the artists and the fringe–those furthest from the conventional center–are sources of the creative impulse, that which is newest that can prolong its way up the social tiers, flattening as it goes.

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Neoteny is a biological principle whereby changes in the rate and timing of maturation of individuals over time, generation to generation, influence the evolutionary trajectory of a species when the characteristics of infants or features of early ontogeny are prolonged to appear later in ontogeny or in the adults of descendants (Gould, 1977). Draw the features of babies into older and older stages over time and you are neotenizing that ancestral chain. Pubertal timing is also an issue. For example, in humans, if you change the diet of children and encourage puberty to come later (Badcock, 1991), you will often have adults with brains with more synapses (Saugstad, 1989). The testosterone surges of puberty cut off brain growth (Saugstad, 1989).

Neoteny is central to biological evolution and integral to understanding human beings. To understand the repercussions of this process, it is necessary to realize that the moment when an individual's maturation rate is determined, just weeks before birth and based upon the mother's testosterone level, is also the moment that decides that individual's position in the way that society is structured. Maturation rate, determined in the mother's womb, propels the child in a matrifocal or patrifocal social structure direction. High testosterone males mate with low testosterone females, and high testosterone females mate

with low testosterone males. Understanding evolution without understanding social structure and its relationship to hormone levels and how hormone levels are determined is like trying to understand the joy of swimming while taking a bath or appreciating Bach played on a kazoo.

Biological evolution unfolds by working its way through that moment several weeks before birth, pushing and pulling individuals back and forth between hormonal extremes over generations, back and forth through social structures, back and forth through robust and gracile physical manifestations of maturational delay and acceleration patterns. In the same way, the evolutionary principle of neoteny also influences societal transformations, compelling society to evolve through a succession of stages, propelled by the prolongation of earlier stages of societal ontogeny into older stages over time.

There is evidence to suggest that we were highly matrifocal up to and past our leaving Africa (Thompson, 1981). The diminution of brain size around 25,000 years ago (Wiercinski, 1979) suggests that a transition to a patrifocal orientation was underway. Patriarchy galloped out of Southern Russia 6,500 years ago and quickly converted old Europe, India and China (Gimbutas, 1974). Right now, we are in the midst of a synthesis of matrifocal and patrifocal paradigms. From this position, we can observe surges of neoteny moving up through cultures as the neotenous characteristics of earlier stages of our societal ontogeny stream into and through contemporary society.

There are the physical features of our chimpanzee-like progenitors that have prolonged into the adult human of today, such as large brain, small jaw, big eyes, walking on hind legs, location of foramen magnum, etc. (Montagu, 1989), and there are the nonphysical features, such as propensity to play, creativity, alertness to that which is different, curiosity, etc.. Features of certain groups–women, many aboriginal ancient cultures still existing today, the young people in society, the poorest in society, the least empowered, the ethnic minorities, the political Left (representing the disempowered), homosexuals and the artists–have been slowly, over thousands of years, been prolonging their way into societies controlled by ruling elites, a world featuring primarily male maturational acceleration. This slow process over the last 300 years has accelerated to the point that right now it's become lightning fast.

Understanding females is integral to understanding the future. Empowering woman empowers everyone on the planet. Exploring our matrifocal past provides a window into our global future.

Aboriginals bring land-based spiritual integrity and an intuitive familiarity with the natural balance between independence and interdependence. Neoteny is characterized by close proximity to creative sources. Aboriginal cultures offer an understanding of this frame.

The young bring a form of deep curiosity and confidence that what they imagine can become true. The young are often fearless. The young crave fun. Curiosity is a prime feature of neoteny, and imagination is most powerful when acculturation has not been fully engaged.

The poor and the most disempowered bring a dependency on the culture at large, and although at first glimpse this dependency seems like a deficit, from neoteny's perspective, dependence provides a compulsion to be connected. This compulsion is mingled with intense creativity as the powerless generate art to express their relationship with the connection/disconnection polarity. As a result, they generate music, song, dance, fashion and unique athletic productions that speak for society as a whole.

Ethnic minorities often draw sustenance and inspiration from their former and present experience of poverty and a relatively close proximity to aboriginal or tribal institutions. These wellsprings of inspiration are characteristic of the sources of neoteny: creativity, sense-based spiritual revelation, deep respect for the physical and reverence for rhythm.

The political Left articulates the frustrations and the goals of neoteny's children, helping to make it possible that the present-time orientation of the aboriginal, the young, the poor and the ethnic minorities be charted into a future that integrates their orientations, strengths and needs. The gay movement is also integral to this surge.

The artist or creator, along with the child, is neoteny's mascot. To empower the creative is to bridge the essence of the child into society. Political empowerment is creative empowerment. Political repression is creative repression. To create is a political statement.

The nascent creativity characteristic of all these groups is now bursting into visibility, supercharged by the appearance of the web.

12

Female Choice and Societal Innovation

> The Paleolithic remains of female figurines, red ocher in burials, and vagina-shaped cowrie shells appear to be early manifestations of what was later to develop into a complex religion centering on the worship of a Mother Goddess as the source of regeneratrix of all forms of life. (Eisler, 1987, p. 6)

As mentioned above, between 1960 and 1983 there was a huge increase in working women, divorce and remarriage (Fisher, 1992). The permanent monogamy that had lasted for centuries among our agricultural-based ancestors gave way to the primitive pattern of marriage, divorce and remarriage (Fisher, 1992).

In Asian cultures characterized by patrifocal frames of reference, with female infanticide and now female foeticide, ancient hierarchies, deep allegiance to status and a reverence for the warrior, there is little innovation because males are selected for their ability to command and dominate. Creativity is highly valued in the context of supporting an established, conventional, ritualized aesthetic.

Across Asia into India and the Middle East, females exhibit little choice in mate selection. Families, often the father, still decide which males are suitable for their daughters. These societies are often militaristic, caste-based, hierarchical and highly stratified, featuring domineering males. Women's rights are few and neglected.

Perhaps the first society featuring an integration of matrifocal and patrifocal forces was ancient Greece. Indo-Europeans were not normally disposed to providing the matrifocal peoples that they conquered much influence in the societies that followed. Ancient Greece was an exception to a degree. Females could not vote but could sometimes wield authority, particularly in their choice of a mate. When females are provided the ability to choose, several things happen. Females choose

mates that they estimate will enhance their lives, a male that exhibits some flexibility. Males are forced to compete for the female's attention. Creative and cooperative males become valued.

Societies providing for female choice are societies that also value male creativity, innovation and flexibility. Female choice and innovation go together. Societies that view women as the property of males shut down the engine of innovation because males featuring an ability to dominate are the males that the society highly values.

Our consumer economy, driven by females choosing products for themselves and their family, has been central to the transitional three generations bridging our hierarchical, male-dominated, patrifocal past to the horizontal, matrifocal partnership society we are embracing. Females are choosing once again, with males cooperating with the new gestalt. How we choose our mate is the single most important, culture-informing decision we can make. Literally everything else in society is impacted by that decision. As the power to choose is returned to the female, we are witnessing the neotenization of society as aboriginal, matrifocal values emerge in contemporary times.

Observe the emergence of innovation in a society and you will find women that have been provided choice. They say necessity is the mother of invention. Not so. Mothers are the mother of invention. It is the female that determines the character of a society.

Put power in the hands of a man and you get stagnation. Empower a woman and you encourage the empowering of all.

~

> And so it appears that we may safely assert that whether in the early Greek and Celtic, or in the later Roman and Germanic zones, the European neolithic heritage produced largely homologous mythic forms, derived from and representing the old order of the great Age of the Goddess: and it was on this basic stratum that the later layerings of high culture myth were superimposed. (Campbell, 1964, p. 477)

After the 60s, when more female academics began achieving tenure,

a nonmale-centric view of human evolution began to form. Female observers of female behavior began to come to conclusions different from those of their white, male colleagues. Women theorists hypothesized ancestral serial monogamy based on the time (2.5-4 years) it takes to wean a child, female control of band foraging patterns, invention of language by females and the choosing by females of cooperative mates, thus encouraging noncombative social environments as a foundation for human evolution.

A female biologist (Strassmann, 1981) hypothesized that in human beings, estrus, or ovulation, grew hidden as women evolved to control their own procreation opportunities. Men wouldn't determine when to mate based on their observation of when a woman was fertile. The women would decide.

And so began a process that is coming to fruition only now, these last three generations, perhaps hundreds of thousands of years after women learned to hide the best time to have a baby.

It is believed that there are traditions that have carried through this stretch of time. Remnants of red and ochre coloring are some of the oldest signs of human culture being found in close proximity to early digs. It has been hypothesized that a tribe's women would decorate themselves with the red coloring, noting menstruation and emphasizing it was not the time for sex (Knight, 1991). Lipstick today may reveal the tail end of a very long tradition whose origins had everything to do with guarding the actual time a woman is fertile, placing choice within a woman's control. Women take off their lipstick to make love.

Tribal tradition growing to revolve around female control of procreation is suggested by several factors. Women living together commonly cycle together (McClintock, 1971). Women often cycle to the moon (Knight, 1991) with the 29.5 day lunar month often identical to the female's month (McClintock, 1971). Hidden ovulation (Strassmann, 1981) encourages a tribal culture that uses moon cycles as a signal for communal sex, putting women at the center of revolving and evolving lives.

It has been estimated that those cycles got shattered with the emergence of stationary agriculture and a shift to a patrifocal orientation (Knight, 1991). The advent of the Indo-Europeans 6,500 years ago further depreciated the female point of view. With resources to pro-

tect, males wanted to make sure that those resources were passed on to progeny with their own genetics. With time, male control of female procreation picked up speed.

Until now.

Much is made of the 60s failing so many of our expectations. Though there has been progress in the area of civil rights, women's rights, gay rights and the environment, American patrifocal forces continue to wreak havoc in this country and across the world. Yet, where it matters most, we seem to notice least. Males are giving up control.

It began in the bushes and now ends in the bedroom. Full circle, the strong, united females have returned. An appreciation of relationship and awareness of interconnection inform an understanding reborn in the 60s with the pill, LSD, disgust with war and sensitivity to a global point of view. Indeed, this was preceded by laws allowing women to inherit property and vote. But when women could control procreation with the Pill and abortion, a tidal wave of change emerged.

Culture now has a firm foundation to move quickly forward. It is in the arms and the firm grasp of a woman that our society is returning home.

13

Youth

> Electronic entertainment media reveal human neophilia particularly clearly because they act as perceptual and cognitive 'super-stimuli.' The careful selection and professional training of entertainers, writers, and directors, combined with systems of electronic editing, amplification, and mass distribution, allow the contemporary human to experience protean courtship displays (e.g., art, music, dance, storytelling) that are much more intensified, polished, and numerous than anything that would have been possible a hundred years ago, much less a thousand, or a hundred thousand years ago. (Miller, 1994, p. 387)

Kids have been experimenting with transitioning away from a consumer economy for a decade. An automobile is no longer the symbol of new adult independence. The cell phone and the laptop have stepped in. The music industry is imploding as young people exercise their ability to make their own choices. The emphasis is not on having and consuming but on choosing.

We are entering the choice economy. We display who we are by the choices we make and the relationships we establish. It's no longer about keeping up with the Joneses. It's become about exhibiting how we are unique from the Joneses.

Advertisers seek desperately for venues they can control. Young people are deriving entertainment from YouTube, My Space, Facebook, Flickr, Stumbleupon, Digg, Delicious, Reddit, Twitter referrals, websites and their friends. Music has splintered into a hundred subthemes, dragging fashion out of the hands of the corporations.

We're training ourselves and one another to exercise discernment. Focusing on unique, we are letting go of what is the same.

As a species, we are in the process of making the transition to a form of consciousness that features a far higher number of interconnections in space and time than has been the case before the emergence of the social networking technologies. Observing the ways the young are using the new technologies and how they encourage the invention of even newer technologies that enhance the destruction of traditional ideas of space and time, I conclude that we are deep into a social/biological transition.

Our world is becoming characterized by massive interconnection among individuals, each a hub in a universe of incoming and outgoing information. To some degree, this mitigates the destructive capabilities of the split-brain, split-time human. We are each becoming experts in consultation with an increasing capacity to embrace the connotations of extended relationship. We are developing an intuition or understanding that our ability to split time can create unintended consequences. Society is technologically and socially addressing the destruction we have wrought.

~

The revolution has been going on for some time now. It's moving from the bottom up. As is usually the case, it begins with the young.

One of the most powerful characteristics of newborns and new beings steeped in the matrix of creativity and play is narcissism. This narcissism often masks the presence of the creative. This masking is particularly true when evident in adults, because we tend to pay less attention to the seeming selfishness of those lost in experiences of satisfactory self-indulgence that accompany flights of creative fancy. There are ways that this narcissism protects or shields the individual from societal intervention. It allows the creator to reject society and just create.

New technologies, such as almost seamless cell phone communications, innovations on the web, social networking, sharing of music and other files and the integration of our digital lives with our friendships are encouraging a creative revolution. Masking that revolution is the obvious evidence of narcissism that suggests to the culture that these

are indulgences, and not important. The backs of our young may be turned to us now, but that is ending as we speak.

In the way that the relatively large brains of our genetic forebear babies have blossomed into modern times, the creativity of early childhood is now exploding into our youth. The selfishness we've perceived in our young people is but a leaf casing now withdrawing to reveal the flowering of societal transformation. Arthur C. Clarke's *Childhood's End* (1953) is the classic parable for this process. Except, the future is not arriving in spaceships. The future is emerging in communications technologies. Maturationally delayed males, maturationally accelerated females, including the autistic and those with Asperger's, are arriving in ever increasing numbers.

Watching how the kids communicate, we can see the future now. Democracy will be transformed into an immediate experience as technology-enhanced personal empowerment compels involvement by all adults (Rheingold, 2002). Political change will be fun. Transparency will become a given. Corporations and governments thriving on secrecy, hierarchy and segregated operations will wither as massive synergies flow in the direction of communications habits that are transparent, horizontal and diverse.

News now tells us we are separate. News now won't tell us the relationship between cause and effect. And so, mainstream media are dying. As new news reflects and suggests the ways that the world is connected, those new news sources will become revered.

Pay attention to the most annoying aspects of youth culture, where narcissism sits. Note the appearance of audacities and astonishments we never could have considered or imagined. Estimate the influence on the culture of this, this that is brand new. Realize the revolution is underway.

14

Creativity and People of Color

It is likely that, on the average, populations will differ in brain development, structure, and metabolism and therefore in lateralization patterns. Some brain diseases show marked ethnic variation; for example, Tay-Sachs disease and dystonia musculorum deformans occur predominantly in some Jewish populations. In northern Europe there is generally a higher frequency of twinning and of neural tube defects than in southern Europe and the Orient. Since twinning is associated with lefthandedness in whites, one might speculate that lefthandedness was less common in southern Europe and Japan and that therefore dyslexia and other learning disorders might be less frequent. There is a high rate of lefthandedness and of twinning in the parents of children with neural tube defects (Fraser, Czeizel, and Hanson 1982; Lemarec et al. 1978). The line of reasoning suggests that West Africa would have a very high rate of lefthandedness, learning disorders, and possibly neural tube defects, since this area has by far the highest reported twinning rates. There is evidence compatible with at least parts of this hypothesis. Stuttering is very common among schoolchildren in West Africa, rates often being three times those found in the United States (Goodall and Brobby 1982). Blacks in the United States, mostly of West African origin, have higher stuttering rates than Caucasians. The hypothesis advanced to explain the West African data was the high prevalence of sickle-cell disease. An alternative interpretation is that in West Africa there is a high frequency of anomalous dominance and therefore of learning disorders, lefthandedness, and the other attendant talents and disabilities. The very few studies of handedness in Africa have shown very low apparent rates of lefthandedness, but it is not clear whether powerful cultural biases might be present. The discussion of ethnic differences in handedness thus rests at present on mere fragments of information. It should be pointed out, however, that the distinctions so far presented are not between the conventional Caucasian, Black, and Oriental groups. Thus, the blond-haired, blue-eyed, and fair-skinned northern Europeans might resemble West African Blacks, whereas the Japanese might bear close resemblances to southern European Caucasians . . . . (Geschwind & Galaburda, 1987, pp. 145-6)

In the United States, we hold societal allegiance to the concept of independence with a reverence for the entrepreneur. We carry a unifying belief that each hero walks a separate path. We express confidence that the individual reigns supreme.

We all fervently believe each person should act upon his or her own unique beliefs.

Different authors and theorists have written on how they think this unique paradigm emerged. Robert Pirsig (1991) suggests that American colonists unconsciously embraced indigenous aboriginal character traits, which looked like self-confident, autonomous competence. I will suggest shortly that the youngest sons and daughters were impacted by the influence of old world primogenitor laws. These landless immigrants were encouraged to congregate in the New World.

There is a paradox that lies at the foundation of what it is to be American that connects to a paradox regarding the youngest son and daughter and the bridge between the youngest children and aboriginal societies.

It can all be summed up in rock ‘n’ roll.

In the early 1960s, with the emergence of undisguised African aboriginal rhythms in modern music, after several decades of their exploration in jazz, we as a society experienced a neotenization of older societal archetypes into contemporary society, not unlike the biological principle of neoteny where the infant features of our chimpanzee-like forebears prolonged themselves to appear in the adult of their descendants (Cope, 1877; Gould, 1977; Montagu, 1989), modern humans. Just as our species biologically has delayed in maturation over millions of years, society at this time is revealing the same dynamic. That which

is ancient is manifesting in the present day. Rock 'n' roll is but one feature of our ancestors' society emerging in contemporary times.

This comes with two seemingly contrasting features: a deep reverence for creativity and a reflexive connection to community.

Emerging modern society, as split as it often seems and feels, is twisting its way around to acquire many of the features of our aboriginal roots. The United States has led the way in many ways by being a place where the creative ones come together, a place where the youngest sons and daughters of Old World immigrants mixed with those of aboriginal African descent.

What emerges is a society not bound by ethnicity but by its reverence for celebrating difference. Innovation becomes the currency of respect.

As highly stratified, hierarchical and patrifocal as American society seems to be, there also seems to be an argument that the United States is at the vanguard of a surge in innovation and creativity that will result in a horizontal community of creative innovators who embrace interdependence and a reverence for the commons.

We already hold egalitarian truths to be sacred. All that's left is to wrest control of assets from the elites. By reassigning our reverence for the entrepreneur to the creative innovator, the artist, we retain our universal respect for he or she that stands out while making sure that he or she stands out for contributions to the whole.

We often fear the future because it holds so much that is unknown. Consider that with the neotenization of society, the future may feature many characteristics of the past. Aboriginal music may become YouTube hits. Ongoing ritualized creativity may become the norm. Craft may reemerge in life.

That which is unique about America may go through metamorphosis and become that which becomes unique about our species: a reverence for the individual that makes a creative contribution to the whole. Central to this aboriginal individualization, this neotenous integration, are the blacks.

~

Two biological processes impact the American black population, resulting in increased learning disabilities, specific medical maladies and challenges not familiar to most other ethnicities and most whites of European origins (Geschwind & Galaburda, 1987). In addition to the challenges of these biological circumstances, as a result of these processes the American black population is also blessed with gifts that provide recognition and respect, and now the presidency.

There are three primary genetic pools in Africa. One genetic source is believed to have resulted in literally all other humans that have distributed themselves about the world since the diaspora of 50,000–80,000 years ago. The other two are far smaller, located in central and east/central Africa. All three are relatively ancient compared to the many other ethnicities across the planet.

Darwin (1859) observed, while breeding pigeons, that when two widely divergent threads or strains mate or blend, having had no genetic contact for a prolonged period of time, the progeny often reveals traits of the last common ancestor. For example, Chinese pigeons were bred in isolation from European pigeons for more than 2,000 years. When cross-bred, they revealed features of the rock pigeon, ancestor to both derivations (Darwin, 1859).

Breeders, mating different breeds, would sometimes observe a surge of archaic features that would offer robust health to strains long separated from their origins (Darwin, 1859). Sometimes individuals would emerge that seemed an echo from the past, less useful for their purposes.

American blacks in large measure are a mix of African blacks and a variety of other European and indigenous American ethnicities. This mixture has resulted in an American population infused with the neurological and physiological repercussions of the emergence of features of ancient archetypes in the present day. At an extreme, many American blacks have been burdened by learning disabilities as they seek to navigate written languages, while at the same time they are gifted by a facility with speech and dance.

There are negatives and positives in this mixed genetic landscape. There may be those carrying very old prespeech genetics, offering strengths for communicating in gesture (Hewes, 1973) and song, with

neurologies demanding constant rhythm and touch. They are not born into an environment mirroring those demands. These may be some of the children that become autistic.

Profoundly complicating the implications of crossed genetics is the impact of seasons on genetics cued to equatorial light patterns. Peoples living near the equator are used to 30-percent testosterone fluctuations responding to diurnal (daily) light cycles (Geschwind & Galaburda, 1987). Taken from their geographic origins to a land with seasons, the immigrants' pineal gland interprets winter as night, summer as day, resulting in testosterone thresholds that last months instead of hours (Geschwind & Galaburda, 1987). There are a number of implications. One area of impact is the mother's uterine testosterone, changing according to the season, modifying the maturation rates of her children according to their season of birth. A mother's testosterone level regulates progeny testosterone levels (Geschwind & Galaburda, 1987) and maturation rates. The result is children skewing toward the maturational extremes, with higher and lower testosterone thresholds than the standard societal distribution. The result is both maturationally delayed males (Schatzki, 2010) and maturationally accelerated females (susceptible to autism [see Schatzki, 2009], learning disabilities and specific medical maladies) and maturationally accelerated males and maturationally delayed females (susceptible to a different variety of medical maladies and different learning disabilities).

These individuals occupy the position of hormonal outlier in the four social structures this model suggests exist.

Marian Annett (Annett & Manning, 1990a) hypothesized two different types of dyslexia based on two different kinds of neurologies. One set had difficulty with phonology; the other side was challenged in the ability to visually represent language. I would predict that the American black population would display both these forms of dyslexia at higher rates than other populations based upon the varying thresholds of mothers' uterine testosterone levels. I would also predict strong opposite season-of-birth correlations for these two forms of dyslexia.

Regarding the contribution of the black, formerly aboriginal, population to the American neoteny trend directions, most slaves were kidnapped from West Africa. Many tribal precolonial areas of West Africa

exhibited strong matrifocal, matrilineal/matrilocal societies. There are features of these populations that suggest neotenous males and accelerated females. One such example is the larger testicles of African males, particularly when compared to patrifocal Asians (Diamond, 1986). African matrifocal societies would encourage bonobo-like promiscuous relations (Blount, 1990; Kano, 1992), reinforcing larger testicles in males to produce more sperm. This is in contrast to a highly patrifocal Asian society where gorilla-like social structures, with male control of female sexuality, would breed no need for prodigious sperm creation.

Mixing formerly separated genetic populations and exposing equatorial populations to changing seasons are two ways to both compel challenges and offer gifts. Pushed to hormonal extremes with unconventional maturation rates, individuals both suffer and transcend. The astonishing number of gifted black athletes and orators has much to do with impacts noted above. Barack Obama is just one example of the gifted, lanky, left-handed, brilliant communicator, the classic maturationally delayed male. Perhaps with increased funding in education, many more will be able to take advantage of the unique biological circumstances that have resulted in the black American.

American blacks often display matrifocal aboriginal origins, testosterone-pineal gland effects (Geschwind & Galaburda, 1987) compelling exaggerated maturational delay and acceleration, and cross-fertilization with other long-separated ethnic variations, causing the emergence of ancient talents and inhibiting anachronisms. The African ethnicity, dragged to the New World, is changing our current world with its newfound strengths.

~

I've talked about the effect of sunlight on the pineal gland, which can change testosterone levels of immigrants from equatorial regions (Geschwind & Galaburda, 1987). Equatorial people with established, normal, daily 30-percent fluctuations in testosterone move to northern climates and experience fluctuations that last for months, thus compelling radical changes in a mother's uterine testosterone levels (Ge-

schwind & Galaburda, 1987). Unusually high or low mother's uterine testosterone levels can cause unusually high or low testosterone levels in her children (Geschwind & Galaburda, 1987), translating into exaggerated maturational delay and acceleration (depending on the season of conception), which can contribute to autism (Baron-Cohen, Lutchmaya & Knickmeyer, 2004; Auyeung et al., 2009; Robotham, 2010).

I've noted these effects on American black populations. Another population influenced by these processes is the Latino immigrants from South and Central America. Studies could be conducted to trace the effects of sunlight on the pineal gland by noting the country of origin of Latino individuals, their proximity to the equator and how far north those individuals have traveled.

There are several issues.

First, how often do these people return to their country of origin? The more frequent their returns and the longer their stays, the less influenced they will be by the testosterone-pineal gland effect.

Second, conceiving and bearing their children in Seattle vs. San Diego will likely influence the mother's testosterone levels in different ways. I would predict that Seattle Latinos have higher incidence of left-handedness, autism and other symptoms related to these issues, such as allergies.

Third, there may be father effects. Recent age-of-father studies (e.g., Shelton, Tancredi & Hertz-Picciotto, 2010) suggest older males are more likely to sire autistic children. This may be related to a father's testosterone level dropping with age. If the father's testosterone levels at the time of sperm creation influence the testosterone levels and maturation rates of his children, then where the children are conceived (how far north or south) may influence the children's maturational disposition.

Fourth, not all indigenous South and Central American populations share the same social structure tendencies. Egalitarian communities, such as the Mayan people, with their matrifocal tendencies, exhibit male maturational delay and female maturational acceleration, unlike some South American tribes with the opposite disposition (Chagnon, 1979). Individuals from matrifocal communities are more vulnerable to testosterone-pineal gland effects than their patrifocal counterparts.

Fifth, if an indigenous American or Latino woman or man mates with a black, Asian or White, the progeny may reveal features or characteristics of the last common ancestor, a not uncommon effect. This, in combination with testosterone-pineal gland influences, may in combination further thrust children toward male maturational delay, female maturational acceleration and autism.

Sixth, it is possible that there will be multigenerational echo effects. Second-generation Latinos marrying and then conceiving children at the same time of the year as they themselves were conceived may further boost the influence of seasonal testosterone-pineal gland effects. Whereas the first generation may not have exhibited effects of extreme maturational delay or acceleration, a second or later generation may show those influences, particularly if other environmental testosterone-influencing variables are in play, for example, if the mother smokes (Khaw, Tazuke & Barrett-Connor, 1988).

Seventh, there are many environmental effects influencing testosterone levels in males and females (e.g., diet; see Hamalainen, Adlercreutz, Puska & Pietinen, 1983). A Latino mom eating an American high-fat diet, unfamiliar to her before her migration, can dramatically increase testosterone and estrogen levels, influencing her children's uterine environment (Ahluwalia et al., 1981; Hamalainen et al., 1983).

In the way that we observe blacks impacted by changes in geography, we are likely to see the same variables influencing Latino populations. Frequent travel back to the country of origin will mitigate the testosterone-pineal gland effect (Geschwind & Galaburda, 1987). Other influences noted above may exaggerate them. Just as there have been dramatic increases in allergies for blacks, similar symptoms may appear in Latinos. Other maladies influenced by testosterone levels are also in play, such as prostate cancer (Ahluwalia et al., 1981). Autism is not the only condition influenced by testosterone levels.

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Thirty years ago in Guatemala, a student of Marian Annett, W. J. Demarest, evaluated Mayan and Ladino (mixed Spanish and Indian)

children to see if their handedness distributions were similar to Annett's UK studies (Demarest, 1982). Annett hypothesized that the way that the British are cerebrally organized would carry over to humans across the planet, based upon the fairly consistent manifestations of left-handedness that are observed.

The conclusion of the Guatemalan study suggested that the Mayan children did not exhibit the same distribution of handedness, implying a different distribution of cerebral lateralization (Demarest, 1982). The Mayan children drifted further to the left, emphasizing that they might be less lateralized for language (Demarest, 1982). The thesis of this website would argue that the Mayans exhibit a more matrifocal social structure than Western societies; the left drift in handedness appraisals would suggest an older genotype.

In another study (Chagnon, 1979), indigenous Americans located in the Amazon rain forest were described as being more right-handed than the European norm. The Yanomamo of the Amazon are violently patrifocal with ratios as high as 140/100 male/female, with female infanticide being the convention (Chagnon, Flinn & Melancon, 1979).

If we assume that South and Central American indigenous populations migrated from Asia at about the same time, and that varying handedness distributions across the Americas reflect social structure, then it would be interesting to consider that as social structures went through metamorphosis over time, those changes were accompanied by degrees of handedness.

15
Artists

> Musical composers, instrumentalists, and painters were compared with nonmusicians from a student and from a nonstudent population on testosterone levels in saliva. This steroid served as a marker for physiological androgyny. The ANOVA showed a significant group by sex interaction. Male composers attained significantly lower mean testosterone values than male instrumentalists and male nonmusicians; female composers had significantly higher mean testosterone values than female instrumentalists and female nonmusicians. Painters of both sexes did not differ significantly from controls. Spatial ability was assessed in the five groups. Significant differences on spatial test performance were not reflected in differences on salivary testosterone. Our results showed that musical composers of both sexes were physiologically highly androgynous. Creative musical behavior was associated with testosterone levels that minimized sex differences. (Hassler, 1991, p. 25)

> In an auditory or musical memory task, subjects made pitch recognition judgments when the tones to be compared were separated by a sequence of interpolated tones. The left-handed subjects performed significantly better than the right-handed and also had a significantly higher variance. Further analysis showed that the superior performance was attributed largely to the left-handed subjects with mixed hand preference. (Deutsch, 1978, p. 559)

The role of an artist in a society changes from society to society, epoch to epoch, but one thing remains the same, by most definitions. An artist seeks to create bridges from societal conventions to the human

condition, from everyday to dream, from the mundane to the transcendent. An artist's role is to share work that may at least part way heal the wounds that come from the struggle to survive inside a society. Each artist has a different idea of how to perform the healing act.

By allying himself or herself with a creative act an artist, by definition, performs the job of usher or doorman, making it possible for members of the audience to find a seat and be exposed to an experience whose source comes from some place different from what they are used to in their everyday lives. Each artist has different goals in what he or she would like the audience to experience. Nevertheless, the artist himself is looked upon as an individual qualified to guide the audience to an experience that will evoke a useful and/or beautiful understanding that will result in healing.

The Orchestral Theory of Evolution that this work presents places the artist in a central position in several ways. I hypothesize that dance and song drove human evolution operated in a Fisherian runaway sexual selection (Fisher, 1930) feedback loop that exponentially grew brains and proliferated unique behavior. Neoteny is central to this dynamic, and creativity is essential to what makes human beings unique. Neoteny prolongs or carries forward embryo and infant creativity into the adult of our species.

> There is evidence that musicians are androgynous persons (Kemp, 1982; 1985; Hassler et al., 1985; Hassler & Nieschlag, 1989). Due to the relationship between spatial and musical capacities, sex hormones, particularly T as the pre-hormone for its biologically active metabolites, may contribute to the development of both musical talent and spatial ability. (Hassler, 1992, p. 56)

Artists were always at the far left end of societal balanced polymorphisms, and this left end sought to encourage lives that were both beautiful and useful. In addition to the work that they produced, artists as individuals represented an altered consciousness that allowed conversations with things difficult to understand or difficult to integrate with conventional experience. In the context of the current horizontalization of society, featuring the neotenization of contemporary culture, the skills of an artist, a person with some ability to travel to

where creative forces lie, are exploding across the human spectrum to characterize conventional relations.

Every artist has a different message, a different struggle that he or she is seeking to understand. Yet, every artist, by offering a medium his or her attention, makes the *process* of making connections valid. This new aesthetic, stewardship, or, if you will, this feminine society, is an artistic society at its core as we, as a society, offer attention to that which underlies conventional consciousness.

Artistic healing comes in two main forms.

One side, those enamored of Occam's razor, believes that god thinks like an engineer, or, how god thinks, or if he even exists, is not relevant. The most elegant solution to a problem, the solution with the fewest steps, is probably the correct answer to that problem. The universe reflects this male frame of mind. This is the low-estrogen creator.

On the other side are those for whom an outcome is more about the journey than the destination. Occam's razor is for those who need a shave. But these other people are more likely to believe that our world was created by an artist, not an engineer. A female artist. A female artist that doesn't care how fast or efficiently a thing can be accomplished but instead focuses on how elegantly a thing can reflect the larger whole. This is the high-estrogen creator.

Yes, elegance is important. Yet, elegance without an intuition for interconnection is but one half of an artistic balance.

William Paley was an English religious philosopher popular in the eighteenth century who wrote reverently about biology and spirituality. He inspired a young Darwin and many other biologists of that epoch (Gould, 2002). In a sense, the estrogen perspective as seen from this well-to-do, white, male point of view was the bathwater thrown out when the baby of evolution was embraced. The baby has not been bathed since natural selection was embraced, at least by academia. We've been raising this wolf child of a natural selection theory without the benefit of a woman's touch, without periodic bathing to keep it healthy.

Biological evolutionary theory has grown feral from lack of the estrogen perspective. Music, rhythm and artistry connect the represen-

tatives of the neotenic fringe that is barreling into modern times. The prolongation of infant features into the adult of our species provides matrifocal social structure an ability to reestablish itself, emphasizing the artistic perspective.

Artists are often trained to communicate non-narrative experience through narrative or non-narrative media. This is one of the things that makes art nurturing. Art provides a window into the non-narrative, primary process experience of being human. I would argue that non-narrative experience is most of our experience. That so many of us are so unfamiliar with our non-narrative selves suggests why our academic disciplines are so separated from one another. We are not trained to make connections, particularly when it involves connecting to the primary-process, simultaneous-time nature of existence. Still, theorists seek to understand how things work and translate those workings into an understandable story.

The media that is the message for our time is the many-to-many new technologies, such as the Internet and cell phone communications. Transparency, diversity and horizontal communication are integral to this new wave in interaction. The artist, he and she integrating personal experience with environmental patterns to create examples of synthesis, is central and necessary to this new world view.

Former barriers to artist employment are being shattered by the destruction of the entrepreneurial paradigm. Artists will no longer be pariahs suggesting where our hypocrisies are buried. We can again turn to those who specialize in providing insight into our predicament. The Internet can enhance and encourage our turning in our artists' direction.

Central to the neoteny dynamic, the matrifocal surge that is underway is the artist demonstrating and exhibiting creativity. Creativity is the essence of our earliest ontogeny, that which we identify as the result of conception. Not only are features of infancy and the uterine creativity integral to current human adults, but that process of early ontogeny creativity tying past experience with current environment is part and parcel of the creative artist's experience.

Engaging in creativity, we engage in neoteny both by prolonging into current understanding the creativity dynamic grounded in conception, embryonic ontogeny and birth, and by making sense of our

experiencing consciousness as both lodged in primary process and the narrative reality peculiar to those with split consciousness.

The artist both reveals our sources and connects those sources with current times. It is the artist who explains what is happening at times like these, when our very species is experiencing transformation.

16

Gays and Lesbians

> The raised incidences of strong left-handedness and of mixed-handedness in homosexual men, as in dyslexics, are mutually consistent under the normal distribution function, as expected by the right shift theory of handedness. It is argued that atypical laterality in these groups is better described as a "reduction of right shift" than as a "left shift." (Annett, 1988, p. 341)

I've proposed several specific groups of people that are particularly involved or invested in the neotenic trends currently underway. This includes the female, youth, relatively recent aboriginal immigrants (blacks and Latinos), the poor, artists and the autistic.

Phonetic dyslexics (Annett & Manning, 1990a); stutterers (Corballis, 1981; Bryden, McManus & Bulman-Fleming, 1994); many Tourette's sufferers (Shapiro, Shapiro & Wayne, 1972); many gifted athletes (Geschwin & Galaburda, 1987), mathematicians (Geschwind & Galaburda, 1987), artists (Hassler, 1991), musicians (Deutsch, 1978; Hassler & Gupta, 1993), and composers (Hassler, 1992); many schizophrenics (Crow, Done & Sacker, 1996; Crow, 1997); specific alcoholic types (London, Kibbee & Holt, 1985) and many obese women (Geschwind & Galaburda, 1987) are individuals located at the left or matrifocal end of this societal balance that I've been describing. In addition, there are many homosexuals and lesbians firmly positioned in matrifocal social structure displaying high testosterone women and low testosterone men.

A number of studies suggest evidence of the predilection of both gays and lesbians for neurological and endocrinological male maturational delay and female acceleration (e.g., McCormick, Witelson & Kingstone, 1990; McCormick & Witelson, 1991). Both show higher incidence of left-handedness (McCormick, Witelson & Kingstone, 1990). Males evidence lower testosterone, females higher, with uterine conditions that feature higher testosterone enhancing the likelihood of male and female homosexuality (McCormick, Witelson & Kingstone, 1990).

McCormick and Witelson (1991) noted specific neurological differences between heterosexuals and homosexuals, with McCormick, Witelson and Kingston (1990) observing greater numbers of left-handers among both lesbians and gays. Stress increases testosterone levels in women (James, 1986). Dorner, Schenk, Schmiedel and Ahrens (1983) observed that increased stress in a pregnant woman increases the chance of a homosexual son. Annett (1988) notes the higher percentages of left-handedness among gays, compared to dyslexics, and she suggested that this increased the likelihood of anomalous dominance or two cerebral hemispheres the same size.

> A study of handedness, dyslexia, stuttering and twinning was included in a study of sexual habits of homosexual men. A questionnaire was mailed to homosexuals, and 394 forms suitable for data analysis were received. The results showed an increased rate of lefthand writing (17.5% compared to 8-8.4%), and a clear left shift. There were increased occurrence of both stuttering (7.1% compared to 1.6%) and reading difficulties (7.9% compared to 1-3%). The incidence of twins was lower than the population (1.3%). The results confirm earlier attempts to show a left shift in homosexuals, and support Geschwind's hypotheses about etiological factors for both lefthandedness and homosexuality. (Gotestam, Coates, & Ekstrand, 1992, p. 179)

This thesis suggests connections among homosexuality, autism and Asperger's, with a higher than expected congregation of both autistics and gays in family of origin. It might also be the case that those with Asperger's will display homosexuality a higher percentage of the time, with both groups evidencing maturational delay.

17
The Autistic

> Primary process is characterized (e.g., by Fenichel) as lacking negatives, lacking tense, lacking in any identification of linguistic mood (i.e., no identification of indicative, subjunctive, optative, etc.) and metaphoric. These characterizations are based upon the experience of psychoanalysts, who must interpret dreams and the patterns of free associations. (Bateson, 1972, p. 139)

In addition to evolving as a society, we experience our biology transforming. There has been a return of matrifocal values that include horizontal interconnection and the original classic matrifocal social structure neurological structures. I predict that the numbers of left-handers will be shown to have been increasing along with the numbers of neurological conditions characterized by both cerebral hemispheres being the same size with a wide corpus callosum. One in 60 males is now estimated to feature autistic traits (Rice, 2009). These include members of the self-described neurodiversity movement. Many autistic and Asperger's individuals are stating that they are not subjects of a disorder, but members of this new order. I would suggest that the representatives of this neurodiversity movement embody the reemergence of matrifocal protosociety in a context where their strengths and intimacy with nondifferentiation can become the guide and balance to the modern paradigm.

Details on the autistic and Asperger's are in their own section.

IV

Interlude: Mississippi as Metaphor

Interlude

Imagine the Mississippi as representing changes in a species over time. At the source, Itasca in Minnesota, clear water emerges from beneath the earth in a pristine environment featuring wildlife and virgin forest. At first a trickle, the stream picks up speed and breadth, finally leaving the protected environment of the park.

The river grows wider as it meanders south. Houses and later towns appear beside it. Soon, industry emerges, and before too long, boats carrying the product of industry share river space with tourists and local boaters.

At the other end of the river, New Orleans, the river is girdled by cities on both sides, and there is massive commercial and industrial activity and almost a million people. Cities like Baton Rouge offer single corporate sites square miles in size, using the Mississippi as an opportunity for profit.

Driving down and up the Mississippi with my son, I am sensitive to the ways he is different and the same as I, as I am similar yet vary from my father. We are not just part of a family line; we are a sequence in the unfolding of a species. There are ways that our participation in a species transformation transcends our lives as individuals. I feel aware of how deeply I have been influenced by my dad, in ways not unlike how I have influenced my son. It sometimes feels to me that the thing we three represent, a species lineage, is far more powerful than the individual identity that we usually take so seriously.

A lineage has a life that transcends individuality. Our commitment to time as a thing that has a past, present and future obfuscates the reality of lineage. Remove time, and we that are related become the same.

Imagine Minnesota's Mississippi River wildlife and protected trees reaching their way down the river, prolonging "infant" neotenic features to appear farther south with time. If the Mississippi represents a species over time, a lineage of individuals, consider how the river would look and behave if nonhuman nature was to cascade its way down the river over time as factories closed, houses were abandoned and river boats retreated south.

In the way that human progenitor chimpanzee-like infant features prolonged and appeared in descendant adults over millions of years the Mississippi River can reveal river source features in the way the river looks downstream. After a long period of time, New Orleans becomes a pristine estuary with humans only visiting to observe nature. The whole rest of the river has become a boat-free zone with trees and prairies hugging a thousand-mile bank.

This would be river as metaphor for how humans evolved. We can go the other direction. Instead of prolonging infant features into adults over time, bridging virgin forests to estuary endings, we could go backward and accelerate adult or estuary features so that they move north up the river, against the flow. Larger and larger cities would appear farther and farther north. The huge petroleum processing plants of Louisiana would expand into Arkansas, Missouri, and last, Minnesota. Finally, factories would ring the source of the Mississippi as the forest would be removed.

Imagine the Mississippi as a species. The evolution of features would radically differ depending upon the direction of feature evolution. Though the flow of the river would always follow the flow of time, the river's traits would reflect the direction of this trait trajectory. The character of the source would flow downriver, or the features of the estuary would creep north.

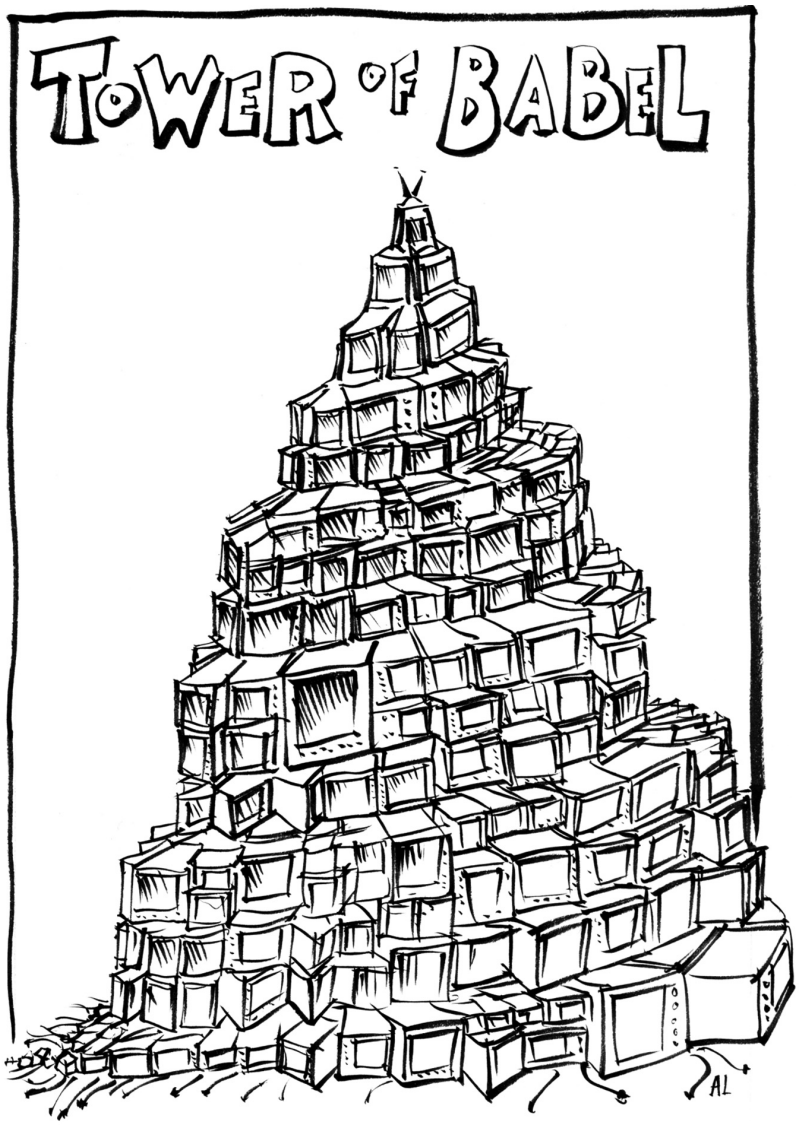
This is an imperfect metaphor. As humans have exhibited neoteny, they have revealed more sophisticated society until culture appeared and things went crazy. If the accoutrements of culture are created by neoteny, then factories and fir trees are not opposites.

Nevertheless, species unfold or flow through time. Grandfather, son and grandson can be alive at one time. Humans are submerged in an experience characterized by identification with a body that has a limited awareness span. Using the Mississippi as a metaphor for species allows an identification with evolution over time and an understanding of a species as a transforming entity with ongoing beginnings, middles and ends.

Beginnings and ends of species are the doorways to understanding directions in which species evolve.

Sources and estuaries of rivers provide insight into how rivers can transform.

Rivers, sons and fathers can provide insight into species evolution. The trick is to take the emphasis off of individuals and view evolution as an outcome of a longer time span, a lingering now. Adjusting time as a variable when exploring evolution provides leverage as we seek to understand how species change.



V

Current Society: Transformation Features

18

The Sharing, Aesthetic Economy

> "Neoteny" is "remaining young," and it may be ironic that it is so little known; after all, human evolution has been dominated by it. Humans have evolved to their relatively high state by retaining the immature characteristics of their ancestors. Humans are the most advanced of mammals–although a case could be made for the dolphins–because they seldom grow up. Behavioral traits such as curiosity about the world, flexibility of response, and playfulness are common to practically all young mammals but are usually rapidly lost with the onset of maturity, except for humans. Humanity has advanced, when it has advanced, not because it has been sober, responsible and cautious, but because it has been playful, rebellious and immature. (Robbins, 1980, p. 19)

We are observing an integration of almost 200 national economies, the abyss of environmental destruction forcing cooperation among all manner of differences and a surge in the Internet and communications technologies. As classic capitalism continues to fail, we are heading at breakneck speed into a world where success is measured not by how many things we own or how many assets we control, but by our contribution to the relationships we are a part of.

Two additional features of the very young have been somehow absent from discussions of the influence of neoteny on the human species. Perhaps this absence is because it is mostly males writing on the subject. Maybe it is because these two features are obfuscated by the way we humans view ourselves in contemporary society. Nevertheless, observing closely the behavior and experience of babies, extrapolating these observations to a tentative hypothesis of the behavior and experience of our chimp-like ancestors, we might conclude that contemporary humans and contemporary human society may have no small amount to do with the dynamic of heart-felt affection and dependency.

In other words, the affection experienced by the young for other humans in their life is an integral experience, usually ignored as a governing principle, yet it is an experience having massive impact upon our society. The young feel affection and they experience a compulsion to connect, what we call dependency. Being small is to experience a nonstop attraction to other humans, animals, things and situations while at the same time experiencing the constant buffeting that comes with exposure to the barriers that prevent a reciprocation of that attraction. Human babies and toddlers are extremely dependent relative to the young of other species. As this dependency paradigm manifests in the adult of our species, the relative importance of affection and connection will grow as adults acquire these aspects of the infant.

The massive, multiscale interconnection of contemporary society, with exponential increases in connection characterized by at first email, then the web, then texting and now social networking, are manifestations of infant dependency proclivities prolonging into older states of ontogeny, driving society into a whole.

We are in the midst of as profound a transformation of our society and our species as can be imagined. Differentiating between societal and biological evolution in humans is no longer possible.

We can understand the neotenous engine behind our biological evolution and observe the manifestations of neoteny in society as earlier and earlier stages of an individual's ontogeny emerge in adults. We observe biology's transformations manifest in culture, almost before our eyes. We are left reeling.

We are also left feeling. Affection and dependency are in our societal future and our ontological past. Neoteny is not particularly discriminating in what infant features are carried forward to adulthood. Love is inevitable. So is vulnerability.

We are observing the evolution of the web and the slow dissolution of our consumer economy. There is an emergence of creativity and appreciation in purer, less hindered forms as the Internet encourages the pairing up of performers with audience. Without the barriers of money, geographic distances or even language, venues have emerged, such as

YouTube, that allow a profound proliferation of creative content while training visitors to see and listen with new eyes and ears.

The line between creation and appreciation is becoming blurred. I'm observing young people creating/assembling music and video content while absorbing the productions of their peers. The transition between perception and production seems to be growing smaller, the difference more difficult to define. There is the old paradox where the act of giving provides more satisfaction to the giver than to the recipient, and this paradox is somehow manifesting in society's new sharing, aesthetic economy. The boundary between producer and consumer is disappearing.

In the consumer economy, ostensibly the consumer was being provided great gifts. These bonuses were accompanied by a destruction of natural resources, the encouragement of a highly stratified society and a denial of the basic right to be free of want. We've been living in a parody of the creator/appreciator paradigm as the creator is encouraged to victimize the receiver. Some of the most creative people on the planet have been creating advertisements to tell a powerful story to compel a person to spend money with the creative person's boss's client.

We are shifting from a consumer economy to an aesthetic economy. It may seem like this is happening very quickly, but the consumer economy itself has been a transitional phase that provided a bridge from the preceding economy, which was characterized by a basic exchange of goods and services. That basic economy itself grew from an ancient, aesthetic economy characterized by craft.

In a sense, we've come full circle. We're returning to an appreciation for our own productions with an enhanced ability to produce and deliver whatever we might devise. Accompanying this freedom to create/appreciate is a potential to again become familiar with our unique creator/appreciator human sensibility. Society, the society of the web, is manifesting a spiritual frame of reference, one where reverence for creation is integrated into its operations. This is a deeply secular orientation, though it suggests an experience of immanence. A religion or mythology is unnecessary.

Back when we were first painting bodies, weaving, carving and chipping tools, spirit was integrally tied to the productions of society.

There was no difference between the two.

Consider that with the Internet, god the creator and god the appreciator has returned. Strip religion of everything but process, dump the mythology and words and what's left is nothing but Internet.

19

Female Infanticide and Abortion

> There are three societies, accounting for 28 of the populations, which are coded in the Ethnographic Atlas as patrilocal or virilocal (the Yanomamo account for 26 populations). The average sex ratio in the junior age grade for these populations is 142 males per 100 females. Seven of the societies are coded in the Atlas as uxorilocal or neolocal, and the remaining case, the Guana, appear not to be patrilocal. These eight societies account for 20 populations with an average junior sex ratio of 103 males per 100 females. Thus while the warring societies as a whole have an average junior sex ratio of 126:100 it is the patrilocal component of the sample which produces the bias while the nonpatrilocal component shows a nearly even sex ratio. This correlation suggests that there are different cost/benefit ratios for raising daughters, given different residence arrangements. For this sample at least, nonpatrilocal systems do not support female infanticide . . . . Divale (1974b) has shown a correlation between external warfare (in the absence of internal war) and matrilocality, and Harris has elsewhere emphasized this correlation (1977), noting also an association between matrilocal residence and a 'diminution in preferential female infanticide' (1977:63). (Hawkes, 1981, p. 83)

In a sense, the ship of state can steer left or right, depending on how many girl babies are thrown overboard.

Embrace the female. Innovation can proliferate as criteria for the perfect mate can vary as a larger number of young women can choose from a wider variety of men.

Suppress the number of women by killing them as embryos or babies. Then fewer men can sire a child and only those highly valued, aggressive male personalities can achieve a mate. In a patrifocal society, those highly valued males can often effectively wield authority and obediently serve the established hierarchy. Creativity is not their strength.

On one side towers the Pill, the 60s symbol of goddess, placing sexuality in the control of women and providing females the power to decide when to make love and if they will be fertile.

On the other side sits AIDS, symbol of patrifocal, socially conservative Republicanism, demanding that sex stop now and that contraception and abortion be banned.

The Pill vs. the virus, joy vs. fear, matri vs. patri are parts of the battle of social structures, the oldest human civil war of all, where the female newborns are the disappeared.

Contrary to what the Neo-Darwinists and sociobiologists would suggest (Gould, 2002), evolution is a lightning-fast process driven often by sexual selection, often by abrupt changes in the rate and the timing of maturation. When prolonged, these changes in rate and timing are called neoteny. One way we have been controlling our own evolution is by committing female infanticide. Another way we direct how society transforms is by choosing mates for their nonviolent, creative, cooperative tendencies.

Male control of the female body is a hallmark of a patrifocal society, the Right Wing and hierarchical societies. It is no mistake that the contemporary Republican Party has its roots in the anti-abortion movement.

Traditionally, in a patrifocal society, such as the Chinese or the Yanomamo of South America, society seeks the death of girl infants (Chagnon, Flinn & Melancon, 1979).

In a highly patrifocal society, it is vital that the pool of potential wives be repressed. With few child-bearing females, only the males considered most ideal as husbands will be chosen by the fathers or families of the available women. In a warrior society, or a very competitive, highly hierarchical society, the males that fail to perform will go mateless. Aggressive, competitive males will procreate and bring higher testosterone warriors into society.

In a highly classist society, where family of origin is the most important trait, males from families with the fewest resources will find the girls all taken. In India, many females are aborted.

In intensely hierarchical societies, such as China, where allegiance to position is highly valued, killing the girls, usually before they're born, can prevent streaks of independence from appearing in a society that would damage ancient social scaffoldings. Independent-behaving males would not be chosen as a mate.

Loosening up societal ideals of the perfect mate provides opportunities for far more variation in the look and behavior of that culture. Over thousands of years, a society can oscillate in social structure according to the number of girls it chooses to kill. It is no mistake that some of the world's longest living, most stable societies are those that practice female infanticide. It is also no mistake that some of the most violent tribal cultures make the girls disappear.

Contraception empowers women as the ideal mate moves away from being the male in control.

The vast creativities unleashed in the United States have had no small amount to do with there being far fewer constraints on the ideal mate than in other societies in the world. The barriers of fashionable traits in human beings began falling with the influx of widely varying tastes among immigrants. With staid, hierarchical societies like China and India now embracing ideals that encourage creative independence, watch for surges of creativity where baby girls will all soon be allowed to live.

The abortion battle is not over whether killing babies is moral. The abortion battle determines the social structure of society. If females can kill an unborn infant, then future mate selection also reverts to female choice. Females can choose to abort and each can choose her husband according to criteria that support her personal point of view.

Among those males now easily finding mates are those maturationally delayed, noncombative pattern manipulators and creative types. "Wimps," "nerds" and sensitive males are marrying in greater numbers than in the past. They are giving birth to maturationally delayed sons and maturationally accelerated daughters, thus introducing to society greater numbers of the autistic (characterized by extreme male maturational delay) than have ever appeared before. Not only has an increase in abortions contributed to a plummeting in crime, abortion has resulted in an increase in autistics as women choose males that would have less problem with her having an abortion. These are nonpatrifocal, relatively female-centric males.

In just the way that Darwin (1859) observed humans breeding pigeons, pruning features not desired in an evolutionary thread, humans prune themselves by killing embryos and babies in order to guide society in the direction of matrifocal or patrifocal points of view. There are major differences between political parties when it comes to death. How life is trimmed, when the young are killed, has everything to do with how aggressive the future society will be. As long as society struggles to preserve abortion, providing choice for woman whenever possible, the future will be far less aggressive than the past.

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In the February 27, 2009, issue of *Science* on page 1164 begins an article (see Hvistendahl, 2009) on Chinese government attempts to adjust the male/female birth ratio. At this time, there are 120 boys born for every 100 girls (Hvistendahl, 2009). Female foeticide has replaced female infanticide as the technique best designed to dispose of unwanted females (Hvistendahl, 2009). Still, many baby girls are not taken to the doctor when they grow ill. There are still quasilegal ways to dispose of children.

> Bao and Li are one of four couples in their 600-person village to have espoused uxorilocal marriage, or living with the wife's family. Couples in some regions have opted for this lifestyle throughout Chinese history, but the practice is typically stigmatized. By rewarding daring couples with land and public praise, Care for Girls aims to remove the stigma. Bao says it worked: 'People don't discriminate against you now.' (Hvistendahl, 2009, p. 1164)

Hvistendahl's (2009) article goes on to describe attempts to adjust male/female ratios by intervening in the intransigent patrifocal social structure:

> The demographers realized that reversing the trend would require a major cultural shift. Undermining the patrilineal order, they suspect-

> ed, might do the trick. With Marcus Feldman, Zhu and Li surveyed two counties in China where historically loose clan structure had led to a high percentage of men living with their wives' families. Both uxorilocal counties had a normal sex ratio at birth and low female child mortality. Moreover, matrilineality seemed to provide the same benefits as patrilineality: 'We found that daughters provided economic and emotional support to their parents equal to that of sons,' Li says. (p. 1165)

Researchers in China (e.g., Hvistendahl, 2009) have discovered that social structure is directly related to male/female birth ratios. What other features may these unique, less patrilineal provinces reveal? Perhaps there are additional advantages to relieving oneself of allegiance to a society heavily dependent on the concept that males are more valuable than females. I propose that there are positive economic repercussions.

The Chinese culture is unique in more ways than can be counted. In the West, until this last century, matrifocal tendencies were demonized along with the serpent, a major symbol of the old goddess religions (Campbell, 1964). In Asia, the serpent was assimilated and deified (Campbell, 1964). In the East, matrifocal values were never totally repressed. Asian spiritual paths revere the power of the female while seeking balance between the two hormonal archetypes (Campbell, 1964).

The distance that the Chinese culture has to go to begin to respect the rights of women and arrive at a balance that provides bonuses to all may not be as far off as many think. Though there are many societal habits to be adjusted, there is a spiritual infrastructure that allows for the emergence of the unique. China is seeking profound industrial and commercial innovation and a primary position in the world's economies. By focusing on birth ratios as the symptom of a restraining frame of reference, the people of China may have a high-quality source of information on how close they are coming to acquiring a useful reference for the new global economy.

Patrifocal societies may be both useful and beautiful in a world that requires and rewards stable societies that can survive over long periods of time. Now that our global cultures are integrating, innovation is king.

If necessity is the mother of invention, then China's new matrilineality may be the mother of innovation.

I hypothesize that female infanticide and foeticide are patrifocal societal tools used to maintain a patrifocal frame. Males that don't fit the male patrifocal ideal don't achieve a wife and don't pass on genes. Maintaining a high male/female birth ratio goes a long way toward encouraging long-term patrifocal societal stability.

We live in interesting times. They are changing.

20

Youngest Children Immigrants

> It is satisfying to consider embryos and adults as merely different parts of the slope of a curve subject to natural selection. If biologists cannot agree to Haeckel's concept, 'ontogeny recapitulates phylogeny,' there may be room for a less ringing slogan, 'ontogeny concords with phylogeny.' (Swan, 1990, p. 384)

Our European mythologies are filled with legends and stories of youngest sons and daughters traveling great distances, often receiving aid from mythical beings, to discover riches and rewards that their older siblings were unable to achieve. In the autism section that ends this work, I will describe correlations among older mothers, higher uterine testosterone levels and youngest children exhibiting characteristics of male maturational delay and female maturational acceleration. The older a woman grows, the higher her testosterone levels (Khaw, Tazuke & Barrett-Connor, 1988).

I hypothesize that youngest children will exhibit features of the older matrifocal social paradigm as each family of multiple children reproduces the arc of human evolution over several hundred, and sometimes several thousand, generations. Not only will the autistic most likely emerge late in a mother's reproductive life (with the exceptions of certain first born conditions to be discussed in the autism section), but those children will more likely be the performers, the artists, musicians, talented athletes, dancers, the ambidextrous and the creative. The innovators will most likely be the youngest in any family.

European primogenitor laws offered little inheritance to youngest males, compelling an immigrant population skewed toward youngest sons. Youngest daughters often were the most difficult to find local wives for. These and other factors filled the American continent with individuals with a creative bent, open to innovation, attracted to what

was unusual or new. These were often creative, neotenous males and accelerated females who displayed comfort while exercising authority.

Several variables influence immigrant communities to skew in specific social structure directions, culling out from the community of origin those individuals with particular behavioral predilections. When children of oldest mothers congregate, the result is unique populations with features of ancient lineage forebears. This has had a dramatic effect upon the United States. In the U.S., there has been a mixing of immigrants with unusually nontraditional orientations (children of older mothers) with African aboriginals (often from West African matrifocal societies). The result is a society of performing innovators with tendencies similar to the matrifocal dancers of several thousand generations ago.

21

Testosterone-Pineal Gland Effect

A corollary of our hypothesis is that hormonal effects on the brains of offspring may vary with the time of conception. The activity of the pineal gland changes seasonally with alterations in day length. As a general rule, during the dark winter months the pineal becomes active and suppresses both ovaries and testes, whereas in the summer it is inactive and sex hormone levels are higher. For this reason many animals bear young in the spring, an advantageous situation since temperature and food supplies are more suitable for survival. An example of such seasonal modulation of hormonal effects on the brain is observed in the HVc nucleus of the singing bird (Nottebohm 1981). This description of pineal physiology is, however, somewhat oversimplified. An animal's sensitivity to light may vary through the year. Gonadal hormones may thus become activated in the spring, but as a result of loss of sensitivity to light over the summer hormone levels may diminish as fall approaches. Despite these facts, day length is a powerful influence. Thus, steers increase their weight more rapidly in the winter when artificial light is supplied to lengthen the day. This light-enhanced growth of muscle mass does not take place if the bull is castrated, suggesting that the effect of light is mediated through a rise in testosterone effect (Tucker and Ringer 1982) . . . . If pineal effects on sex hormone levels are important, then the birth months of lefthanders, and of those with learning disorders, might not be uniform throughout the year, since fetuses conceived at different seasons might be subjected to very different hormonal environments. These effects should differ in the Northern and Southern Hemispheres and at the equator, although other factors, such as variations in the ethnic composition of populations, would also have to be considered. Data are still very sparse. Badian (1983) found that in males born in each of the six months beginning in September, the rate of nonrighthandedness was higher than that found in any of the other six months, but no clear trend was observed for female births. (Geschwind & Galaburda, 1987, pp. 116-7)

When I was a kid, my sisters and I would place a marble in the middle of the dining room linoleum floor and watch it begin rolling toward the hallway. Quickly, it would pick up speed, pass through the dining room door and then start lolling back and forth (north and south), and it careened more or less westward across the house. The history of the nearly 100-year old structure, since torn down, was represented in the pathway of the marble.

Tracing the path of societal ideas is compromised by an interpretation protocol that traces only the productions, not the origins, of the mind. We don't think of biology or genetics as informing a discussion of the evolution of consciousness. Exploring the connection between physical and mental when seeking an understanding of culture is not an intuitive choice. It has a lot to do with our not consciously knowing how we evolve biologically and societally. We are left watching the marble, guessing at what might have influenced its path.

No single variable influences our evolution more powerfully than changes in the rate and timing of maturation. Neoteny is the single most influential factor in our divergence from chimpanzee-like progenitors (Gould, 1977). Variations in a mother's testosterone levels while her child is in the womb adjust maturation rates, modifying the personality, physical features, strengths and interests of her child. For example, high testosterone levels in combination with other factors can lead to autism (Schatzki, 2009). Extremely powerful determinants of testosterone levels are the degree and duration of exposure to light (Geschwind & Galaburda, 1987).

Daily testosterone levels are influenced by diurnal light variations (Geschwind & Galaburda, 1987). In Africa and the Middle East, equatorial light patterns throughout the year are relatively constant and do not impact daily testosterone levels to variations of more than 30 percent (Geschwind & Galaburda, 1987). Those variations stay within a constant yearly range.

Africans made slaves and carried to America were forced to labor in the American South, a South subject to very different light cycles than their society of origin. Early in the twentieth century, when blacks migrated to northern cities, additional latitudinal differences came into play. Light varied seasonally and testosterone levels fluctuated wildly relative to the latitude of origin.

The Jewish Diaspora drew Semitic peoples away from regions near the middle of the earth to Europe, where light varies more radically, seasonally, the farther north one goes.

The pineal gland interprets summer as daytime and winter as nighttime (Geschwind & Galaburda, 1987), based upon a multimillion-year equatorial calibration in Africa. Africans in America, as well as Semitics in Europe and now in America, find themselves exposed to radically different light levels compared to their societies of origin. The result is fundamental change in maturation rates in both the directions of neoteny and acceleration (Gould, 1977) because mothers' testosterone levels are moving either up or down (Geschwind & Galaburda, 1987), depending on the season. Also influenced by the season would be when the mother's parents were born, because they would be subject to the same light impact. Over generations, if relations are born in the same season, you can hypothetically get multigenerational exaggerations of the testosterone-pineal gland effects.

In African and Jewish cultures, you get far wider variations of personality, physical features, strengths and interests than you would get in a culture not impacted in this way. I hypothesize you'd also get more cases of conditions characterized by maturational delay (autism, Asperger's, stuttering, OCD) and maturational acceleration (aggression disorders). Jews have had a huge influence on American culture in the arts and sciences. Blacks have had a huge influence on American culture in the arts and athletics. I would suggest this influence is directly related to both cultures having origins in or near Africa, near the equator, and having moved or been forced to move away. I predict that comparisons of African Americans and equatorial Africans living in their society of origin, and American Jews compared with multigenerational Israeli Jews, will exhibit notable differences in exhibition of conditions characterized by maturational delay.

Recently it was discovered that Somalis relocating to Minnesota are having children with autism a far higher percentage of the time than is normal (Gorman, 2008). It was then realized that the same thing was happening in Scandinavia with the Somalis (Kenyanobserver, 2008). The change in light is a possible explanation. This being the case, the birthdays of these children exhibiting autism should be congregating in certain times of the year.

Tracing a moving marble through the hallways of our minds is not as easy as noting the effect of a single variable. Still, the history of culture involves a lot more than the tracing of ideas. It also requires following the bouncing ball as it travels from continent to continent, guiding us to note the influence of light. How we evolve socially and biologically is integrally tied to the consciousness, creativity and inhibiting conditions. Noting light's influence on this process, we might say that no small amount of who and what we are comes from above.

Fluctuations in the endocrinology and neurology of individuals and societies as communities move from equatorial regions to northern climates in contemporary times are having powerful effects. The same process may have had powerful effects upon ancient humans living in East Africa before the Diaspora (Gibbons, 2009). In just the way I hypothesize that fluctuations of testosterone and estrogen influence early synapse pruning and the origin of individual split consciousness, the movement of early human populations to Southern Africa and Europe might have exaggerated already emerging split consciousness effects with a result being an even more powerful propulsion to exhibit culture. The influence of light upon the pineal gland, compelling hormone levels (Geschwind & Galaburda, 1987) to adjust synapse pruning (Saugstad, 1989), thus controlling consciousness, may have in no small part led to representative art, full-blown speech and culture.

22

Multigenerational Effects

One implication of our hypothesis is that even if the genetic endowment of any particular fetus were known precisely, it would not be possible to make predictions concerning the distribution in a population basis. One of the reasons for this relative freedom from genetic determination is that if hormones do play a role in determining laterality, then the effects of testosterone or related substances on the developing brain will be modified by factors not under the control of the fetal genes. Androgens are produced not only by fetal testes and the placenta but also by the maternal ovaries, adrenals, and nonglandular tissues. The fetus can be influenced by the actions of many of the unshared maternal genes. It is reasonable to expect that if a fertilized ovum were transplanted into the uterus of an unrelated female, the final pattern of the brain would be quite different, because the brain would develop in an environment of hormones and other substances that would certainly differ in many respects. It might therefore be reasonable to take a different approach than usual to the genetics of many conditions. One should perhaps consider, not the genes carried by the offspring alone, but rather the genes of that organism existing or active only for the nine months of pregnancy; in other words, one should consider the mother and the fetus as a unit. This unit contains three groups of different genes: one paternal set present in the fetus, one maternal set present in the mother, and another maternal set present both in the mother and in the fetus. The situation is even more complex when dizygotic twins are involved, since the maternal-fetal unit will contain another group of paternal genes. (Geschwind & Galaburda, 1987, pp. 133-4)

Among the legends that have emerged over hundreds and even thousands of years is the one about the seventh son of a seventh son. In just the way that a congregation of youngest sons and daughters immigrating and gathering together hypothetically creates a society significantly different from the society of origin, this endocrinologically based theory of evolution would suggest that there are other circumstances, such as birth order, that could contribute to a unique hormonal constellation. Youngest children siring youngest children would tend to amplify or exaggerate the maturational trajectories, with progeny exhibiting matrifocal traits. The same effect might emerge with oldest children siring oldest children siring oldest children, with trends emerging that display patrifocal tendencies.

There is the possibility of seasonal multigenerational reverberation effects. Second-generation women with exaggerated hormonal levels with accompanying maturational delay or acceleration manifesting in very high or low testosterone and/or estrogen levels in the womb may experience their womb conditions amplified if, at the point in the womb when maturation rates are established, the season is again one characterized by either extreme dark or light, thus mirroring their own birth conditions. The reproduction of identical season-of-birth effects over several generations can hypothetically result in exaggerated trajectories in matrifocal or patrifocal directions, accompanied by conditions and disease associated with hormonal extremes.

Immigrant effects, birth order influences, testosterone-pineal gland impacts from longitudinal displacements and season-of-birth outcomes all compel fluctuations of hormone levels in specific directions, influencing evolutionary trajectories, assigning individuals to specific social structures. When these and other effects stack up and overlap over several generations, individuals may end up positioned as hormonal outliers exhibiting conditions and diseases associated with social structure.

23

Emergence of Dream

> An interesting intermediate between the iconic coding of animals and the verbal coding of human speech can be recognized in human dreaming and human myth. (Bateson, 1972, p. 421)

What evidence is there that aboriginal dream consciousness is re-emerging in modern global culture? In what ways might our society be taking the ship of state below the surface to deep waters mostly familiar to the artist, the mystic and child?

As society becomes more horizontal, exhibiting neoteny, there will be a prolonging of features of the infant into the adult, the aboriginal into modern society, with those that are on the fringes, such as people in poverty, ethnic minorities, artists, musicians, gays, lesbians and the Left, moving toward the conventional center.

There are the perhaps obvious signs of societal transformation seen in the dramatic increases in transparency, vast horizontal communications through new technologies via our youth and an astonishing surge in diversity as people across the world meet and communicate online. We are observing Scandinavian economic and social support models heavily influencing the American economic transformation. Scandinavians, both sexes, exhibit neoteny (Geschwind & Galaburda, 1987). I don't note any enhancement of dream consciousness or the influence of dream on their everyday. But I am observing something very similar.

If features of dream were to emerge into waking, not unlike the vision quests of American aboriginals or aboriginal Australians, how exactly would they manifest?

Alternative online worlds such as Second Life offer not exactly dream, but a shared alternative reality. There are now several different massive multiplayer virtual worlds, including Entropia Universe, IMVU, There, Active Worlds, Kaneva, Moove and Red Light Center.

One of the most robust of these online communities, Entropia Universe, was developed by a Swedish firm. It is free and maintains its own currency pegged against the dollar. It is profitable and growing. Its number of registered participants is passing one million.

Consider that the aboriginalization of modern society involves the integration of virtual realities into waking life. I would also expect a dramatic diminution in reading (reading during dreaming is almost impossible) with a surge in computers with no keyboards but with an ability to interpret what you speak. With a drop in literacy, there will be an increase in articulateness, with those with gifts in the spoken word achieving a prominence impossible in a world where the written word was necessary to achieve status.

Signage will evolve to mostly imagery with a future global written language featuring mostly iconic images instead of written speech. In China, many different languages share the same exact iconic writing system, allowing people to communicate in symbols with no ability to exchange spoken words. Two generations from now, I expect there will be a universal written iconic language with many children growing up without an ability to read or write their own nation's language. Technology will make illiteracy chic. Oralacy, as opposed to literacy, will be in demand.

Applying the effects of ontogeny's neoteny to a different scale, society, one can make predictions on how the future will transform. Noting that dream or dream consciousness is a feature of the very young and of ancient matrifocal aboriginal societies, consider that dream is in the early process of becoming integrated with current waking life.

24

The Transformation of Academia

> Before Agassiz, recapitulation had been defined as a correspondence between two series: embryonic stages and adults of living species. Agassiz introduced a third series: the geologic record of fossils. An embryo repeats both a graded series of living, lower forms and the history of its type as recorded by fossils. There is a "threefold parallelism" of embryonic growth, structural gradation and geologic succession. 'It may therefore be considered as a general fact, very likely to be more fully illustrated as investigations cover a wider ground, that the phases of development of all living animals correspond to the order to succession of their extinct representatives in past geological times. As far as this goes, the oldest representatives of every class may then be considered as embryonic types of their respective orders of familiar among the living.' (Gould, 1977, pp. 65-6)

When the sciences were forming in the nineteenth century and early twentieth century, strong personalities explored fertile new ground and planted concept orchards. Their followers harvested the fruits. Society would draw boundaries estimating what was acceptable to pursue, and sciences would evolve in the directions encouraged. Politics informed insight. Prejudices pushed thinking in particular directions. Discipline seeds were planted that sprouted and grew in the direction of that light.

The light that shines on science often comes from dim understandings derived from assumptions of individuals. These assumptions can create walls that inhibit connection. For example, there are disciplines, such as anthropology and evolutionary biology, that from early on grew at odd angles as a result of prejudices and politics that suggested that females could not inform how species and societies evolve.

Still, 100 to 150 years ago, as fields of study formed, there was an assumption that there are deep connections–roots–connecting the various disciplines. One discipline could inform another. Practitioners often participated in several disciplines at the same time.

Perhaps the most powerful contemporary proponent of fourfold parallelism and strong connections among disciplines is not a scientist, but the philosopher Ken Wilber (2000). Ties among biology, sociology, ontogeny and personal experience somehow have become the realm of the philosopher, whereas 100 years ago this was considered integral to understanding how science disciplines connect. It's almost as if our reductionist zeitgeist interprets making connections as somehow suggestive of a reverence for deity.

Almost like a species evolving to occupy an astonishingly unattended niche, for example, amphibians discovering land, science bigbanged itself into the modern age with the creation of the modern pantheon of disciplines. Things have calmed down as disciplines have subdivided with arcane sub-branches growing further and further away from other sub-branches with innate parallelisms. Those days are coming to an end.

More and more academicians are posting their papers on the web. Mostly, we're still stuck with abstracts, but full works will more commonly emerge with time. There has been an amateurization of media with the rising influence of bloggers for high-quality information and YouTube for current windows on the world. Prepare for an increasing number of high-quality, nonpeer-reviewed papers and academic treatments of ideas formerly reserved for journals only.

It's happening already. Professors, on their own websites, are playing with ideas and posting works that they can't easily find an audience for within their discipline. These academicians are finding that they are having fun. They're finding that they like having fun. Nonacademics are starting to see what they can accomplish.

Just as the web has been revolutionizing and evolutionizing everything it touches, the web will be revolutionizing the science of evolution. How things transform will become as fascinating as the transformations themselves as idea morphing becomes a spectator sport. Divisions among biology, society, ontogeny and personal experience,

the four foundation parallelisms, will blend with one another as the peoples' academia disrespects the walls created by the prejudices and politics of the past.

In Darwin's time, the wealthy male amateur, with no university position, often with a deistic frame of reference, could experience having his work reviewed and integrated into the status quo. By the end of Darwin's century, atheist professionals with degrees exchanged work in peer-reviewed journals, managing and corralling information. The age of the amateur is now returning through the horizontal, transparent and diverse web. There are also signs that the reductionist, materialist milieu is lifting. Will a nonwealthy, contemporary amateur emerge, mythless, yet still exhibiting a reverence for the unknown?

Most magical of all, the wall between science and religion will vanish. When it becomes clear that both science and religion are all about connection, parallelisms between the two will feel so intuitive that it will be difficult to understand why the two diverged.

Of course, mythology will be abandoned by religion. Science will surrender its obsession with separation. Then the light of society will grow clean and clear. The trees of academia will grow straight and strong. The grafting of branches will grow ubiquitous.

Gardening will be how we humans spend our time.

25

Social Networking

> My own expectation is that when the almost totally unknown realm of processes whereby DNA determines embryology is studied, it will be found that DNA mentions nothing but relations. (Bateson, 1980, p. 174)

Friendster appeared and evolved into My Space and later Facebook. Microblogs such as Twitter are emerging and filling different niches. LinkedIn serves the business community. Change.org enhances the nonprofit world and empowers the individual seeking change. Social networking variations are thriving overseas.

It is one of those unique moments not unlike when dinosaurs evolved feathers or when humans began to sing. Social networking has the potential to transform culture in several complementary ways, quickly, in a fashion that allows for deft adjustments to a changing environment (Rheingold, 2002; Trippi, 2004).

First, it's cheap. Second, it's easy. Third, it encourages participation by those with time, rather than by those with money or resources. Entry level facility can be developed in minutes.

Anyone with specific interests can find others of similar inclination, and both are empowered by being members of the group. Human hubs with many connections can thrive in an environment that exhibits this characteristic and offers ways to exercise the gift. The creative can share their creations. The shy can reveal the inner self. The curious can explore. Leaders can lead. The technologists can construct and modify.

Where is this networking headed?

Prepare for a horizontal, diverse, transparent cascade.

Power will surge in the direction of the young, marginalizing the

advantages of age. Those adept at social media will have access to allies and resources formerly reserved for those with decades of experience.

Social networking takes time. Traditional media will suffer. You can't easily advertise to people not paying attention. Social media will help take down traditional media.

We saw how social networking contributed to the Obama campaign. Next is social networking that creates its own candidate. Once political action tools become integrated into social networking applications, we will see the spontaneous emergence of specialty candidates serving niche issues, and we will see social networking-created issue advocates consulting with social networking-created elected officials.

Obama harnessed social networking to raise funds and drive people to events. Soon, social networking will raise funds that drive elected officials to respond to particular issues without initial elected official cooperation. Politics is about to change.

Political parties are founded on hierarchy. Social networking operates horizontally, with transparency, breaking down the barriers that prevent diversity. A political party and social networking are not compatible. The processes are diametrically opposed. The young are discovering that en masse, they can make a difference. Watch for the flexing of young muscle when it is discovered that anyone, anywhere can start a part of a movement, provided the action is specific enough to make it easy to jump aboard.

When it is discovered that masses of people can agree on a specific action to achieve change around a specific issue, political parties will begin to fall apart. The skill of packaging change, learned by one who has spent a lifetime practicing the nuances of negotiation, will disappear. Instead, masses will jump aboard social media-driven particulars that are created by a social networking user that fits the bill of the masses in that moment. YouTube politics.

Soon we will have a universal, worldwide social media matrix allowing individual users the ability to track their exact indirect influence on the interconnected world around them. If a person has an idea, he or she will be able to observe the trail of that idea as it moves out of his or her circle of friends to multiple degrees of separation. We will be able to view the source of the ideas, their distribution patterns and the

human hubs through which information circulates. We will be able to compare ideas over time, their relative speed of propagation, depth of influence and geographic spread. Patterns will emerge over time that will provide users astonishing perspectives on the dynamics of meme (idea) production and evolution.

Consciousness becomes transparent when ideas, their origins and their evolution become available for all to view. Walls come down when people feel empowered, not the other way around. When influence moves to those with time, the advantages of hierarchy disappear. Control becomes less about relationships of influence formed from creating allies while climbing up. Mastery becomes about how to move or influence the influential people that you are connected to around a very particular idea, file, event, issue or date.

The technology exists now. The feathers have formed. Flight is days away.

First we sang, and then we spoke. Now we learn to communicate.

I'm seeing it as a crack between the worlds, not unlike that described by Carlos Castaneda. There were times in the Castaneda books when Don Juan would behave in ways that resulted in Carlos's perceptions being transformed. A world characterized by hidden interconnections would emerge.

Twitter is opening a crack that is providing vast numbers of interconnections among people, establishing a routine characterized by a sharing of massive amounts of information at lightning speeds.

At this time, Twitter mostly seems a game to accumulate followings by offering interest in another person's life. That interest seems often feigned as players seek opportunities to share personal experiences with many people. Nevertheless, in an effort to encourage others to pay attention, there is a tendency to pass on interesting information that has been received, to behave with some authenticity and to be funny or entertaining. I'm observing a number of interesting patterns that are emerging.

Twitter users grow higher-value microblogging personas by finding and passing on information that their community respects. Individuals are being evaluated by their access to information and sorting

criteria for what is passed on. Who we are is becoming characterized by how connected we are. In this horizontal, interconnected, information world, information is valuable.

Suddenly, we have access to worldwide, real-time information on what individuals are concerned with in this moment. Using Google to find blogs that specialized in a particular interest was the last derivation of this trend. We can now search within Twitter to find people anywhere that share our particular interest or point of view. Arcane passions can find reflection half the world away. In real time.

Discovery of a person with astonishingly similar interests can lead to a treasure trove of information. Simply exploring the list of people that the new person follows can lead to interconnections hidden because websites weren't achieving high enough rankings or the information was not easily accessible on the web.

Each individual becomes a hub in the universe of his or her interests. Leaping from hub to hub, exploring followers and followings, I am astonished by the almost infinite variety of connection. In addition, many personal connections are being made as personal messages between connections encourage trust. As time is dispensed in the form of messages, relationships are being formed.

Where is this going? What does this trend line suggest?

This is a massive, incomprehensibly quick realignment to a horizontal, nonhierarchical, nonstratified point of view. The commons is growing at an incalculable speed as shared resources emerge and disperse both efficiently and at no cost. Our deep desire to feel respected is transforming into information-sharing behavior, not unlike the aboriginal potlatch. Instead of seeking conspicuous consumption and hierarchical control, he or she that accumulates seeks to share.

What is occurring is profoundly aboriginal yet astonishingly modern as we each behave as part of a massive, interconnected whole with no mythology, no deity and no rituals that confuse the metaphor with that which the metaphor represents. We are each reveling in the benefits of life lived with a small band or tribe with no hierarchical barriers to communication, except we are doing so with thousands. Each individual is in his or her own customized community, with deep shared beliefs that could be described as a reverence for process.

God, now, truly has no name.

Where is Twitter heading? We are speeding toward behavior that takes into consideration the wider community, a wisdom of the masses that makes understanding available at no cost. Twitter is not the only vehicle on this highway. Facebook, Digg, Delicious, Reddit, Stumbleupon, Flickr and Youtube are all breaking down walls.

Twitter is the crack that is splitting open an individual's belief that he or she is alone and can have little effect or influence on the world. Mainstream media's reality that life is frightening and we are helpless to intervene will feel strangely anachronistic. Frames of reference that engender change and transformation will feel familiar. Don Juan showed Carlos how to shift perception. Our perception is being shifted by Twitter and its companions, and our perception will be shifted by what follows. The trend is clear. With social media we are focusing on the now.

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Right now, Twitter, Facebook and the others are enhancing communication by increasing the number of people we are in contact with every day while seeking to make those communications clear enough to be useful. We are provided more and more effective sorts, functions and information enhancement features. Youth trained in multitasking transition quickly to new applications. Older folks aren't seeing the advantages of letting go of what they experience as a more intimate, personal experience characterized by fewer contacts.

Developments using Twitter in Iran underline the difficulties of the medium when it comes to integrating or synthesizing information. The wisdom of the crowds is marginalized when the crowd is looking for high-quality information, and all it has is agreement. Twitter and social networking media are failing to offer insight. The reason for this is that the applications are not tracing the movement of information in real time, tracking the lineage of ideas as they move across the medium. The applications are not noting when ideas evolve nor are they paying attention to the identity of the individuals who are present when a new

idea emerges. Furthermore, they are not indicating the individuals who are instrumental to an idea's propagation.

This is not science fiction. Now that memes, or words representing specific thoughts or concepts, can be traced as they spread across a network of users, those memes can be followed in just the way that in biological evolution we can track the evolution of species over time. With Twitter or a Twitter-like application, we can not only trace the evolution of ideas, we can put into the hands of users an ability to conduct searches for these ideas and their particular evolutionary trajectories. In other words, users can request reports in the way that we now conduct a Google search, reports that track the speed, span, depth and breadth of ideas as they move across the web.

For example, in Iran, let's say the conversations that citizens are having regarding the exact kind of administration they would like to see are integrated with where in the country people are congregating with those opinions, who the individuals are that are instrumental in the distribution of those ideas, how fast the ideas are spreading and how many degrees of separation are being generated at what rate. Imagine anyone being able to issue a report collating that information, using that information to draw conclusions, conclusions fed back into the idea distribution network to be able to be traced for their effect.

The result would not be the kind of chaos observed just after the elections but an automatic, lightning-fast, dramatic realignment based upon high-quality, real-time information available to anyone who wants it. This is the equivalent of nature conducting its usual healing in an area devastated by catastrophe. With countless species in close communication with one another and using the information-sharing channels characteristic of natural systems, unique integrations can emerge as a result of adjustment to new conditions.

For this to work in society, as in nature, there can be no hierarchy. Every person in the system gets access to the reports that offer insight into the nature of the information. Now each of us uses "search," but in the direction we are going, there will be a second level, a metalevel, where each of us uses "report." At this level, the wisdom of the crowd can become conventional wisdom, investing every individual with enhanced understanding, not just enhanced communication.

There is a not so subtle change that accompanies this shift in perspective, this embracing of the metalevel of systems operations. This change is a change in identity. As we as individuals begin to understand and embrace a viewpoint characteristic of the way many individuals experience the evolution of information, the identity shift that the young in our communities are experiencing will receive an exponential boost.

Observe that the young are now members of communities, online social networking systems, several orders of magnitude greater than anyone not online. This is having a profound effect upon how we experience ourselves as individuals. Our peer groups are now far larger, more unique and often self-selected; they are not inhibited by geography. Our identities are shifting. We are voluntarily participating in that process.

Consider this ability to romance the wisdom of the crowds so that this understanding becomes easily accessible with the possibility of being further influenced. Now consider this effect upon individual identity. The commons will become common. We will not be able to think of ourselves without considering others. We are talking about a feminization of society.

Social networking does not just have to be only about communication. Social networking can also be about integration.

Where there is integration, there is a shift in identity. Social networking can change who we think we are.

26
Shared Identity

> The prevalence of twilight-state thinking, our very susceptibility to the condition, argues for its [drum dance] evolutionary importance. In extreme cases it results in pathology, derangements and delusions, persisting hallucinations and fanaticisms. But it is also the driving force behind efforts to see things whole, to achieve a variety of syntheses from unified field theories in physics to blueprints for utopias in which people will live together in peace. There must have been an enormous selective premium on the twilight state during prehistoric times. If the pressures of the Upper Paleolithic demanded fervid belief and the following of leaders for survival's sake, then individuals endowed with such qualities, with a capacity to fall readily into trances, would out-produce more resistant individuals. (Pfeiffer, 1982, p. 213)

In physics, there is the phenomenon where the closer a traveler comes to the speed of light, the more separate one's "time" becomes from the traveler's place of origin. Einstein imagined time while riding a beam of light as if it were a train and concluded that time is relative.

In the physics of biology and social change, identity is a variable that, like time, can change. What is necessary to be able to trace transformations in identity is a model of biological and social evolution that embraces consciousness, or awareness, as a default feature of the system. This is quite different from our present predilection to presuppose that the underlying system does not exhibit consciousness or awareness. Note the works of contemporary, respected evolutionary psychologist Dawkins and philosopher Dennett (Gould, 2002). There is an assumption built upon an allegiance to natural selection being the only necessary process to drive evolution (Elsdon-Baker, 2009). That

assumption is that because god is not necessary for evolution, god does not need to exist. Both Dawkins and Dennett are atheists (McManus, 2006; McManus, 2007).

> The experience of dancing constitutes something more than a body in motion. There is a release and a replenishment of psychic energy that leaves one with an oceanic feeling of freedom from which all constraint has fallen away, in which the free play of the emotions in disciplined response to the music has its way. One is infused with a lyrical joy. Little wonder that such feelings have been perceived as reminiscent of the nurturance and protection of the prenatal and infancy stages. However that may be, and whether one dances by oneself or with others, it is the positive reinforcements that one receives from this poetry of motion, this feeling of being in tune with the universe, that is so uplifting and constructively beneficial. It would be difficult to think of any activity of greater therapeutic value. (Montagu, 1989, p. 192)

I'm not talking about making god part of the equation. I'm suggesting that there are effects when one presupposes that consciousness exists.

Identity is changing. And, like the rider on a light beam, we have a difficult task to evaluate the relativistic nature of our experience without access to an alternative landscape. We need someplace to place our feet.

"Instant speeds abolish time and space, and return man to an integral and primitive awareness" (McLuhan, 1964, p. 152).

The shift in awareness is not just a shift backward, as McLuhan (1964) proclaims. Yes, a powerful feature of this identity shift is one where the commons becomes highly valued and contribution to the community is revered. A feature of aboriginal consciousness is a definition of one's self as a member of a community. Yet, something new is being engaged. The communities of our youth are far more than the few people in a local tribe. Hundreds, if not thousands, of self-selected individuals, folks connected to massive self-selected networks of their own, are coming together.

> At present the mechanical begins to yield to organic unity under conditions of electric speed. Man now can look back at two or three thousand years of varying degrees of mechanization with full awareness of the mechanical as an interlude between two great organic periods of culture. (McLuhan, 1964, p. 152)

Speed transforms. Eliminate space and time as we are doing now in our massive, horizontal, transparent, barrierless social media relationships and we eliminate features of our own identity. At the same time that we are individually selecting the participants in our unique social universe, we are also universalizing our experiences by propelling individual experience into a shared space. We each are becoming artists of our individuality, relying upon the medium of our friends. We are painting that which makes us unique with colors characteristic of the features of electronic allies.

As McLuhan (1964) puts it, "As the speed of information increases, the tendency is for politics to move away from representation and delegation of constituents toward immediate involvement of the entire community in the central acts of decision" (p. 204). We are moving at the speed of light away from the society of alienation toward an online community characterized by integration. Whereas before we featured an identity that focused on the separateness characteristic of an experiential model that emphasized only arbitrary interconnection, we are moving into a new presuppositional matrix that is characterized by shared identity. Everything changes. Politics will transform to reflect a populace that assumes an ability of individuals within communities to influence outcomes. Evolutionary theory will adjust to embrace features of life and society characterized by environmental influence, integration and systemic wholes.

> A newspaper headline recently read, 'Little Red Schoolhouse Dies When Good Road Built.' One-room schools, with all subjects being taught to all grades at the same time, simply dissolved when better transportation permitted specialized spaces and specialized teaching. At the extreme of speeded-up movement, however, specialism of space and subject disappears once more. (McLuhan, 1964, p. 346)

That feature of society where professionals control information is an aspect of society that is coming down (Benkler, 2006). From academicians to traditional media practitioners, the proliferation of the horizontal impetus demands that information be free. Eliminate barriers and you eliminate the commodification of information. As personal experience features shared experience, our identity shifts to both an aboriginal and transaboriginal space. In effect, each of us, reengaging our inner aboriginal, also becomes the god of aboriginals, an experience that feels like access to almost infinite information.

Einstein discovered time is relative. So is consciousness. It is necessary to presuppose that consciousness exists to be able to observe it changing. Our children are transforming before our eyes. Identities are shifting. We're going to need a new word for "god" to be able to understand what we are seeing. There is no longer a need for mythology to illuminate. We only have to believe our eyes.

~

"The classified ads (and stock-market quotations) are the bedrock of the press. Should an alternative source of easy access to such diverse daily information be found, the press will fold" (McLuhan, 1964, p. 207). Marshall McLuhan (1964) studied the effects of speed and time on social change. One of his seminal insights was that media mold how we perceive the world, not only by the content that is distributed, but by how specifically media enhance our ability to access information.

It has become evident that the media are about politics. How we communicate influences the distribution of power and authority. More powerful than any political manifesto is the way that the words might be conveyed.

There are three foundation, democratizing power centers. Education controls the ability for an individual to synthesize information. Voting integrity empowers an individual to act upon the information. Media enhance access to information. With fundamental transformations in media, there is a boost in education and voting integrity.

What we are observing now is an exponential increase in the speed

and quality of information distribution (Benkler, 2006). Everything is changing as a result of this transformation.

Theorists Shirky (2008), Rheingold (2002) and others describe the result of barriers coming down with the placement of high-quality resources, such as cell phones and information access, with the formerly disempowered. A staggering upsurge in creativity results with the belief that an individual can make a difference (Benkler, 2006). High-quality information can become ubiquitous when it is observed that a system can encourage an egalitarian distribution of high-quality information. When information stops congregating in the hands of the few, the many feel empowered.

But it's also the speed. Information grows stale. The fact that information becomes available in real time to anyone who can profit from its availability means that the horizontal feels natural. Why believe in hierarchy when authority is informed by access to information, and information is quick and free?

Eliminate distance and collapse time and we redefine a foundation principle of human nature. That principle is that there is a difference between being human and being god. We still mostly believe that the difference between being human and being god is important enough that the difference is integral to our understanding of our place in the universe, whether god exists or not, and whatever the stories we have assigned to god might be. This is changing.

There are no atheists in aboriginal society. To be a member of the community is to share community beliefs. We are quickly headed in an aboriginal direction, where society will be characterized by a universality of process. This is a process not unlike a prehistoric band where each individual has access to all community resources. A result is deep systemic integration, not alienation, resulting in an experience characterized by synthesis, not stratification.

If "the medium is the message," then the elimination of space and time does away with defining ourselves by what we do or don't have access to. Which stories we assign to god or whether he or she exists becomes secondary to the experience that we are not separate. Eliminate space and time and you eliminate most conflict. We are talking about the de-alienation of society.

It will take some time for education to catch up with information distribution and provide an ability to evaluate and form conclusions. Voter integrity will perhaps come faster as it becomes relatively easy to generate double checks by a grass-roots system that combats those places where authority still seeks to congregate. In the meantime, prepare for the wildest ride a species can engage in. After having achieved an ability to be alone, be separate, feel alienated, think thoughts and question authority, we are now being introduced to the equivalent of social hallucinogens. We are being introduced to no time, no space.

This has also been called the eternal now.

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Thomas S. Kuhn (1962) in his *The Structure of Scientific Revolutions* describes the way that science textbooks are written that results in the destruction of student abilities to understand how science evolves. Textbooks are written from the perspective of the current paradigm. The history of a discipline is told as if all discoveries unfolded along a path leading to contemporary insights. Left out of textbooks are the unique world views retained by the succession of paradigms. Past unresolved, nonintegrated anomalies get discarded as the story of the current paradigm is told. Anomalies are the doorways to revolutions. With old, unintegrated anomalies ignored, science students are inducted into a society with secrets. Disciplines become amnesiac. Individuals within a discipline don't know what they don't know.

A very peculiar thing is happening to time and space. We are experiencing an elimination of time and space in societal relations. As individuals, we are experiencing a shift in identity.

Several hundred years ago, we had no watches. In Western society, a vague sense of linear time accompanied those with access to resources. They could tell the time. For the rest, church bells bonged out the hour.

Fifty years ago, we all had analog watches that told time within a couple of minutes. Periodic synchronization was required. Digital watches emerged popularly in the 60s. Synchronization was still of-

ten periodically required. Nevertheless, time had become more linear, digitalized, refined.

With cell phones, time has become exact. Everyone is on the same time. In addition, space is collapsing. We call each other while approaching rendezvous, experiencing each other's presence before sensory confirmation. Being on time at a particular place becomes a relative concept because we can communicate from anyplace as we seek to share the same physical space. An exact meeting place is not required when both have phones. We just talk as we get closer.

We are moving back toward an aboriginal condition characterized by relative time and place as technology breaks down the barriers of identification with a physical form. Not only have our senses been expanded by technology, but so has our experience of time and space.

Marshall McLuhan (1964) describes the effects on individuals and societies when media encourage seamless communication. A result is the breaking down of barriers and a shift in personal identity. It becomes more difficult to experience life as isolated and alone.

Thesis: Aboriginal experience of time and space as nonlinear, relative and socially centered. Antithesis: Modern experience of time and space as linear, exact and individually centered. Thesis: Emerging experience of time and space as nonlinear, relative and trans-socially centered, mediated by technology.

Tracing changes in sense of time and space and shifts in personal identity are difficult to do when the current paradigm mostly chooses to exclude consciousness from discussions. Consciousness is not measurable, so we will not include it in equations. Consciousness, defined as identity shifts in space and time, goes unremarked as consciousness transforms.

In perhaps every way that matters, the future and the present are also the past. Unknown patterns become understandable when we trace their history. Shifts in consciousness begin to make sense when we return from explorations of the past. An adult is informed by childhood, technology by aboriginal relations, a science discipline by a study of its roots.

When Kuhn (1962) described how the transformation of science disciplines is inhibited by textbooks and teaching protocols that hide

seemingly unrelated anomalies transcended by current paradigms, he also described how we hide from ourselves features or patterns in the evolution of biology and society. Whereas biology textbooks don't note many of the several competing biological evolution paradigms of the nineteenth century (Kuhn, 1962), making invisible alternative ways to view the world, in society we don't note changes in consciousness or identity because these changes do not seem to have social or economic repercussions.

Milton H. Erickson, the hypnotherapy innovator and theorist, observed that it was often far easier to achieve a targeted change for a client coming to him with a specific distressing symptom if the change was made without the client being aware that the symptom had been addressed (Erickson & Zeig, 1980). Erickson would work out a contract with the client's unconscious and make a deal that the client's conscious would not be aware of, which would result in the presenting problem going away.

Erickson was intimately aware of levels of identity and the robust power that a model of consciousness could afford. Presupposing unconscious awareness and intention, Erickson was able to negotiate transformation. Erickson communicated with a person's unconscious, using the rules that the unconscious was fully engaged in, primary process, with one time, one place, no opposites (Erickson & Zeig, 1980). This was Freud's discovery (Bateson, 1972) regarding how very young children, animals and the unconscious experience the world. This is also the ancient human aboriginal's world. One time, one place, no opposites.

It seems that changes in science and society are accompanied by an Ericksonian-like amnesia (Erickson & Zeig, 1980). Transformations occur but they seem to be characterized by an almost deliberate choice to not note what has been left behind. Perhaps it's time we become our own hypnotherapist and contract with the past to not only reveal connections to the present, but to find out what is necessary to make it possible to be aware of what has been left behind. No more secrets. Let the anomalies be revealed and discussed along with the discarded paradigms. Let society's changing relationship with itself, its evolving sense of time and space, be the subject of conversation.

Our identity is shifting. We have the opportunity to be aware of that shift. There is structure to the personal, societal and biological shift we are in the middle of. It begins with discovering they are all the same.

27

Puberty and Diet

> Onset of puberty is usually considered to coincide with the last major step in brain development: the elimination of some 40% of neuronal synapses. Mean pubertal age has declined by some 4 years during the last 100 years. There is a relation between age at puberty and body build, and between body build and mental illness. The difference in body build between schizophrenia (S) and manic-depressive psychosis (MDP) is similar to that between late and early maturers . . . . Maturational irregularities are most likely to occur at the extremes, and it is suggested that abbreviation of the regressive process may have led to persistent redundancy of neuronal synapses in MDP and that prolongation of the process past the optimal has yielded an inadequate synaptic density in S. (Saugstad, 1989, p. 156)

The environment can have radical effects on the speed and timing of maturation at the societal scale.

Over the last 100 years, the timing of puberty has dropped four or more years (Saugstad, 1989; Badcock, 1991). The dramatic increase in resources in the form of protein, carbohydrates and fats makes it possible for humans to reproduce sooner to create more progeny to take advantage of the bounty. This is a naturally selected biological response. Baboons in Africa, feasting on human food refuse, experienced an almost immediate drop in pubertal timing in one generation (Sapolsky, 1998).

Careening into the twenty-first century, cultures addicted to unrestrained consumption are now facing an increasingly limited supply of resources. Environmental issues such as global warming are forcing us to restrain carbon output, compelling a clamping down on consumptive lifestyles. Just as an increase in nurturing foods can force an earlier

physical maturing (Sapolsky, 1998), at the societal level a decrease in necessary supplies is encouraging an acceleration in understanding.

But maybe not. Things may not be as they seem.

Human puberty arrived literally a year or more sooner with every generation in the twentieth century (Saugstad, 1989; Badcock, 1991). Brain growth was curtailed a little bit each time. For each individual so affected, the final stage of neurological development was cut short (Saugstad, 1989). The testosterone surges of puberty prune synapse growth when this powerful hormone surges through the body. Childhood dies. What else have we been losing?

We have been eating like there is no tomorrow for 100 years, reaching puberty faster (Badcock, 1991) to have more children to ensure as many descendants as we can. Along the journey, we dropped the seemingly unnecessary baggage of aesthetics, appreciation, gratitude and sensitivity to the nuances of the interconnected nature of experience.

The last major step in our species' evolution was that step where we crossed the line to god. One of my definitions for "god" is a vast, incalculable, unremitting, deep appreciation for everything that exists. That feature was the feature we last evolved, the one that made us "human," when we became self aware. A thing that perhaps additionally compelled us to dance, sing and make stuff up. If modern society has been characterized by "alienation," we can uncover and discover the roots of that loss with the disappearance of the last stage in our species, and in our personal evolution.

Consider that many of the addiction problems in contemporary society are a direct result of a drop in puberty making inaccessible experiences of feeling part of something larger than the self.

Perhaps it's time we changed our diet.

Whereas eating everything we can caused us to physically mature faster, the emerging scarcities of the twenty-first century will compel us to mature more slowly. It is by reaching puberty later in our lifetimes that we access the full cerebral orchestra of instruments pre-prepared to fill the world with music. The late maturing versions of our brains have designed us to be artists and stewards. Eating wisely we become wise. The world is telling us that the time for wisdom has arrived.

Abundance can lead to ignorance, scarcity to love. Still, we don't have to be starving artists. Eating wisely would be a start.

28

Neoteny Not Teleology

> Human evolution has emphasized one feature of this common primate heritage — delayed development, particularly as expressed in late maturation and extended childhood. This retardation has reacted synergistically with other hallmarks of hominization — with intelligence (by enlarging the brain through prolongation of fetal growth tendencies and by providing a longer period of childhood learning) and with socialization (by cementing family units through increased parental care of slowly developing offspring). It is hard to imagine how the distinctive suite of human characters could have emerged outside the context of delayed development. This is what Morris Cohen, the distinguished philosopher and historian, had in mind when he wrote that prolonged infancy was "more important, perhaps, than any of the anatomical facts which distinguish homo sapiens [sic] from the rest of the animal kingdom" (1947, p. 174). (Gould, 1977, p. 400)

Teleological interpretations of societal transformation (Barrow & Tipler, 1986) conflict with the reductionist zeitgeist (Gould, 2002) that demands that consciousness not be considered as a variable when exploring biological or social evolution because consciousness cannot be measured. To suggest that history, as it bridges from the past into the future, follows a deliberate path is not a useful conjecture if we seek an understanding of structure and process rather than bowing to the intentions of an outside force.

If teleology has structure, is it still teleology?

Many nineteenth-century theorists focused on a specific process as they sought to understand the dynamics of biological evolution and its connection to individual ontogeny. Ernst Haeckel was a champion of heterochronic theory, or the study of changing rates and timing of mat-

uration and/or development when species and individuals transform (Gould, 1977). Neoteny is one manifestation of one of these processes. In neoteny, the features of the young, even the embryonic, manifest later and later in the maturation of descendants (Gould, 1977).

Neoteny is not teleology. A process that prolongs or extends the features of an infant into the characteristics of an adult does not imply the deliberate or intentional manifestation of specific qualities in a future time. Biologically, neoteny can be understood to be the result of specific selective processes (natural selection, sexual selection, Lamarckian selection) upon maturation rates, mediated by changes in a mother's testosterone and estrogen levels.

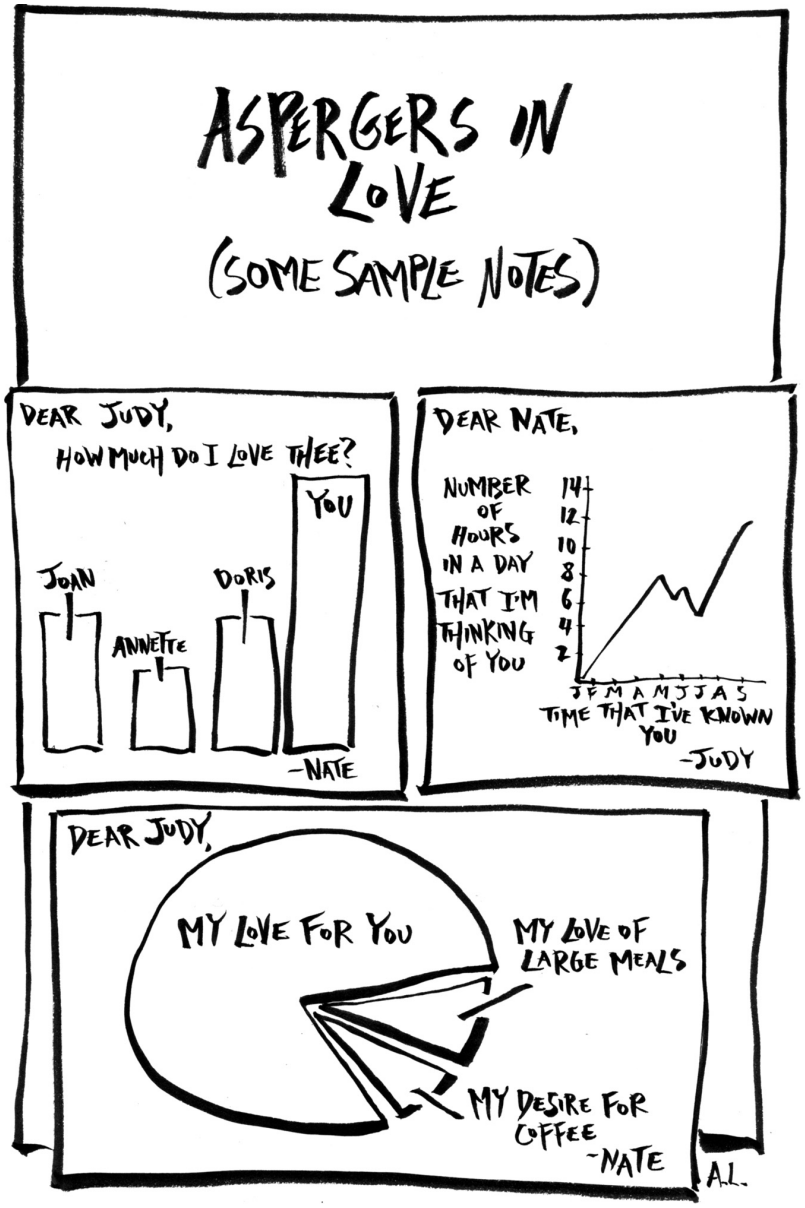
Even though neoteny and acceleration (Gould, 1977) are not teleology (Barrow & Tipler, 1986), both do a very good job of simulating a teleological interpretation of societal change when one observes the effects of neoteny or acceleration on societal transformation. As we observe society over time, it looks like there is an inherent purpose or final cause, a specific direction that we are headed. What we are observing are the heterochronic processes called neoteny or acceleration, thought to be only biological dynamics. Neoteny, at this time, drives the evolution of society, though both neoteny and acceleration are in play.

The ongoing manifestations of early ancestor stages of society in later descendant states look a lot like a teleological or spiritual interpretation of history. Just as in biology, where a trajectory can be estimated of how a species will transform with time, in the study of society, societal neotenous transformations can be predicted based upon the features of early stages of the individual and early stages of society. (For acceleration transformations, observe hierarchy, division, segregation, stratification, secrecy and stability.)

Understanding neoteny and acceleration, we can predict the future.

Intuiting the future is about exploring our beginnings. Studying the embryo, the infant and the child while exploring aboriginal tribal customs, structures, processes and priorities are steps that offer insight into what we are becoming.

Society is biology. They are not just connected. They are the same.


ASPERGERS IN LOVE
(SOME SAMPLE NOTES)
DEAR JUDY,
HOW MUCH DO I LOVE THEE?
JOAN
ANNETTE
DORIS
YOU
-NATE
DEAR NATE,
NUMBER OF HOURS IN A DAY THAT I'M THINKING OF YOU
14
12
10
8
6
4
2
J F M A M J J A S
TIME THAT I'VE KNOWN YOU
-JUDY
DEAR JUDY,
MY LOVE FOR YOU
MY LOVE OF LARGE MEALS
MY DESIRE FOR COFFEE
-NATE
A.L.

VI Autism

29

Autism and Evolution

> This broad category [developmental learning disorders] principally includes developmental dyslexia, stuttering, delayed speech, childhood autism, and hyperactivity (CL, p. 83), and Giles de la Tourette syndrome should probably also be included (CL, p. 83). These conditions are linked by having an excess of males, a 'rather similar pattern of inheritance' (CL, p. 84), and increased personal and familial left-handedness (CL, p. 84; Bishop, 1983; Boucher, 1977; Colby & Parkinson, 1977; Parac & Coren, 1981). (McManus & Bryden, 1991, p. 242)

Central to this feminine interpretation of evolutionary theory, a theory of both biological and societal evolution that describes the relationship among maturation rates, testosterone/estrogen levels, the environment and social structure, is an understanding of autism as a social condition, or what could be described as an evolutionary condition, with specific causes.

Embracing evolution as a process that unfolds at the biological, social, ontogenetic and individual levels while interpreting autism as a social or evolutionary condition displaying connection to those four scales provides a number of places to gain perspective regarding how the condition emerges and specific interventions that may enhance the lives of those that are autistic.

For example, primary process (Bateson, 1972) is a form of consciousness evidenced by the very young, the unconscious, each of us when sleeping and our evolutionary forebears. Describing autism and Asperger's as conditions featuring aspects of primary process, Baron-Cohen's (1995) mind blindness approached from a slightly different direction, we gain insight into autism when exploring the other scales

that primary process applies to.

Directly related to primary process is cerebral function (Bateson, 1972). By understanding lateralization and the relationship among lateralization, primary process and split consciousness, further understanding of autism is available.

Connected to an understanding of lateralization are the effects of testosterone and estrogen (Geschwind & Galaburda, 1987). These two hormones not only hypothetically inform consciousness ontogeny, but determine social structure when taking into consideration environmental influences. This work hypothesizes that autism is directly related to the influence of testosterone and estrogen and what in the environment influences those hormones.

Developmentally, narcissism is contiguous to creativity. It is no mistake that so many with Asperger's display a unique ability to marshal into existence that which was not evident before (Baron-Cohen, 2008). The internal focus featured by those with autism and Asperger's, often accompanied by a difficulty interpreting the internal experience of others (Baron-Cohen, 2008), is closely related to early ontogenetic developmental stages. Creativity and narcissism are both closely connected to autism and Asperger's. In addition, obsessive personality disorder and borderline personality disorder are both related either directly or through family of origin.

To understand autism, it is necessary to understand how humans evolve and have evolved. This Orchestral Theory of Evolution is a theory, or story, that offers a model for creating an opportunity for intervention in the lives of those whose minds are different from the current convention. Assumed in the interventions is the understanding that if the current environment more closely approximated the social and hormonal environment of our evolutionary forebears, those exhibiting consciousness conventions retained by our evolutionary forebears would become less dissociated, less obsessed in nonsocial fashions, less isolated, more able to form bridges to contemporaries.

What it may take to understand autism and intervene in ways that enhance the lives of those that are autistic is a new theory of evolution. Consider that if we had a theory of evolution that generated a medi-

cal model that offered effective interventions, then whether the theory were true or not would not be relevant. What matters is that a theory be useful.

30

Cause 1: Social Structure

> However, Moffat and Hampson (1993) have found that salivary testosterone levels are significantly lower in left-handers than in right-handers. While circulating testosterone levels in adults may not correlate well with fetal exposure to testosterone, these data provide suggestive evidence against the Geschwind hypothesis — one would expect higher, rather than lower, levels of testosterone in left-handers. (Bryden, McManus & Bulman-Fleming, 1994, p. 151)

There are many ways to kill a dragon. I counted several hundred strong-man dragon interventions in the almost one hundred books I read when I was snake-charmed by the subject (e.g., Campbell's 1964 *The Masks of God: Primitive Mythology*). Courage, strength and cleverness were the qualities looked for in a dragon-vanquisher (Campbell, 1964). Many battles led to happy endings where the victor gained a wife (Campbell, 1964).

Myths and legends are a little like spring garden catalogs, offering pictures of the ways a man can gain a mate along with instructions to society and its women on how to best encourage the man's strong features. Our catalog of stories for the last few thousand years has offered guidance for the families of the women on how to pick strong, protective men for their grown-up little girls. When women began to pick their own husbands, they sought men with qualities that society respected, men with strength and streaks of independence, men who could be relied upon when dragons reared their heads.

Gilgamesh slew a dragon-like creature, a stand-in for the goddess and the followers of the goddess religion, when records of these stories first emerged. Not just the Indo-Europeans, but Semitic, Asian and aboriginal peoples revel in these tales of acts of courage in gaining honor and a wife (Campbell, 1964). Not incidentally, dragon slay-

ers were crushing symbols of the old societies, the demonized serpent and the social structures that these symbols represented (Eisler, 1987; Gimbutas, 1989).

It has been hypothesized that in ancient goddess cultures, children were often raised by mothers and mothers' brothers because they frequently had no idea who their father really was (Eisler, 1987). Women controlled procreation. The exchange rate for acts of valor was depreciated by the fact that the man received no family in exchange for his courageous actions (Eisler, 1987). To achieve the opportunity to have children, men had to impress the women in other ways. Women were not looking for the high-testosterone guy who could fend off other tough guys, collect lots of stuff and make sure his wife did not dally around while she took care of the kids that he was sure were his own. Women were not looking for providers.

I have suggested that before the Indo-Europeans, be it serial monogamy, no-known-father promiscuity or a combination of the two, if a man sought a mating opportunity, he would have to dance his way into her heart. It is back when the women were strong and the men were good-looking.

Well, those days are back again.

In just a little more than a single generation, there has been an extraordinary transformation in the criteria that a woman uses to pick a mate. We'd have to go back 6,500 years, before the Indo-Europeans came barreling out of Southern Russia, to see anything like what has emerged of late. As noted earlier, a host of factors have contributed to the transformation, including high divorce rates, high percentages of women employed in the work force, women with higher educations, increased leisure time, fewer children, children not dying of diseases, women not dying in childbirth and having children later in life. These are all factors contributing to a resurgence in an autonomous, self-assured female population confident that goals can be achieved without relying upon a dragon-slayer husband.

Add to that how few dragons there are left to slay. Strength and cunning are little needed in modern society, certainly far less than when life was arbitrary, short, cruel, brutal, etc. Many of the most successful men today are dancers of the mind, pattern manipulators, technical specialists, men who can find ways to be paid to encourage cooperation.

Women are rejecting macho, seeking mucho. Mucho attention. What women want now is a man who offers a better quality of life in the form of a man who can contribute to her feeling loved and strong.

Hence the emergence of the autistic.

I have hypothesized that high testosterone females mating with low testosterone males created the foundation for matrifocal society, the goddess cultures. Vanquished for several thousand years, this societal hormonal constellation is making a major, sudden comeback. High testosterone males mating with low testosterone females, though still a powerful current in contemporary culture (visualize Republican and conservative Democrat), is a current on the wane. Three forces are converging, creating an environment where the autistic are returning, except that the world is not exactly prepared for their return.

High testosterone females produce maturationally delayed, low testosterone males (Geschwind & Galaburda, 1987; Schatzki, 2010) and maturationally accelerated, high testosterone females (Geschwind & Galaburda, 1987). Maturation rate is determined several weeks before birth and is based upon the mother's hormone levels. This work hypothesizes that male maturational delay, in combination with other variables, can lead to autism. I also hypothesize that for females, maturational acceleration can have the same result.

Choosing our mates in an ancient fashion draws from the past, favoring types of individuals with physiological/neurological features born perhaps over 100,000 years ago. Our challenge and opportunity is to provide an environment where those features can mature.

It's time we stop slaying dragons and make these early serpent gods our friends.

31

Cause 2: Forebear Features

> Bryden mentions only studies in his review of research directly linking T and cognitive abilities, namely, a study by Hassler (1991) reporting decreased levels of salivary T in male musical composers and increased levels of T in female musical composers, and a study by Christiansen and Knussman (1987) showing that, in college-age men, T levels correlated positively with spatial relations and negatively with performance on verbal-sequential tasks. The latter study is unusual in that there have been several studies showing better spatial performance in higher-androgen young women and lower-androgen young men, compared to their same sex counterparts (Gouchie & Kimura, 1991; Moffat & Hampson, in preparation; Shute et al., 1983). One interpretation of these findings is that, across sexes, there may be a nonmonotonic relationship between T (or its metabolites, which have not been measured directly in any of these studies) and spatial performance, with optimal performance occurring in the middle range of T values, closer to the lower end of the normal range of T for young adult males. (Hampson & Moffat, 1994, p. 257)

The ability to send our children back in time is an ability all of us have. This ability has to do with how we choose a mate.

It has been estimated that our lineage of homo departed Africa around 80,000 years ago. From there, the various branchings of humanity began. There is evidence of overlap with Neanderthals in Europe, but there is no certainty of conjugational relations (Mithen, 2006). Regardless, as bands and then tribes grew separated by greater geographic spans, the last common descendant among diverging lineage threads grew farther apart in distance and in time.

Academics have hypothesized several reasons that humans left Africa. I would suggest that robust language facility had no small amount to do with the compulsion to explore. We might conclude that language was well established because across the planet, most cultures display a relatively small number of left-handers, anywhere from 2 to 12 percent (Annett, 2002). This number suggests that those that left Africa used the same brain we right-handers have today–larger left lobe with smaller corpus callosum–as opposed to the alternative, earlier left-hander model of both lobes being similarly sized with larger corpus callosum (Annett, 2002).

We might also consider whether those myths and stories that seem to have roots in cultures all across the world might have been carried from their continent of origin. In other words, we might call those bands and tribes of Africa the serpent people. Aboriginal matrifocal societies across six continents worship serpent gods (Campbell, 1959).

Charles Darwin was a pigeon fancier (Darwin, 1859). He tracked in detail the lineage of breeds, concluding that the human-dictated evolutionary trajectories of these birds satisfactorily informed an understanding of how nature compelled an evolutionary transformation (Gould, 2002). Breeders selected specific pigeon traits and watched them blossom into unique characteristics, features often deeply debilitating if the birds were allowed to return to the wild. Nature, Darwin concluded, would select traits with survival utility, not a human predilection for what was visually unique, unless sexual selection was in play (Gould, 2002).

Over 80,000 years, humans found homes and proceeded to breed and play. As concepts of the ideal mate changed with time, lineages diverged as fashions for different looks and behaviors modified with the latest fad. Some peoples in the North preferred the light-skinned mates that stayed healthy soaking up vitamin D (Harris, 1974). Other peoples in the North preferred a chubby mate that stayed healthy with reserves of energy. Skin color, body types, personality characteristics and behavior variations were modified just as pigeons were modified by the breeders seeking novelty (Gould, 2002). The less contact societies had with one another, the more unique these variations could become.

Humans have been breeding pigeons for over 2,000 years (Dar-

win, 1859). It has been almost 2,000 years since some pigeon lineage threads have last had contact with one another (Darwin, 1859). Darwin made an observation. When two pigeons were bred from widely diverging strains, the chicks revealed features of the last ancestor that the parents had in common (Darwin, 1859). In this case, the rock pigeon, which is still a common breed today (Darwin, 1859).

Parents with diverging ethnic threads with little or no lineage contact for tens of thousands of years send their children speeding off into the past. When they return, emerging from the womb with characteristics of both parents, they often carry with them additional features retained by the last common ancestor of the breeding pair.

Breeders often encourage this process of cross-breeding as they seek robust features from the past, seeking hybrid vigor. Breeding separate lines, threads too long divergent, sometimes demands some old genes to provide strength and balance.

Enter the autistic. Misinterpreted as a disorder, autism is a reservoir of human features reappearing to be integrated into a culture deeply in need of strength and balance. Consider which features of the autistic we need most desperately today.

A premise of my work is that there are several causes of autism that are related to changes in a mother's sex hormone levels (Baron-Cohen, Lutchmaya & Knickmeyer, 2004; Auyeung et al., 2009), and furthermore, this process relates to hypothetical changes in testosterone and estrogen levels over the course of our recent (3,000 generations) evolution. We've transformed from a matrifocal, aboriginal, high testosterone/high estrogen female, low testosterone/low estrogen male to the reverse, a high testosterone male, low testosterone female. Various environmental and social effects propel our children backward hundreds, sometimes thousands, of generations. When sent too far back, their world becomes again one characterized by primary process (one time, one place, no negatives; Bateson, 1972) that in modern times manifests as autism because there are no longer the ancient aboriginal social conventions that serve to bind individuals together within a group. A foundation of communication might be constant rhythm, constant touch, breast feeding for at least 2.5 years (Hrdy, 2009), sleeping through the night with the mother until weaning (Hrdy, 2009),

low-fat, nongrain diets (Hjiej et al., 2008), almost nonstop dance and gestural language (Hewes, 1973; Corballis, 2002) with an emphasis on performance or one-to-many communication similar to a chimpanzee demonstration (Goodall, 1990).

There are other clues to autistic brains fitting the paradigm we are describing. The autistic display perfect pitch a far higher percentage of the time than the nonautistic.

In Darwin's 1859 *On the Origin of Species,* he described the result of mating two lineages of pigeons separated by 2,000 years of separate breeding. Breeders of horses, dogs and other domestic species find that with careful interbreeding of disparate lineages, hybrid vigor can be encouraged by the carrying forward of useful characteristics of common ancestors into the present day.

Consider the following. Humans mating with other humans separated by two thousand generations or more since last connected are encouraging the emergence of features in their children that were extremely useful back when spoken language was brand new, or perhaps when communication was still mostly accomplished by gesture. I would estimate that the children of these marriages would be left-handed a far higher percentage of the time, right-handedness hypothetically emerging later with spoken language and hemispheric differentiation.

Currently, some individuals would have difficulty adjusting to contemporary child-rearing practices, tending to withdraw and to be lost in primary process. Hybrids may not easily integrate into a domestic context. Other individuals would offer an astonishing array of useful features that seem to seamlessly align themselves with us moderns. There are those that are a combination of the two.

We are more than our genetics. What our parents provided is but part of the package. Also there is what we learned while in the womb, epigenetic understandings. Then there are the decisions we made while growing older. Genetics, environment and personal decisions combine to make us what we are and what we become. Nevertheless, how our parents' contributions combine have a powerful effect upon what comes after.

Barack Obama is a hybrid child, a left-hander, a charmer and a deft performer. How much of Obama's skill set comes from characteristics

vital to our ancient forebears? In a matrifocal society, these are features that are deeply respected and particularly useful in procreation. Why are some children provided a set of skills that fit perfectly for our times while others have so much difficulty adjusting?

I don't know. But it does seem reasonable to me that we explore the conditions that might feel most familiar to those emerging among us now who might reveal features characteristic of long ago. A place to begin looking is where our matrifocal, aboriginal peoples are still alive today. Some of those people are still speaking in click languages in Africa (Gibbons, 2009).

Perhaps the oldest peoples of the world, societies exhibiting features of primary process, can offer us insight into contemporary conditions and diseases that we are wrestling to understand.

32

Cause 3: Environment

> The fundamental pattern of the brain thus appears to be asymmetrical, with the same pattern of asymmetries found in most adults. There are, however, influences in pregnancy that tend to diminish the extent of left-sided predominance, at least in the regions involved in handedness and language, and thus secondarily to result in larger regions on the right side. As noted earlier, our hypothesis is that some factor related to male sex, perhaps testosterone or some closely related factor, is the most likely candidate. The net effect of these intrauterine influences is to produce a shift from left predominance to symmetry, and in a smaller number of cases to modest right predominance. (Geschwind & Galaburda, 1987, p. 46)

It could be said that it all begins in the womb. It is even deeper and more subtle than that. Autism researchers such as Simon Baron-Cohen have come to the conclusion that a mother's testosterone levels are influencing the likelihood of autism (Baron-Cohen, Lutchmaya & Knickmeyer, 2004; Auyeung et al., 2009). I formed this hypothesis in 1998 when exploring the work of Norman Geschwind and Charles Darwin. In the winter of 2009 it hit me that estrogen might be integral to womb and early childhood conditions contributing to synapse pruning, influencing cerebral lateralization.

Noting this effect while exploring the impact of sexual selection on social structure provides additional perspective. Observing the relationship between social structure and evolution, one begins to understand that what goes on in the womb can decide the direction we evolve.

Mother's testosterone levels > progeny maturation rate > social structure proclivity > evolutionary trajectory.

Mother's estrogen levels > progeny cerebral synapse timing > social

structure proclivity > evolutionary trajectory.

The higher the mother's testosterone levels, the more likely the male children will have maturational delay and the females maturational acceleration. The males' testosterone levels will be relatively lower compared to boys born from mothers with low testosterone levels (Geschwind & Galaburda, 1987). The females' testosterone levels will be relatively higher compared to girls born from mothers with low testosterone levels (Geschwind & Galaburda, 1987).

I hypothesize that the higher the mother's estrogen levels, the more likely the male children will have maturational delay and less right hemisphere synapse pruning and females maturational acceleration and more synapse pruning. High mother estrogen, low son estrogen, high daughter estrogen. High mother testosterone, low son testosterone, high daughter testosterone. This is our hypothetical ancient aboriginal, promiscuous or serial monogamous, primary process-inclined, dancing, performing, classic matrifocal society (Morgan, 1877).

In current times, when the mother's testosterone and estrogen levels are high, she is propelling her children backward in evolutionary time. Backward in evolutionary time for humans is away from patrifocal social structure and toward matrifocal social structure (Morgan, 1877; Hrdy 2009). Males experience more maturational delay, females more maturational acceleration. A mother with elevated testosterone and estrogen levels (a woman comfortable in a matrifocal society) sends her children on a journey to the society of her societal and evolutionary precursors.

Eventually, we go back far enough in time to when males were first acquiring facility with spoken language. Go back even further in time and females are first acquiring facility with spoken language. Hence the higher number of males exhibiting autism, Asperger's, stuttering and other conditions characterized by maturational delay (Skuse, 2000; Corballis & Beale, 1983; Baron-Cohen, Lutchmaya & Knickmeyer, 2004). Males don't have to go very far back in time, compared to females, to begin wrestling with the origin of speech.

With this premise, one could come to the following conclusions. The older the mother grows, and the higher her testosterone levels (Khaw, Tazuke & Barrett-Connor, 1988), the more likely her male children will experience maturational delay (Schatzki, 2010), her girls maturational acceleration, and the more common autism will be (Schatzki, 2009; Robotham, 2010). The youngest son, conceived when the mother is oldest, should exhibit a number of personality features associated with a matrifocal social structure. One might also consider that the youngest sons would be more graceful than the robust older sons, if there are physiological concomitants to social structure traits. For example, the matrifocal bonobo are slimmer and lighter, with longer legs than their close cousins, the chimpanzee (De Waal & Lanting, 1997).

For the same reason, one could hypothesize that lankiness would be common among autistic males.

Because a mother's testosterone levels rise with her age (Khaw, Tazuke & Barrett-Connor, 1988), if the hormone variation is relatively extreme and she has children across the whole spread of the years that she can conceive, then we might observe an arc of features in her children that would roughly reproduce human evolution over a span of tens of thousands of years.

A mother's testosterone levels can be impacted by a host of other factors, such as smoking (MacMahon et al., 1982), physical exercise, stress (James, 1986), exposure to light (Geschwind & Galaburda, 1987), alcohol consumption (Castilla-Garcia et al., 1987), diet (Schmidt, 1997), touch, etc. For example, if a mother grows fatter over the years, the weight gain will increase her testosterone and sometimes estrogen levels, sometimes radically (Ahluwalia et al., 1981; Hamalainen et al., 1983).

So, though it may seem like it all begins in the womb, consider all those variables that influence hormone levels in the womb. Beginnings become blurred if a multitude of factors influence that beginning. The characteristics of our children may in some cases have as much to do with the mother's uterine environment as her ancestral inheritance.

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One of the patterns that a commitment to natural selection masks

is that evolution can happen extraordinarily quickly, in a single lifetime. Darwin was aware of single-generational change and struggled for an explanatory principle. He called his theory "pangenesis" (Darwin, 1868). According to pangenesis, the body manufactures gemmules that can carry information informing the body of environmental change, which the body responds to, modifying progeny in response (Darwin, 1868).

We call them hormones.

We live in a post-Mendelian age. When a cloned sheep emerges from the mother with fur exhibiting different patterns from her other self, we might take notice. This effect is not what was predicted. With the complete genome mapped and with the realization that things aren't exactly as easy as Mendel suggested, we might consider alternative paradigms.

A mother with high testosterone and estrogen produces males with low testosterone and low estrogen and females with high testosterone and high estrogen (Geshwind & Galaburda, 1987). I hypothesize that the child's maturation speed and timing are determined weeks before birth and are based on the mother's hormone levels. Imagine that the fetus reaches that point, weeks before birth, and the individual's lifelong maturation rate and timing are set. Now imagine that his or her position in evolutionary time is also calculated. What is determined by the mother's testosterone and estrogen levels is the child's position in the evolutionary arc of our species over the last several tens of thousands, even hundreds of thousands, of years.

This trend means, as Frederick Engels (Gould, 1977), Henry Morgan (1877) and several nineteenth-century proto-anthropologists suggested, a return to matriarchal social structures: low testosterone males and high testosterone females.

Ontogeny to some degree reenacting phylogeny. Stages of our ontogeny inform and reproduce the final stages of our social structure evolution.

Autism manifests that recent stage in our unfolding where split-brain modern consciousness emerges and language use bridges over from gesture to speech. I hypothesize that the females were often the leaders of these matrilineal/matrifocal bands (Hrdy, 2009). I suggest

that they wielded authority and were the first to be adept with words. Their brains made the transition first from two lobes of the same size with a wide corpus callosum to brains with a smaller right lobe with less robust cerebral connective tissues. Split brains made them better leaders. They could toy with time. Males continued to be selected for their cooperative, artistic, neotenic tendencies; it was desired that they be dependent upon and comply with the directions of the band. Performance to achieve copulation rather than command to control female procreation was the norm.

With the story we are telling, we'd expect our male and female autistics, our travelers to the past, to evidence complementary opposite features.

I would predict that autistic males (those from families of left-handers, families evidencing maturational delay, not the autism born of trauma) will evidence neotenous characteristics such as smaller jaws, big heads and a post-puberty lanky build (unless provided diets that would hasten the onset of puberty). The literature already suggests that autistic males have far larger brains at least 20 percent of the time (Fombonne, 2003) with two lobes often the same size. The males, of course, should have lower testosterone relative to the autistic female and lower than the standard, nonautistic, right-handed male.

Again, the autistic female is relatively rare compared to the autistic male (e.g., Skuse, 2000; Baron-Cohen, 2008), because you have to go further back in evolutionary time to find females having difficulty with words, with brains not yet split. I would predict that the autistic female would show little neoteny as compared to a nonautistic female. The autistic female should evidence a larger jaw, stockier build and a more domineering disposition when compared to her contemporary sisters. She should reveal higher testosterone levels relative to the standard, right-handed, nonautistic female.

This model predicts complementary opposite characteristics of male and female autistics that mirror the matriarchal social structure that is their society of origin (Hrdy, 2009). When we understand that social evolution, biological evolution and ontological transformation are all about different time scales of the identical process, we can better interpret what we are observing in the now.

One last point, and perhaps it can't be emphasized enough. If indeed estrogen impacts the timing of testosterone surges, in the way that puberty can be delayed in both sexes if there is too little, then embryo, infant and small children synapse timing may be regulated by infant estrogen levels. Too little estrogen, a smaller testosterone surge, and more likely the result will be anomalous dominance (Annett, 2002) or two cerebral hemispheres the same size (a larger brain) and a larger corpus callosum (Moffat, Hampson, Wickett, Vernon & Lee, 1997). What influences estrogen levels may impact the prevalence and degree of autism and related conditions.

33

Cause 4: Childhood Conditions

> Even with small sample sizes, differences were large enough for Meehan to identify a clear pattern. Infants whose mothers lived matrilocally received more than twice as much alloparental care as infants born to mothers living near their husband's kin ('patrilocally'). Care from older siblings was a constant for infants living in both locations. The difference was the extra help provided by an infant's maternal aunts and uncles and especially by its maternal grandmother. (Hrdy, 2009, p. 164)

Central to understanding that an autistic child has neurological origins in a matrifocal society is an understanding of the environmental features that a child with those neurological affinities might demand. This work focuses on a combination of environmental effects and social structures, which influence hormone levels, thus compelling changes in the rate and timing of maturation, which in turn influence the speed and direction of evolution. I've described how environmental and social structure changes can cause the current emergence of neurologies at home in an ancient past. What were those ancients, alive several thousand generations ago, exposed to that resulted in their living lives without the dissociative qualities associated with autism? How were the lives of these ancient aboriginals different so that they created an opportunity for an integration of each child into society?

This work seeks to introduce a theory partner to Darwin's (1859) theory of natural selection. Natural selection concentrates on the power of features that support survival until procreation and the inheritance of those specific features (Darwin, 1859). Variation among them is random, not created by circumstances in a parent's life. My Theory of Orchestral Evolution proposes that what happens in an individual's life is integral to that individual's child's neurology, physiology

and behavior. Social structure and environmental changes encourage an emergence of maturationally delayed and accelerated progeny, an emergence which influences evolution. I also propose that a child with specific matrifocal or matrilineal/matrifocal neurological predilections requires specific child-rearing practices, those engaged in by ancient hominid hunter-gatherer societies. These child-rearing practices break down into alloparenting (Hrdy, 2000; Hrdy, 2005; Lamb & Hewlett, 2005; Konner, 2005), often with a heavy emphasis on the mother's mother (Robson, van Schaik & Hawkes, 2006), and specific guidance on engaging theory of mind (Hrdy, 2009). In a bit, I will discuss other features of ancient matrilineal/matrilocal childhoods that include dance, performance, rhythm, music, nongluten/noncasein diets, constant touch, sleeping all night long with the mother and nearly constant infant-initiated breast feeding.

> Virtually all African peoples who were living by gathering and hunting when first encountered by Europeans stand out for how hard they strive to maintain the egalitarian character of their groups, employing sanctions against bullies, braggarts, or those deemed stingy, consciously keeping social stratification and extreme skews in access to resources or in reproduction to a minimum. (Hrdy, 2009, p. 204)

Consider that for children with ancient precursor neurologies, who have little or no cerebral lateralization, who are born of higher testosterone, higher estrogen mothers, often from families with left-handed mothers or fathers, that it is necessary to *teach* theory of mind and encourage compassion. There are particular ways that current matrilineal/matrilocal aboriginal hunter-gatherer societies guide their young into noticing, assimilating and acting upon the experience of others (Hrdy, 2009). These are ways that members of current society can be behaving toward children born from parents with features that suggest contexts where the autistic may appear. Environment and/or social structure changes alone may not, in many cases, compel the emergence of autistic tendencies. Children growing up in cultures far different from those cultures we evolved in may be introduced to such unfamiliar experiences that autism may only then emerge.

> The more older siblings a child has, engaging (and also perhaps tormenting) her, the better a child does on tests that require her to see the world the way someone else does. On closer examination, however, it turns out that it is not so much the number of siblings that matter as the fact that some are older. (Hrdy, 2009, p. 136)

A recent study (Van Meter, Christiansen, Delwiche, Azari, Carpenter & Hertz-Picciotto, 2010) showed that higher-income parents in California revealed higher rates of autism. It can be estimated that at least part of this is because children of wealthier parents are more likely to receive an evaluation if they reveal delays (Van Meter et al., 2010). Still, wealthier parents often have have fewer children, conceived later in life. Other studies (Shelton, Tancredi & Hertz-Picciotto, 2010) have observed that first-born children and the children of older mothers are more likely to be autistic. The reason wealthier parents may have higher rates of autism may be related to the children often having no older siblings and often being born of older, high-testosterone mothers (Van Meter et al., 2010). Hrdy (2009) offers us a window into the childhoods of aboriginals, which featured constant encouragement to share experiences with others in the context that sharing is essential to be a member of the community. Theory of mind is taught (Hrdy, 2009). If a child grows up in a home with wealthy parents, exposed to few intimate adults, with no older sibling, perhaps maturationally delayed, can a combination of these various factors result in a delay of development of theory of mind?

Central to Hrdy's (2009) thesis that humans evolved in a matrilineal/matrilocal context are the studies that support the conclusion that far higher percentages of children survive to adulthood when a mother co-parents with one or more female allies, particularly the mother's mother. Almost unexamined in studies of autism are the family structures and the presence of alloparents when the diagnosis of autism is in play. Consider that in matrilocal hunter-gatherer societies, perhaps the exact way that humans evolved, not only was it necessary that there be several parents working together to create an opportunity for each child to estimate what was happening in *several* intimate individuals, but that it was necessary for each child to relate in an intimate fashion to several individuals from birth on to access a robust ability to exercise theory of mind (Hrdy, 2009).

> The recognition that a child's survival depended not just on staying in contact with his mother or provisioning by his father but also on the availability, competence, and intentions of other caregivers in addition to parents is ushering in a new way of thinking about family life among our ancestors. Well might anthropologists and politicians remind us that "it takes a village" to rear children today. What they often leave out, however, is that so far as the particular apes that evolved into *Homo sapiens* were concerned, it always has. Without alloparents, there never would have been a human species. (Hrdy, 2009, p. 109)

Consider that it has taken a village to raise a child over the last two million years, and during that time brains were growing at exponential speeds as childhoods were prolonging and neoteny was compelling the emerging of infant features in the behavior and physiological features of adults. Consider that a village is required to raise current autistics, it being necessary that each child be in intimate contact with many different adults. During our evolution, just as theory of mind may have resulted from both an alloparent environment and specific teachings that each should take the experience of others into consideration (Hrdy, 2009), in current times these same two issues may be back in play.

> We failed to consider the profound impact of older siblings, grandmothers, uncles, or the mother's lovers in worlds where more than half of all infants born would starve, be murdered or eaten, or succumb to accident or disease before they matured. Only at the end of the twentieth century, as findings by human behavioral ecologists and sociobiologists started to come in, did it become clear that in foraging societies with high rates of infant and child mortality – societies like those our ancestors evolved in – support from alloparents not only improved health, social maturation, and mental development, it was *essential* for child survival. (Hrdy, 2009, p. 105)

Hrdy (2009) theorizes exclusively from the position that her conclusions need to satisfy the demands of natural selection. She misses both work suggesting sexual selection may be in play (Miller, 2000) and work that neoteny may have an impact (Brin, 1995). By concluding that societies not engaging in matrifocal behavior are destined to struggle to survive, Hrdy (2009) reaches a conclusion supported by natural selection. To have an integral understanding of the hormonal foundation of society, it is necessary that we grasp how matrifocal social structure exhibiting female sexual selection driven by neotenous priorities directly reinforces alloparenting societies that teach egalitarian cooperation.

> To date, the most widely replicated hormonal effects have to do with a drop in testosterone levels reported for men living in close association with pregnant women and for men living with infants after they are born. The more responsive to infants men are, the more likely their testosterone will continue to drop with continued childcare. (Hrdy, 2009, p. 171)

I've hypothesized that low testosterone males were central to the societies that we evolved in. Current hunter-gatherer societies feature fathers spending far more time around their children than any kind of society that followed (Hrdy, 2009). Consider that the kinds of society that Hrdy (2009) is proposing that humans evolved in are societies with males exhibiting lower testosterone levels.

Lower male testosterone levels during our evolution in matrifocal (matrilineal/matrilocal) social structure is a central theme of this Orchestral Theory of Evolution.

If the societies that Hrdy (2009) studies evidence the particular ways that we were raised before brains lateralized for language, and brains today less lateralized for language are often stymied in their efforts to achieve theory of mind, then consider assigning the child-rearing practices of our aboriginal, matrilineal/matrifocal hunter-gatherer societies to current families producing children with less lateralized brains.

Autism is an evolutionary and social condition with several factors combining to create a situation where children exhibiting neurological anachronisms seek very particular environments that mirror an ancient frame of reference. By understanding our social structure of origin and the specific ways children were raised, we offer opportunities to intervene in the lives of current children that may create bridges to other human beings.

34

Brains and Testicles

> I have found the midsagittal area of the corpus callosum to be larger in mixed and left handers, referred to as non-consistent-right-handers (nonCRH), than among CRH subjects (Witelson, 1985). Hand preference is a rough index of the pattern of brain organization. Left handers (by various definitions) have a higher prevalence of atypical right-hemisphere representation of speech and language functions than do right handers and, in general, show a greater degree of bihemispheric representation of verbal and spatial skills (for review, see Bryden, 1988). (Witelson, 1991, p. 139)

When I was exploring the possibility of a human genetic precursor that was random-handed with a larger brain encouraged by a song-and-dance-based matrifocal culture, I hypothesized that if representatives of our ancestors were around today, they would have larger brains and difficulty with language.

The premise is that the exponential growth in brain size through the history of Homo erectus and before was driven by the selection for mates talented in dance. An established biological pattern is that predators have larger brains than their prey. More demanding physicality (it's more difficult to be a predator than to run away) creates a requirement for increased neurological support. Dance may have been a sexually selected physical demand with no ceiling threshold in satisfactory results. Rampant brain growth may have been the result of males competing for the attention of females in matrifocal, matrilineal/matrilocal societies where males that exhibited neotenous characteristics (creative, playful, cooperative) were the most likely males to procreate.

The best dancers had bigger brains. The best way to select for bigger brains over time was to adjust maturation rates and timing to choose males exhibiting neotenous characteristics. This work suggests neotenous males are cooperative males supporting a matrifocal social structure.

When I was first playing around with these ideas, noting that studies reported that our brains were growing smaller in size about 25,000 years ago (Wiercinski, 1979), I surmised that an emergence of patrifocal social structure, right-handedness and a smaller brain might be all related. If this was the case, then there might be representatives of language-challenged, bigger-brained people around. I had worked with autistic children. I investigated the literature for evidence of autistic people having bigger brains.

Autistic people often have bigger brains; twenty percent of the time they have far larger brains, at a 95 percentile (Fombonne, Roge, Claverie, Courty & Fremolle, 1999).

I explored the literature for evidence of other signs.

Chimpanzees and gorillas exhibit the extremes of the great ape social structure. Chimp males have large testicles to be able to produce the prodigious amounts of sperm required to compete to sire a child (Smith, 1984). A female in estrous may copulate with several males in a day (Smith, 1984). Gorillas have small testicles (Smith, 1984). The male silverback controls the females by physically dominating the other males. He can copulate at his leisure, relatively certain the progeny will be his. Less sperm required. I hypothesized that in a matrifocal social structure, balls would have to be bigger than in a patrifocal setup. There was some support of this in the literature in contemporary cultures. Highly stratified patrilineal cultures, as a rule, had males with smaller testes than males with more recent matrilineal connections.

The question was: Did bigger-brained males also have larger testicles? Did ambidextrous males, left-handed males or autistic males–hypothesized to be males with an older genotype from matrifocal societies–have bigger balls?

I was unable to find any studies on testicle size as it relates to handedness, autism or conditions characterized by maturational delay. There was one exception. Autistic males with the condition called fragile X had huge testicles. But these autistic males were a genetic anomaly. But, is this a clue?

Consider that along with the dramatic increase in autistic children, we are also seeing a resurgence of individuals with no communicative impairments that are close genetic relations to people with conditions characterized by extreme maturational delay, or autism. Look for unusually articulate (and often unusually inarticulate), big-brained, big-balled, nonhierarchical, artistic, left-handed pattern manipulators. Or, they may be talented athletes or programmers.

I am proposing that there is a connection between big brains and large testicles, and they are both growing larger in modern times.

35

Narcissism

> Some extreme variants are associated with the deviations of psychological function that we describe as psychosis. These states are seen as boundaries of the distribution of personality variation, including the capacity for language and emotional expression. In particular, those with the earliest manifestations (i.e., schizophrenia, Asperger's syndrome and autism) have the greatest impairments of communication and social ability, and they also demonstrate a failure to develop anatomical asymmetry. In summary, key features of the theory are that the psychoses are disorders of specifically human evolution, arising from variation in the genes controlling hemispheric asymmetry that has led, by the mechanism of sexual selection, through progressive delay in maturation (neoteny) to increased brain size and intelligence. The most readily testable prediction is that the gene for asymmetry (and by implication contributing to predisposition to psychosis) should be X-Y homologous. (Crow, 1995b, p. 24)

I'm slowly coming to the conclusion that many male narcissists are not exhibiting a personality feature born of past trauma. They are natural narcissists basking in the center of attention, comfortable with being on display. Creativity is often a hallmark of their personality. I'm playing with the idea that these self-oriented males are examples of the ancient genetic archetype described in this work, males that often come from families of left-handers. These are the male performers, often playing to gain the attention of a female, not very hierarchically inclined, but very focused on achieving attention. It is no mistake that artists are often narcissists. If the first stage of human development is characterized by an extraordinary surge of creativity with the self being produced from a single cell, then the next stage is awareness of the

self just created. For humans, creativity and self-awareness go hand in hand.

There are several implications.

Autism may be a form of extreme narcissism or an early developmental stage so stretched out as to become one's whole life. Autism theorist Simon Baron-Cohen (2008) has suggested that autism is a too-male brain resulting from too-high testosterone levels in the mother's womb. I would suggest that autism is an example of an exaggeration of the left spectrum, or older genotype, the artist/dancer prototype characteristic of matrifocal social structures. A mother with high testosterone levels, and possibly low estrogen, suggests the female of this older genotype. High testosterone mothers create lower testosterone males and higher testosterone females (Geschwind & Galaburda, 1987). Autism is but the extreme of a narcissistic, creative, low testosterone male of this ancient, pre-patriarchal, random-handed society. Autism does not represent an extreme male brain but an unusually maturationally delayed, neotenous brain encouraged by a mother with high testosterone levels.

Another implication of embracing rather than rejecting the narcissists among us is the repercussion of positively recognizing the evident flood of young male narcissists coursing into society. Their appearance has been accompanied by an astonishing increase in creativity as they interact with the web. I'm suspecting that it is not a bad thing. For example, it is not evidence of a society with regressive tendencies. I'm thinking that it is evidence of societal neoteny with features of earlier stages of ontogeny prolonging into the adult of the species. The forces compelling the neotenization of society are manifesting in increased male narcissism, increased creativity, increased autism and an increase in the number of women comfortable with wielding authority.

In the way that the label "narcissism" has been assigned to the self-enthralled (mostly males, in my experience), there is the label borderline personality disorder that has been assigned to another seeming deviation from a norm. I'm hypothesizing that if narcissistic personality disorders are mostly male, then borderline personality disorders are mostly female. Whereas there is a healthy narcissism, there is also a healthy borderline. That would be the left spectrum, old genotype

woman used to being in command, comfortable with authority at the center of a matrifocal world. These details would suggest that narcissists often mate with borderlines and that left-handers would often be in their families. There is also a suggestion that conditions characterized by maturational delay, such as autism, would be closely associated with these two complementary personality "disorders."

36
Related Conditions

> In the extraordinary closing words of his report on the Schreber case, Freud rediscovers the fourfold parallelism of classical recapitulation: the child, the modern savage, our primitive ancestor, and the adult neurotic all represent the same phyletic stage–the primitive as true ancestor, the savage as modern survivor, the child as a recapitulated adult ancestor in Haeckelian terms, and the neurotic as a fixated child (=primitive) . . . . (Gould, 1977, pp. 158-9)

I've sometimes wondered what a theory of human personality and psychotherapeutic intervention would look like if contemporary psychodynamic theory were based on a theory of human evolution that embraced sexual selection, Lamarckian principles and the influence of social structure on societal transformation. Freud was a recapitulationist (Gould, 1977). Freud believed in a fourfold relationship among childhood developmental ontogeny, human evolutionary stages, a contemporary societal hierarchy of cultures and individual circumstance (Gould, 1977). Freud hypothesized that a child recapitulates or reenacts our recent evolution. For example, he estimated that there might have been an actual prehistorical event where a son killed a father that correlated with the oedipal stage in early ontogeny. Freud's perspective was Victorian and male-centric.

As I have described, humans may have evolved according to a dynamic where females picked males for their ability to evoke an experience of feeling part of something larger than the self, part of a matrifocal, dance-driven tribal culture where a craving for this aesthetic drove the dramatic increase in our brain size. Females picking neotenic, or cooperative, males choose maturationally delayed males whose brains grow bigger over generations as infant features (such as fast-growing brains) prolong into the characteristics of adults. Female brains capable

of interpreting the nuanced exhibitions of males on aesthetic overdrive also experience selection for big brains. This process was runaway sexual selection (Fisher, 1930) in a matrifocal social structure.

The not particularly complementary opposite is patrifocal social structure evolution, which was Freud's and Darwin's world. Developmental models, derived from Freud, have mostly been stripped of their evolutionary origins. The contemporary philosopher Ken Wilber (2000) integrates Freud's developmental model with a more contemporary, recapitulationist frame, but a frame that still does not take into consideration the influence of social structure and sexual selection on human evolution. I am proposing that the examination of a runaway matrifocal, matrilineal/matrilocal sexual selection model for human evolution correlating with individual developmental stages reveals personality "disorders" representing stages in our recent (last ~100,000 years) evolution.

In other words, in the way that autism is an evolutionary condition, not a neurological disorder, narcissistic personality disorder, borderline personality disorders and obsessive-compulsive tendencies may have far less to do with mental diseases demanding intervention than they may represent evolutionary stages or conditions demanding context reorientation.

I'm reorienting psychodynamic theory to accommodate evolutionary theory. Understanding ourselves outside the context of our evolution is a little like conducting psychotherapy without exploring a person's personal past. Our evolutionary origins are integral to understanding our personal journeys. As we walk a person back through childhood to re-engage the resources left behind, we must also be cognizant of the resources natural to their social structure inclinations. Bridging a client to health involves knowledge of what health looks like for that particular person. A domineering, commanding female may fit all the criteria for matrifocal matriarch. Interpreting her behavior as borderline personality disorder may make less sense than seeking a context where her behavior complements her experience. It might be easier for a narcissistic male to achieve a less self-centered, more compassionate perspective if his experience is contextualized by an understanding of his evolutionary origins and an understanding that, for him,

the narcissism is natural, not a defect.

Note that personal trauma compelling the freezing of assets in developmental states also manifests features of the correlated evolutionary stages in the behavior of adults. The thawing of the assets may release attachment to those evolutionary stages. In other words, the manifestations of evolutionary conditions in the present may be contingent upon the contemporary environment. That being the case, psychotherapeutic intervention might result in a radical shift equivalent to a 100,000-year jump in evolution, with psychotherapy as time machine.

We need diagnostics able to parse out when a person is experiencing mostly an evolutionary condition in a society uncomplementary to his or her neurology vs. a person suffering from an inability to ontologically progress because of threats in childhood. There are those that suffer both. I know several people with Asperger's struggling also with early childhood trauma.

The diagnostics might include a complete hormonal work-up. High testosterone females and low testosterone males comprise both matrifocal social structures. High testosterone males partnering with low testosterone females fit the patrifocal paradigms. There are profound brain differences between these two groups that are only now beginning to be understood. Physiologies differ.

To understand Freud is to realize that he believed that understanding our evolution is integral to understanding personality and personality disorder intervention. Shifting from a patrifocal focus to a perspective that embraces both social structure orientations provides a deeper understanding of our origins. From this vantage point, we might discover that many human mental maladies may be less about defect and more about how to discover where we live in time.

Such a perspective can allow us new ways to view the autistic.

37

Primary Process and Aboriginal Society

> Events and objects are self-contained points in another respect; there is a series of beings, but no becoming. There is no temporal connection between objects. The taytu always remains itself; it does not become over-ripe; over-ripeness is an ingredient of another, a different being. At some point, the taytu turns into a yowana, which contains over-ripeness, and the yowana, over-ripe as it is, does not put forth shoots, does not become a sprouting yowana. When sprouts appear, it ceases to be itself; in its place appears a silasata. Neither is there a temporal connection made–or, according to our own premises, perceived–between events; in fact, temporality is meaningless. There is no tense, no linguistic distinction between past or present. There is no arrangement of activities or events into means and ends, no causal or teleologic relationships. What we consider a causal relationship in a sequence of connected events, is to the Trobriander an ingredient of a patterned whole. He names this ingredient u'ula. (Lee, 1968, p. 334)

Stephen J. Gould (1977; 2002) would sometimes write of threefold and fourfold parallelisms. He was alluding to late nineteenth-century and early twentieth-century hypotheses that there are equivalencies among different scales of experience: biology, society, ontogeny and personal experience. Regarding Sue Savage-Rumbaugh's use of "Theory of Mind" when discussing her great ape subjects (Jablonka & Lamb, 2005), Simon Baron-Cohen's (1995) mind blindness, Hopi/Trobriand matrifocal society present-tense orientation (Whorf, 1956; Malinowski, 1961) and conventional Western dream consciousness (Erickson 1980), we possibly have an example of a pathway that evolution uses to travel across time and space.

Biology: Great ape behavior
Society: Hopi/Trobriand Islander language structure
Ontogeny: The autistic (early maturation prolonged to adult experience)
Personal Experience: Dream

The reason that the autistic are assigned to the ontological level of this fourfold parallelism is because those with autism often feature extreme maturational delay, by definition an ontological experience, resulting in the prolongation of infant or young features or characteristics into later developmental ages.

Jean Gebser (1985), Jurgen Habermas (1989), Ken Wilber (2000) and William Irwin Thompson (1981) all explored in detail a hierarchy of individual and societal developmental stages, equivalencies that they believed inform each other.

Having hierarchialized for several thousand years, informed by patrifocal social structures, we are now quickly horizontalizing, males neotenizing, with society prolonging the features of youth and the aboriginal into society writ large. Along with surges of creativity, narcissism, associative thinking and cooperation on massive scales with the advent of the web (Benkler, 2006) and global commerce, we are also seeing changes in neurology with the maturationally delayed emerging more and more often as the neurology of choice. In addition to our society reflecting features of our youth, dream consciousness in the everyday is being prolonged into the adult of our species. Primary process is appearing in waking life; aboriginal intuitions are manifesting in the way our teenagers think.

In other words, the past is becoming the present, dream is bleeding into waking, biology is emerging in society and the natal is manifesting in the adult. The autistic are dramatically increasing their numbers (Rice, 2009). Recent figures indicate that 1 of 60 males reveals autistic tendencies (Rice, 2009).

I hypothesize that aboriginal matrifocal societies will exhibit populations with larger percentages of males exhibiting conditions characterized by maturational delay, but without most of the features we'd describe as autistic. There might be increases in debilitating conditions

featuring high estrogen and high testosterone women, low estrogen and low testosterone men, if there have been radical changes in child-rearing practices accompanied by sudden diet and environmental rhythm modifications. Consider that the highly ritualized environment of aboriginal matrifocal societies, along with the ways children are raised and what they are fed, are preventing the further leftward shift of infants and toddlers. These conventions might be engaging young neurologies in such ways that there is far less autism, so that there are fewer people lost in an isolated, waking, primary process.

This thesis would suggest that aboriginal children taken from their mothers at birth or shortly thereafter, adopted by a conventional, modern, patrifocal family, might show high percentages of conditions exhibiting maturational delay and diseases associated with the hormonal extremes this thesis has been tracking.

Whereas matrifocal societies embracing modern culture will more likely exhibit the kinds of disease and condition anomalies this thesis proposes, aboriginal matrifocal societies will manifest these derivations far less often.

A profound connotation is that moderns raising their children using aboriginal techniques (constant rhythm, ritualized behaviors, specialized diet, unique touch or kinesthetic conventions, performance integrated into everyday life), particularly those women with high testosterone levels mating with males with low testosterone levels, could reduce the number of children unable to exit from primary process, the maturationally delayed, the autistic.

This is a thesis that suggests that aboriginal child-rearing practices may usefully inform a society with an increasing number of neotenous characteristics with matrifocal tendencies. Just as the features of our infant forebears manifest in the contemporary features of our species, what we would call classic neoteny, there are possible signs that characteristics of our societal forebears, aboriginal matrifocal societies, are characteristics that may usefully inform the features of contemporary times (Lehman, 2009).

I am proposing that there *is* a major difference between the humans living in our still-existing, ancient matrifocal aboriginal hunter-gatherer societies and what we would call modern humans living in the

industrialized world. I suspect these differences have a neurological, physical and behavioral foundation. I also suspect that an exploration of the relationship between primary process, which might also be called dream consciousness (one time, one place, no negatives), and autism might be useful as we seek to understand autism and conditions characterized by maturational delay.

If our matrifocal aboriginals experience waking life in some ways like we experience dream, if primary process is familiar to their waking experience or at least very accessible, then perhaps these aboriginals can offer us some wisdom and perspective regarding the surge of individuals familiar with primary process in waking life in the modern world, what we call autism.

It may not be politically correct to equate aboriginals with autistics, but consider that if there is a relationship, then the relationship suggests that a portion of modern society is drifting back to where we started mere tens of thousands of years ago.

Consider that modern times may be crossing a line whereby our future may have much in common with our past. This might suggest our evolution may be more characterized by a spiral than a linear pathway. We may be swooping around to a position with much in common with the last time we rounded this bend on the spiral highway.

There is the issue of whether contemporary autistic children are hardwired for the kind of group identity characteristic of the biological/neurological/hormonal constellation of ancient aboriginal societies and whether they need the specific child-rearing practices necessary for that biological/neurological/hormonal type. The work of Sarah Blaffer Hrdy (2000; 2005; 2009) is deeply informative of what specific child rearing practices may be relevant.

Our aboriginal colleagues may be in a position to teach us some important things about autism, beginning with: How do you raise an autistic child? If a society facile with a landscape characterized by primary process might be integral to a child's feeling at home within autism, then perhaps we should be observing tribal society closely.

These hypothetical aspects of primary process displayed by some aboriginal societies may be evidencing an alternative identity formation, one that requires specific child-rearing practices to encourage interpersonal participation by young minds. I am suggesting that particularly ancient matrifocal aboriginal hunter-gatherer societies are displaying earlier stages of biological/neurological/hormonal evolution. If those particular child-rearing practices are not engaged, then the repercussions might be withdrawal or a form of autism. A thing to consider is that some aboriginal societies may be exhibiting group identity, which is far from the cult of individuality that characterizes the contemporary United States, a form of identity that requires unique nurturing.

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Interventions

> The finding from these three tests of behavioral laterality suggest that as one side of the brain assumes control of the behavior in these tasks, a smaller CC [corpus callosum] favours increased control by the specialized hemisphere, whereas the larger CC distributes this role more equitably between the two sides. The magnitude of the resulting asymmetry, with better performance for the tasks lateralized to different hemispheres as expected, did not correlate significantly with the CC area. However, the amount of dual task interference was strongly inversely correlated with the CC area in both within-hemisphere (right hand) and between-hemispheres (left hand) conditions. Left hand slowing was significantly higher than in previously reported results, reflecting the increased demands and complexity of the task we used. As the CC area became smaller, the left hand (right hemisphere) performance was more interfered with by the verbal (left hemisphere) activity. This between-hemispheres relationship might reflect activation of systems distributed through the whole cerebrum rather than activation of a single hemisphere with increased task demands. (Yazgan, Wexler, Kinsbourne, Peterson & Leckman, 1995, pp. 775-6)

A number of interventions are being practiced as we speak, many having proved effective in specific cases. My recommendation is to travel to one of three places to gather techniques or routines to provide an ability for the autistic to have more choices in their lives. First, consider the lives of our evolutionary forebears in the context of the model proposed here. Second, examine the child-rearing practices of contemporary aboriginal matrifocal, matrilineal/matrilocal hunter-gatherer societies for conventions that would make the autistic more at home.

Third, explore what works now. Look for clues as to how that may integrate with this evolutionary theory and aboriginal society.

I've noted that a foundation of communication with the autistic might be constant rhythm, near constant touch, low-fat (no casein), nongrain (no gluten) diets (Hjiej, Doyen, Couprie, Kaye & Contejean, 2008), gestural language (Hewes, 1973; Corballis, 2002), singing and almost nonstop dance with an emphasis on performance. There are practitioners experimenting with these and related techniques. This work is not an exercise in expertise but creativity. Google the options and explore.

The work of Hrdy (2009) and her colleagues focus on the way that matrilineal/matrilocal hunter-gatherer societies raise their children emphasizing alloparenting; the fact that many children are often present from birth; the teaching of theory of mind that accompanies equalitarian community social structure; weaning often after 2.5 years; breast feeding when the child wants it; far more frequent exposure to fathers than agricultural, industrial or post industrial societies; and sleeping through the night with the mother until weaned.

Emerging are interventions seeking to affect those with autism by directly influencing their testosterone levels after diagnosis. Baron-Cohen has expressed near horror with these protocols. I share his repulsion. In addition, I believe that attempts to moderate a mother's hormone levels with direct testosterone or estrogen supplements to indirectly influence the children's hormone levels is a very bad idea. I have not come across in any work but this one the hypothesis that human split consciousness, self-awareness, is a direct result of the timing of maturation, with right hemispheric testosterone synapse pruning being directly influenced by estrogen levels. It is possible that both the levels of testosterone (Geschwind & Galaburda, 1987) and estrogen directly inform cerebral lateralization and corpus callosum structures (Moffat et al., 1997), enhancing or preventing split consciousness, or that peculiar experience humans describe as self-awareness.

In other words, embedded in this theory of human evolution and the causes of autism is the hypothesis that human self-awareness is subject to manipulation by adjusting testosterone and estrogen levels in a pregnant mother. If our evolutionary forebears reflect the neurology

of the autistic, and we understand how the sexual hormones influence the emergence of autistic features, then we may have the ability to understand exactly how humans emerged from primary process, or animal consciousness, to the modern split consciousness we all know.

Understanding autism, we understand ourselves. Adjusting hormone levels to reduce incidences of autism may result in changes we regret.

Ericksonian hypnosis is founded upon two premises useful for our purposes (Erickson & Zeig, 1980). 1) Engaging primary process communicative techniques is very effective at communicating with a person's unconscious. Those techniques may also be effective at communicating with the autistic. 2) An Ericksonian hypnotherapist uses biofeedback, or the direct and indirect reflection of the biological rhythms of the person he or she is relating to. To engage an autistic person with a mirroring of his or her experience may be necessary. Once the individual has been engaged, other interventions can be introduced.

It is not by chance that a hypnotherapy model may offer several ways to enter the autistic world. This work approaches autism on several scales. I believe that there are equivalencies between the human unconscious, animal consciousness, autistic consciousness and dream consciousness. Grasping these connections offers additional ways to understand the autistic and our own experiences.

The individual that is autistic may be making a choice insofar as he or she is split enough to grasp the idea of deliberate behavior. We are seeking to split a mind, guide a mind to become self-referential. There is the possibility that up to the point that an individual autistic person may be split, they may choose to split no further. Consider that many of us, as children, if we *had had* the choice to grow up or not, may have chosen *not* to grow up. For some of our autistic, this may be a choice they have and that they are making. The relatively small part of them that is self-referential may appraise and evaluate their environment as inhospitable.

Reproducing an environment that matches their neurological/behavioral experience is an important step if indeed some autistic individuals are *choosing* to withdraw.

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Four major barriers prevent the easy appraisal of the natural hormonal levels that characterize the eight human prototypes. Those seeking to prove the Geschwind-Galaburda (1987) hypothesis connecting lateralization, hormones, handedness, conditions and diseases were frustrated by studies with conflicting results. This Orchestral Theory of Evolution proceeds according to a paradigm very similar to the Geschwind-Galaburda (1987) hypothesis, and it is inhibited by an identical difficulty as it seeks to isolate variables in a context rife with multivariable effects. The following issues were mostly ignored during studies of the 1980s and 1990s that revolved around the work of Geschwind and Galaburda (1987). They are relevant to this work. I am defining autism as a social and evolutionary condition with a hormonal paradigm. When appraising autism hormone levels, one has to consider the following conditions.

Assays that fail to measure the variations of handedness with the degree of sensitivity established by Annett's (1976) peg tests obstruct new insight and obscure potentially valuable observation. Annett's (1976) work concluded that humans evolved as a random-handed species, which transitioned to right-handed when brains became lateralized for speech. Her peg tests measure degrees of right and random-handedness and are integral for establishing a locus related to social structure, disease/condition proclivity and maturation rate propensity. It is essential that different studies, particularly studies across cultures, compare apples to apples and use Annett's (1976) protocols when measuring handedness.

It would be useful if Annett's (1976) techniques were required to measure handedness around the world, quickly. Dietary changes within patrifocal societies may be skewing results dramatically. Aboriginal societies with a matrifocal foundation have almost completely disappeared. There are very few tools available to measure variations in societal-balanced polymorphisms. Annett's (1976) peg tests seem to measure the effects of testosterone and perhaps some indirect effects of estrogen fairly well.

The eight environmental variables noted above (diet, stress, light, drugs/alcohol, touch, exercise, body fat, tobacco) profoundly impact the hormone levels of males and females in a variety of contexts. To effectively measure the natural hormonal thresholds in ontogeny at any point, one must have an understanding of how that person's hormonal levels are being influenced and altered by external variables. Adult hormone levels are dramatically impacted by a variety of factors. Existing studies show wild variation in results because these studies ignore influential variables. One study that measured testosterone levels neglected to take into consideration the time of day that levels were tested. In addition, the effects of stress cannot be underestimated (James, 1986). For example, measuring the testosterone levels of an autistic child in an institutional setting does little to provide an idea of that child's base hormonal threshold, particularly if that child is on a standard institutional diet. Diet has been shown to have an effect on the symptoms of autism (Hjiej et al., 2008).

Some diseases and conditions appear at both ends of the left/right spectrum and occupy multiple poles of both matrifocal and patrifocal social structure. Annett (1985) approached dyslexia etiologies from a new perspective and established a protocol, which discovered that handedness congregated at both the extreme left and right ends of the spectrum. Diseases and conditions with more than one etiology often confound studies and frustrate attempts to discover patterns in social structure, handedness, hormonal constellations and ethnicity. It may seem that a disease such as schizophrenia, or a condition such as obsessive-compulsive disorder, does not always associate with a specific social structure or prototype predilection when more than one etiology or social structure is potentially in play.

Lastly, the season in which an individual is born affects the maturational delay and acceleration of that individual (Geschwind & Galaburda, 1987). Season of birth can thus help polarize a society's social structure to either end of the spectrum. The effects of pineal gland-influenced testosterone levels (Geschwind & Galaburda, 1987) may not merely be influencing those who live in migrating populations but also those who live in relative climatic extremes. When individuals within a society congregate at the hormonal extremes, vacating the balanced polymorphistic middle where those with the heterozygote advantage

reside, it becomes nearly impossible to form conclusions about a society normally based on a seamless arc, or balance. In other words, climate and migration patterns influence the variables we've been noting.

These four conditions that inhibit high-quality information regarding hormone levels—inconsistent handedness studies, untracked environmental variables, multiple-pole disease/condition etiologies and season of birth effects—are primary reasons that the Geschwind-Galaburda (1987) hypothesis drew mixed support. It is useful to take into consideration these impacts when evaluating the hormone levels of autistic individuals.

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Autism Predictions

> According to this theory [right-shift theory], the benefits of left hemisphere specialization for speech are induced by a gene (rs+) which impairs right hemisphere function at some sensitive period of cerebral growth. Those carrying one copy of the gene (rs+ -) heterozygotes, about 49% of the population) enjoy the advantages of lateralization of speech to the left hemisphere, with minimal risk to the right hemisphere, while those having two copies (rs+ +) homozygotes, about 32% of the population) risk significant loss of right hemisphere power. Those with no copy of the gene (rs - - homozygotes) are at no risk of hemisphere impairment (right or left), but risk developmental delays of speech and associated language skills due to the inherent difficulty of programming a large brain to serve speech . . . . (Annett & Manning, 1990b, pp. 61-2)

The predictions below focus specifically on issues of relative maturation rates with an emphasis on autism and related conditions.

1. Autistic males, from families of left-handers, will have lower testosterone than the norm, and autistic females will have higher testosterone. The mothers will have high testosterone (Baron-Cohen, Lutchmaya & Knickmeyer, 2004) and quite possibly high estrogen. If we evolved primarily from high F TE, M te, then autistic males will have low estrogen, and autistic females will have high estrogen. (In any study of autism, those with familial male maturation delay tendencies, or families of left-handers, need to be evaluated separately from those possibly traumatized by an environmental effect.)

2. Larger penis and testicle size will be associated with autistic, ambidextrous males and the familial left-handed. Left-handed males and autistics will produce more sperm. (This assertion is based on the large-testicle, matrifocal bonobo sexual egalitarian paradigm vs. the small-testicle, patrifocal gorilla harem paradigm; Smith, 1984; De Waal & Lanting, 1997.) If larger testicles and increased sperm production are associated with low testosterone, promiscuous social-structure males, then the two variables will be related in the sense that higher-testosterone males will have smaller testicles or lower sperm production.

3. Autistic males will exhibit more neotenous characteristics, while autistic females should show less neoteny than their contemporaries.

4. The children of parents of widely different ethnicities, separated by tens of thousands of years from common ancestry, will reveal characteristics of their last common progenitor and increased incidence of autism and left-handedness. (Maturational-delay progenitor-feature emergences will be far more common in matrifocal social structure families.)

5. Neoteny has dental correlations, with smaller teeth being characteristic of the neotenous smaller jaw (Montagu, 1989). Learning that teeth have grown smaller over millions of years (Montagu, 1989), researchers will find that they have actually grown larger in males over the last few tens of thousands of years as patrifocal social structure has taken hold. Ontologically, the teeth of males from older mothers should be smaller than the teeth of males of first-born, young mothers. The reverse should be true for females. In a large family, the male's teeth will erupt later and later, the female's earlier and earlier.

6. Because a mother's testosterone level rises with her age (Khaw, Tazuke & Barrett-Connor, 1988) and because she has children across the whole arc of her reproductive years, we might observe a display of personality and physiological features in her children that roughly reproduce human evolution over a span of eons. An older mother should more frequently have male children with maturational delay, female children with accelerated maturation and increased prevalence of autism in both sexes. Autistic children born to young mothers will

more likely come with less frequency from families of left-handers, trauma being a likely cause.

7. Obese mothers (overweight women exhibit increased testosterone and estrogen levels), particularly those who are older (Khaw, Tazuke & Barrett-Connor, 1988), should show high incidence of autism in their children, particularly in migrating populations moving from equatorial regions to northern climates.

8. If the low testosterone males and high testosterone females are late born, and high testosterone males and low testosterone females are the oldest children in a family or the first born, then first-borns will mate with first-borns and late-borns will mate with late-borns a higher percentage of the time than would occur by chance.

9. Hypothesizing that social structure has political correlates, it would be likely that in a politically conservative family, if liberals were to emerge, they would be among the youngest sons and daughters. One would also expect a higher incidence of divorce or serial monogamy with youngest children (reflecting matrifocal values).

10. Conditions that display maturational delay, such as autism, Asperger's and stuttering, will appear more often in males with longer limbs and smaller teeth than in others in their family of origin. This would suggest that the youngest males would also be the tallest. (Longer limbs and smaller teeth are neotenous features.)

11. Eating healthfully (the caveman diet) brings puberty later and provides a longer time for the brain to grow (Saugstad, 1989). Putting autistic children on such a late-puberty-enhancing diet may enhance their ability to connect. When puberty or progenesis in humans is dropped to a younger age by several years, it has neurological and cognitive repercussions. In addition to a possible increase in depression and bi-polar disorder, there is the potential for a general curtailment of the final stages of cognitive development.

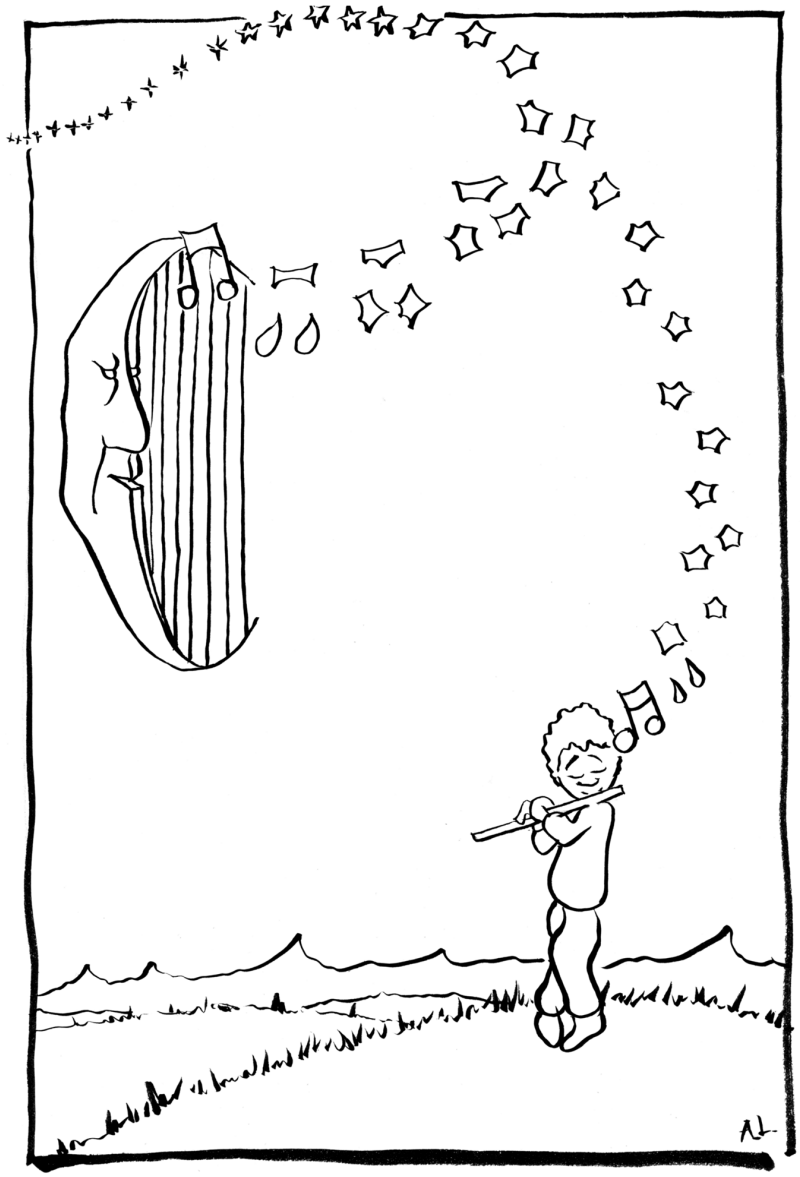
12. Societal periods of innovation will be preceded by periods of romance, revealing changes in the selection criteria by which females

pick their mates or by a widening of the selection criteria for the ideal male. Shifts toward increases in the variety of acceptable features in the procreation population will result in increases in cultural and technical variation. For example, if female infanticide is a tool used for patrifocal cultural stability, decreases in female infanticide over time within a culture will correlate with increases in societal and economic variation. These changes will result in matrifocal societal surges, increases in left-handedness and increases in autism.

13. If rhythm and dance were the aesthetics driving human evolution through rituals of sexual selection (Miller, 2000), then the sound and feeling of nonstop rhythm may be necessary to encourage the development of an autistic child. Rhythmic environmental triggers may be essential to the healthy growth of maturationally delayed children. By implication, comparing congenitally deaf left and right-handers may reveal an unusually high number of autistics in the left-handed group.

14. Equatorial peoples transplanted to northern climates will display higher percentages of maturationally delayed male children and maturationally accelerated females, including autistics, with the births congregating in certain seasons.

15. If a mother's allergies influence testosterone levels, for example, hay fever causing testosterone fluctuations (Geschwind & Galaburda, 1987), then allergies might be a factor in the cause of autism in her children. Birthdays of these autistics should cluster in certain months.



VII Conclusion

Additional Postulates and Predictions

> All these facts with respect to music and impassioned speech become intelligible to a certain extent, if we may assume that musical tones and rhythm were used by our half-human ancestors, during the season of courtship, when animals of all kinds are excited not only by love, but by the strong passions of jealousy, rivalry, and triumph. From the deeply-laid principle of inherited associations, musical notes in this case would be likely to call up vaguely and indefinitely the strong emotions of a long-past age. As we have every reason to suppose that articulate speech is one of the latest, as it certainly is the highest, of the arts acquired by man, and as the instinctive power of producing musical notes and rhythms is developed low down in the animal series, it would be altogether opposed to the principle of evolution, if we were to admit that man's musical capacity has been developed from the tones used in impassioned speech. We must suppose that the rhythms and cadences or oratory are derived from previously developed musical powers. We can thus understand how it is that music, dancing, song, and poetry are such very ancient arts. We must go even further than this, and, as remarked in a former chapter, believe that musical sounds afforded one of the bases for the development of language. (Darwin, 1871, p. 593)

Postulate 1: The process of evolution, the rules of species transformation, evolves. The rules change. Different rules apply to different species, the rules becoming more intricate and subtle with the increase in complexity in hormonal systems.

Postulate 2: In humans, there are (at least) eight environmental cues which influence somatic levels of testosterone (and estrogen), thereby influencing the rate and timing of development and maturation through uterine and zygote selection. The eight cues are light (Geschwind & Galaburda, 1987), diet (Schmidt et al., 1997), stress

(Cumming, Quigley & Yen, 1983; James, 1986), fat as a percentage of total body weight (Glass et al., 1977; Hamalainen et al., 1983; Ross et al., 1986), alcohol (Gordon et al., 1976; Castilla-Garcia et al., 1987) and drugs (Ahluwalia et al., 1992), tobacco (MacMahon et al., 1982), physical activity (MacConnie et al., 1986; Morville et al., 1979) and touch.

Postulate 3: The distribution of features selected for in females reflects an individual's location on the developmental spectrum. High testosterone (T) females (the older genotype) are at the accelerated end of the developmental spectrum compared to the low T females at the developmentally delayed end of the spectrum. Females at the right end are markedly more neotenous than left-end females. At the left end, relative to the females at the right end, the females are more left-handed and ambidextrous.

Postulate 4: The distribution of features selected for in males reflects an individual's location on the developmental spectrum. Low T males (the older genotype) are at the delayed end of the developmental spectrum compared to the high T males at the other end. At the left end, relative to the males at the right end, the males have bigger brains, more symmetrical cerebral hemispheres, larger corpus callosums, lower T, slower metabolic rates, an affinity for primary process, increased left handedness and ambidextrousness, and increased agility and coordination. Males at the left end are markedly more neotenous than males at the right end.

Postulate 5: In human beings and many other species, there is an inverse relationship between the amount of sperm produced and testosterone levels at the time of sperm creation. Less social, more aggressive, higher T males are inclined toward polygynous, or monogamous, social structures, and will have smaller testicles and produce less sperm than those with larger testicles, who are the more social, lower T, promiscuous social structure males.

Postulate 6: Selective processes resulting in an increase in neotenous features, whether that be selecting for increased sociability, cooperativeness, or 'tamed' behavior, results in increased sexuality in the form of more frequent estrus and increased sperm production. When embryonic features are prolonged into adulthood, there is an increase

in sexuality.

Postulate 7: A single condition or disease can have two or more manifestations at the extreme ends of the developmental arc or spectrum within the four social structures. Diseases and conditions will have different etiologies, and they will require different interventions depending on whether the individual is male, female, developmentally delayed or accelerated.

Postulate 8: Raised testosterone can have negative effects on the immune and autoimmune systems (Geschwind & Galaburda, 1987), the eight environmental variables (see postulate 2) often masking the natural T levels. By assessing where a person naturally belongs on the left-right scale, a person's natural T level can be calculated. Once a person's natural T level is known, the same eight variables can be used to change T, bringing that person in line with his or her natural immune and autoimmune threshold.

Postulate 9: Relative, complementary opposite, testosterone and estrogen levels in males and females inform the constellations of the two matrifocal and two patrifocal societal structures.

Postulate 10: Female infanticide is patrifocal culture's method for keeping only high T males in the procreation pool. In a polygynous society engaging in female infanticide there are far fewer females than males to mate. The males considered least desirable as husbands by the fathers of the females to be married go mateless. Female infanticide is an example of the patrifocal co-option of sexual selection from the female.

Postulate 11: Cultures (relatively) recently transplanted from an equatorial or tropical genesis may evidence highly fluctuating seasonal testosterone levels, compared to long-established cultures, resulting in extreme developmentally delayed or accelerated effects. Higher frequencies of specific conditions and diseases in Blacks and Jews, in addition to their peculiar lateralization and handedness distributions, may result from these ancestral migration patterns (in concert with little genetic mixing). See Minnesota Somalis for an example (Kenyanobserver, 2008).

Postulate 12: African males and females reflect matrifocal cultural ancestry. Asian males and females reflect a highly patrifocal cultural

ancestry. For example, African males have almost twice the testicle size, taking into consideration body mass, as Asian males (Diamond, 1986), reflecting a closer proximity to an ancestry of promiscuous social structures than the Asian patrifocal emphasis with widespread female infanticide. Asian females evidence far more neotenous features than African females (Montagu, 1989). Social structure origins, mother's age at conception, degree of latitude from equatorial origins and other factors influence the features of the progeny of immigrants.

Postulate 13: Puberty or progenesis in humans when dropped to a younger age by several years has neurological and cognitive repercussions. In addition to an increase in depression and bi-polar disorder, there is a general curtailment of the final stages of cognitive development.

Postulate 14: Specific ancient matrifocal, matrilineal/matrilocal aboriginal-hunter gatherer child-rearing and enculturation practices may be necessary to provide the autistic choices when integrating into current society. These include noncasein, nongluten diet (Hjiej et al., 2008), constant rhythm, performance, gesture (Hewes, 1973; Corballis, 2002), touch, song, dance, alloparent environment (Hrdy, 2009), sleeping nights with parent or alloparent (Hrdy, 2009), weaning past 2.5 years (Hrdy, 2009), breastfeeding on demand (Hrdy, 2009), fathers frequently present, many children present, and specific guidance on how to exercise theory of mind (Hrdy, 2009).

Postulate 15: Relative testosterone levels in males and females inform matrifocal vs. patrifocal societal structure. High T females choose low T males for their cooperative abilities, creating more egalitarian, matrifocal cultures. High T males choose low T females for their ability to be the complement to male authority, forming patrifocal cultures.

Postulate 16: A high percentage of artistic, narcissistic males, and females with borderline personality disorder, particularly those from families with left-handers, will have higher incidence of autism in their family.

Postulate 17: Narcissistic males will frequently mate with borderline personality females. The males will have lower testosterone, the females higher testosterone than the average.

Postulate 18: The children of parents of widely different ethnici-

ties, separated by tens of thousands of years of no interbreeding, should reveal characteristics of their last common progenitor and increased incidence of autism.

Postulate 19: Among contemporary cultures, patrifocal societies will exhibit increased sexual dimorphism compared to matrifocal cultures.

Postulate 20: The teeth of males from older mothers should be smaller than the teeth of males of first-born, young mothers. It should be reversed for females. In a large family, the male's teeth will erupt later and later, the females earlier and earlier.

Postulate 21: If neoteny is a powerful force influencing the transformation of society, then we might predict societal increases in transparency, diversity and horizontal communication as features of aboriginals and the very young are prolonged into the character of contemporary times.

Postulate 22: Teleological interpretations of cultural evolution are often the observations of the dynamics of neoteny or acceleration. Neoteny is engaged with the prolonging of features of the smallest bands into the largest societies with transparency, horizontal communication and equality entering society as it is invested with specific features and a predictable direction.

Postulate 23: *The Orchestral Theory of Evolution is the study of the rates and timing of maturation, with testosterone levels impacting rate and estrogen levels controlling timing, with those environmental or social structure adjustments that influence levels of testosterone and estrogen determining the speed, timing, features and direction of evolution.*

Conclusion

> The earliest civilizations of the world–in China, Tibet, Egypt, the Near East, and Europe–were, in all probability, matristic. Since agriculture was developed by women, the Neolithic period created optimum conditions for the survival of matrilineal, endogamous systems inherited from Paleolithic times. During the early agricultural period women reached the apex of their influence in farming, arts and crafts, and social functions. The metrical with collectivist principles continued. There is no evidence in all Old Europe of a patriarchal chieftainate of the Indo-European type. There are no male royal tombs and no residences in magarons on hill forts. The burial rites and settlement patterns reflect a matrilineal structure, whereas the distribution of wealth in graves speaks for an economic egalitarianism. (Gimbutas, 1991, p. 432)

In ancient cultures across the world, there are myths describing a time when women controlled society with a magic more powerful than men's. These stories go on to describe that there is a loss of the women's power. Yet the stories also express that there still remains an awesome strength tied to female menstruation; the monthly moon blood is to be feared and respected.

> As they harmonised their rhythms with those of the world around them, earliest cultural women must have felt the power in their own bodies to be intimately connected with all wider processes of cyclical renewal. It was almost as if their blood - source of all life - made the rains fall, the season change, the game animals reproduce and multiply. It would have been logical to feel this - if it really were women's sexual-political combined action which kept the social world so successfully turning in sympathy with wider ecological rhythms. When synchrony with the moon and tides was properly established, social

> life was successful, adaptation to nature's demands was appropriate, and therefore it seemed that the wind, the rain, the earth, the sky and all of nature was supportive of human life. In this context, we can perhaps imagine the sense of cosmic strength conveyed as women identified their own inner forces with the turning of the moon, with the success of men's hunting efforts, with their own gathering and child-bearing productivities, with the tides, seasons and other manifestations of cyclical change - and in tropical regions with the awesome force of lightning, thunder and the onset of monsoonal rains. (Knight, 1991, p. 512)

Not unlike the experience of traveling to little-visited, far-flung corners of the earth and finding surprisingly similar myths describing origins of local culture, we find ourselves filled with a similar wonder upon traveling to little-visited academic subdisciplines. Just as two far-apart aboriginal cultures might have no contact with each other, the heterochronic practitioners of evolutionary biology have little traffic with the neuropsychological theorists who may be located fewer than a hundred yards away in another building on the same campus. Strangely, we find these different scientists discussing identical processes in different terminologies with almost no published awareness that they have much in common.

How might two different scientific disciplines be discussing the same natural dynamic and not know it, like two aboriginal societies fearing menstrual blood half a world apart, unaware of another culture with the same belief?

The followers of heterochronic theory, tucked within the discipline of evolutionary biology, follow the influence of the relative rate and timing of development and maturation on species transformation. These theorists believe they have discovered a shortcut in the process by which Darwin's selective processes, natural selection and sexual selection, cajole and curtail the way species transform and go through metamorphosis. The concept is elegant. Instead of waiting for chance mutations or unusual random variations, the selective processes act to retain specific useful features characterized by changes in maturation. A simple variation in, for example, the speed with which an individual can reach maturity could mean that this faster-growing individual could

defend himself or herself against a threat to which another, slower-developing individual might yield. By passing on this ability to grow faster, this individual's progeny would also have an increased chance to survive.

This example is one of several ways of manipulating the development and maturation process. Growing smaller is an advantage in many situations, as is growing slower. For example, spending more time at a specific maturational stage, the stage when brain size increase is the most rapid, might result in a far larger brain when that individual reaches adulthood; for example, by having a more prolonged early infancy, some species might attain a larger brain size. All that changed may have been the rate of maturation at a specific age for a specific or extended period of time.

Stephen J. Gould (1977; 2002) suggests that the prolongation of the stages of infant growth into adulthood, since our divergence from chimpanzee-like ancestors five million years ago, would result in many features we identify as human. Human adults look like chimpanzee infants; in this case, a human's ancestral infant stage prolongs its features into its descendant's adulthood. An awareness of the rates and timing of maturation leads to an understanding of how humans evolved.

So how do rate and timing changes in hominid evolution relate to the studies of neuropsychologists?

Evolution is not just a record of the processes of the past leading to the present. Evolution is the process by which life unfolds in the here and now. The biggest block to understanding the connection between these two disciplines is the belief by many evolutionary theorists that the genes you pass on to your progeny cannot be revised once you have been conceived. The confusion has to do with the belief that our genes are randomly dealt according to a randomly created sperm impregnating an egg randomly created by the female's parents. Overlooked is that long, long ago, embryos and animals were naturally selected, to respond to changes in their environment, passing on these adaptations to their progeny in a form that their progeny could use to revise the rate and timing of their development and maturation to conform with what their parents' bodies had learned.

Changes in diet influence the onset of puberty (Saugstad, 1989;

Badcock, 1991). The onset of puberty has been dropping for 100 years, with teens now starting their changes three to four years earlier. It has been suggested that increased high-fat diets, nonmeat fats, carbohydrates, hormone-infused meats or even plain protein trigger earlier puberty, which generates a change in the body's environment that gets communicated to the next generation genetically when eggs and sperm are produced. Eggs and sperm are produced from the body's hormonal constellation at the time of egg and sperm creation; for the woman, her eggs are created when she herself is an embryo; for the man, sperm creation is within days of ejaculation. The parent's body knows hormonally that there has been an increase in specific elements of the diet. The message is passed on through genes that were naturally selected to be able to discriminate hormonal changes. It is an important message. It is a message that, over the course of several generations, can mean a huge difference in the number of descendants walking the globe. Early puberty means early procreation. A message that higher dietary reserves exist accelerates puberty, increasing the potential for more offspring to take advantage of the increased resources. Puberty has been dropping for 100 years as each generation has passed to the next the information that those resources still exist.

This is evolution in the here and now–individuals making it possible for their progeny to flourish in a changing environment. They are creating progeny prepared for the specific world they are entering. We pass on the information that directs our children into appropriate maturation rates based on how our hormonal systems fluctuate with the environment we live in. It is our hormonal systems that guide the creation of the egg, the sperm and the uterine environment that guide our children to a fertile adulthood.

Many neurological conditions and diseases are a direct result of hormonal messages guiding the rate and timing of development and maturation of individuals in circumstances that convention does not view as useful for survival. Extremely maturationally delayed individuals can evidence autism. Heterochronic theorists and neuropsychologists are both describing the effects of environments on the rate and timing of maturation. Both are describing the identical processes. Neuropsychologists see the effects of rate and timing changes on a time scale of the present–fast time. Evolutionary biologists have difficulty speeding up

enough to see it. Without the perspective across time–slow time–characteristic of an evolutionary biological point of view, neuropsychologists behave unaware that a condition may have an evolutionary foundation. Observing autism, they don't see its evolutionary origins. In both cases, because nonrandom changes can lead to single-generation changes, theorists trained to note only random changes do not see them.

Those ancient myths describing the power of women, the magic of menstruation, may be grounded in those same processes that make up the world of the evolutionary biologist and neuropsychologist. Aboriginal myths may be describing the power of the female womb to determine the specific nature of the child within. It has recently been discovered by Baron-Cohen that a mother's hormone levels while her child is in the womb dramatically influence that child's maturation rates. Artificial and environmental interventions change an embryo's maturation speed by changing the mother's testosterone levels. The blood of a woman carries a heavy magic.

Ancient peoples across the planet have myths grounded in a magic we are only starting to understand. Scientists in different disciplines may be actually exploring the same aboriginal territory, unaware that they have colleagues mere feet away in the very same jungle.

~

In a dream many years ago, I was in an ancient city. It is night and it is quiet.

I am standing by the great wall that protects the city. It is more like a mound. It does not rise straight up from the ground. Still, the wall is high enough to protect the citizens. Then, in the dream, I am viewing the city from the air, noting the great embankment making a circle around the buildings, castles, streets and homes. In the dream, I am noticing a feature of the stones that make up the protecting walls that reminds me of dragon scales. Looking closer at those walls, I am realizing that those are scales. Suddenly it becomes clear to me that the great circular wall surrounding the city is a mammoth serpent, asleep, protecting the city as she dreams.

That which we seek protection from, that which frightens us most, by its very nature is the very barrier that protects us. Our armor and the weapons that seek us are the same. What keeps us separate is also that which most terrifies us. Those edifices that provide us our identity are the very things that can take our identity away.

This is the paradox of being human. Becoming separate, we acquire split consciousness and self-awareness. What most terrifies us is the loss of that isolation.

I started this work a dozen years ago, seeking the origin of the dragon myth. I followed hundreds of dragon tales and their telling on six continents through a hundred books over a year and a half. Deep into the exploration, I found myself studying serpent myths, myths of the great goddess. These dragon tales were rooted in serpent stories from ancient societies that preceded the patrilineal invaders that retold them.

I asked myself if our most ancient societies, serpent-worshipping matrifocal societies, featured peoples very different from what we see now. I asked myself if there might be folks around today with any of those features. The autistic are often left-handed, often have bigger brains, are usually obsessive and poor with speech, and they often have perfect pitch. Having learned to talk at three, featuring a number of obsessions, with an ambidextrous dad and a bi-polar mom, I felt the characteristics of the autistic were familiar.

For me, this Orchestral Theory of Evolution is not just a model of human evolution but is a just so story that explains my personal origins. What began as an exploration of dragon tales became a quest to understand autism using an ancient story retold with new words. I sought to integrate nineteenth-century evolutionary theory with twentieth-century and twenty-first-century research from several disciplines. In the end, it has become a new evolution theory, The Orchestral Theory of Evolution, an explanation of the origin of split consciousness, or human self-awareness.

Evolution, autism and feminism are all connected. They make sense in the same way that we are aware.

~

When a current composer creates a symphony, he writes or types the notes to appear in a visual format to be provided to the various musicians by the conductor. The composer does not "code" a symphony; he creates a score that then provides an idea of what the composer had in mind. Musicians then marshal their assignment into existence by leveraging their skill with the instrument, paying attention to their own feelings, listening to their colleagues, watching the conductor and responding to the audience all at once. There are at least these five variables impacting each individual performance. Multiply that by the number of performers in a symphony and we begin to understand the subtlety, complexity and sophistication of DNA. It's as much about the environment as it is about the score (Gottlieb, 1992; Oyama, 1985; Oyama, 2000). That is the nature of art.

I hypothesize that music is not only a better metaphor than machinery or code for communicating how the genes and the environment relate, but music itself approaches the actual structure of the womb or egg environment engendered to produce an individual. Art is a peculiarly human undertaking. Its origins are explored far less often than language or culture, it being assumed that art is a contingent result of language or culture. Even though art as it manifests in female sexual selection proliferates across the planet in the form of (usually) males displaying features that females like, art is not often explored as that which compelled humans to evolve.

The reason I state that art (in this case, music) was not only instrumental in how humans evolved but is a direct reflection of how evolution operates is because neoteny, the prolongation of ancient ancestor embryo features into the adults of descendants, not only made contemporary adult humans more like our chimpanzee-like embryo progenitors (as in large head, big brain, small jaws, hairless skin, head back on shoulders; but made humans behave like an embryo behaves. Human adults make art and revel in environmental information to inform inspiration to create. This is exactly what I hypothesize embryos do. Embryos take their DNA score and proceed to proliferate growth based upon instructions from the environment. Just as an audience informs production, the environment guides growth or ontogeny. Art is not only integral to what it is to be human but is perhaps the most integral feature of what it is to be human. In addition, art may be also

how humans, and life, grow.

In other words, art may not only be the best way to represent those subtle and unique experiences that make life make sense, art may be the best way to understand how life actually unfolds. Science, seeking to make an experience reproducible by making the number of variables so few that the outcome can be controlled, may be doing the opposite of what life actually engages in if life is to be understood. Audience and performer, gene score and environment may be central to understanding not only evolution but ontogeny, individual experience and social relations. Maybe it's time science allies itself with art and makes itself part of an ensemble.

DNA's Central Dogma (Watson & Crick, 1953), a great name, created with sensitivity to religious lines that science, with awareness, seeks to cross, needs a new name. I would suggest Immanent Nature. DNA's Immanent Nature instead of Central Dogma suggests porous boundaries with a continuing awareness of the spiritual connotations.

If what makes humans human is that we directly reflect the processes engaged during earliest ontogeny, and our reflection of those processes compels us to create, then perhaps the unique self awareness also evidenced by humans is a feature of earliest ontogeny.

Immanence may be a feature of the system.

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Index

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That I might have featured Asperger's syndrome when I was young never crossed my mind until this year. I'd been studying autism for 12 years. Working for 12 years with the thesis that testosterone informs the rate of maturation, it never struck me that estrogen might manage the timing of maturation until last winter when I discovered I'd been casually considering it for a couple of weeks. My creative process is an artistic process that often features a conscious mind that is just along for the ride. There are similarities between those of us living lives deeply informed by the creative process and those that this society calls autistic.

Understanding autism is at the heart of my Orchestral Theory of Evolution. If this theory does explain how autism emerges and offers interventions that can improve the lives of those that feel inhibited by the condition, then there is the chance that several dozen conditions and diseases may be addressed by using the principles outlined in my work. My premise is that autism is a condition that features male maturational delay and, in females, maturational acceleration. Social structure, neurological anomalies and endocrinological differences are all integral to autism and Asperger's etiology. By adjusting our theory of evolution to take into consideration how exactly maturation rates and timing are influenced by social structure and the environment, the causes of autism and the causes of a number of other conditions and diseases are possibly made clear.

Autism does not have just one cause. Perhaps there are several different etiologies and autism will acquire several different names when the different causes are uncovered. The particular evolutionary dynamic I write about describes exactly how one kind of autism emerges, under what circumstances and in which kinds of families. I focus on four specific causes of autism that are directly connected to an underlying evolutionary matrix, a collection of processes that influence physical and mental health in a number of areas. Though I concentrate on autism, this work represents a new theory of medical etiology, removing natural selection from its present station as all that doctors know. In its place, I offer a number of tools that have the potential to make medical diagnosis an evolutionary intervention. Consider that if we understand that how we treat our bodies and what we are exposed to compel the evolutionary trajectory of progeny, with repercussions for both ourselves and our children, then understanding health becomes the same as how we choose to evolve.

- Andrew Lehman

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