The Origin of the Human Soul: Making Sense of Emotional Fossils

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True philosophy must start from the most immediate and comprehensive fact of consciousness:
I am life that wants to live, in the midst of life that wants to live.
–Albert Schweitzer

Abstract

That humans evolved to be hyper-cooperative has always been problematic for the Darwinian view of evolution: a struggle among individuals for scarce resources. The most fundamental fossil findings are consistent with the proposal that the appearance of humans six million years ago represents a rare major biological transition. For the first time, individual mammals (humans) began dividing and coordinating their functional activities while assembling into organism-like groups. The refinement of this collective capacity for teamwork is the decisive human adaptation and constitutes our core human instincts evolved over millions of years, referred to as the "old mind."

300,000 years ago, our own Homo sapiens species appeared. Because the evolutionary mechanisms of sexual selection and group selection became predominant, 1) cultural evolution, 2) the rise of economic behavior, 3) chronic war, and 4) mental illness resulted. The major mental illnesses are viewed as "emotional fossils" that provide insight into the evolutionary development of our emotions and motivations.

The symptoms of bipolar disorder reflect the breakdown of instincts evolved by sexual selection for the benefits of cohesion among clans. The symptoms of schizophrenia reflect the breakdown of instincts evolved by group selection for the benefits of groups prevailing in competition with each other. These often-disruptive instincts constitute our "new mind." Our new mind seeks equilibrium with our old mind, which persists as the humanizing legacy of collective functioning refined through the ages by our hominin ancestors and now experienced as our innermost soul.

Key words: soul, schizophrenia, bipolar disorder, major depression disorder, panic disorder, sexual selection, group selection

Introduction

My commitment to pursue the evolution of the human mind began forty-five years ago while working in a violent maximum-security prison as a psychiatrist. The inmates sought protection from each other within competing dominance hierarchies where some were personally enslaved by others. While talking to these men who were both imprisoned and enslaved, I became focused on the nature of their inner sanctuary as *individuals*—their soul. The soul seems to represent the essence of each of us as individuals. However, this mysterious bird in our body's cage could

never breath in a vacuum: the soul has *collective* social roots and is part of something bigger and more ancient than we are.

This essay proposes that, over millions of years, core sentiments that define us as human have evolved to be inherently collective and now are felt as the innermost experience of our soul. However, our own 300,000-year-old *Homo sapiens* species is distinguished by the emergence of a burning desire within each solitary heart leading us to descend into chronic war. Could the Abrahamic themes of a fall from grace and struggle for redemption reflect the evolutionary narrative of the human soul?

The modern histories of the world's great powers (China, Russia, the United States, and others) are interpreted as a broad underlying struggle between the individual and the collective in which the reassertion of our ancient human soul seeks gradually to attain equilibrium with our species' fractious instincts. For decades, with the passion of a fossil hunter, I have obediently followed diverse evidence of our common evolutionary narrative that expands to bodies, minds, and souls. For example, the enigmatic symptoms of severe mental illnesses are revealed as vivid emotional fossils that illuminate the emotions and motivations that have been, and continue to be, the inner experience of our epic human story.

Becoming human

Becoming Human: A Theory of Ontogeny, was published in 2019 by Michael Tomasello, a prominent investigator of the evolution of the mind. The book has crystalized the knowledge of a field in flux. Tomasello recognizes that the mystery of how the ape mind evolved into the human mind cannot be directly studied because "collaboration, communication, and thinking do not fossilize." He approaches the problem by studying comparatively the minds of apes and developing children to ascertain what is exclusively human in human nature. He proposes that *collective intentionality* (will) in communication is unique to humans, and that it has genetic roots and is not merely a by-product of culture. He has come to this conclusion based on the predictable timing across cultures of the unfolding of 1) shared intentionality arising at nine months old ("Let's both look at that pretty bird") and 2) collective intentionality starting around three years old ("That's the right way we ought to do it").

In attempting to fathom the human mind, there must be a firm grasp on the concept and evolutionary dimension of *intentionality*. Intentionality, which everyone intuitively understands, is derived from the verb, intend, which is related to will or motivate; but these latter two verbs are transitive needing an object: you must will or motivate yourself to do something, whereas you are the subject that intends to act. Intentionality has two dimensions: 1) the capacity to initiate and be the ongoing source or agent of an intention (will or motivation) and 2) it must be

directed at, or be about, someone or something. When I pick up a spoon, the source of intentionality is me, and it is directed at the spoon.

Tomasello assumes that collective intentionality was evolved for the benefits of collaborative foraging, and therefore the refinement of *teamwork* is the unique human adaptation. He then proposes that this human capacity to collectively coordinate group behavior was a major biological *transition* tantamount to the Cambrian Explosion of life some 500 million years ago when cells assembled into multicellular organisms. Just as individual cells assembled into organically coordinated groups of cells, ape individuals assembled into organically coordinated groups of humans.

The key is to draw the distinction between cooperation, in which each party co-opts something from the other in a win-win "game," and coordination, in which the synchronized engagement of divided labor leaves no room for individual–group trade-offs, and everyone rises and falls together. This watershed was crossed in both the Cambrian and human transitions when the benefits to the individual cell or ape of pursuing its own goals were overtaken by the benefits to each of coordinating their behavior as a group.

At a tipping point, disruptive competitive inclinations of individuals begin to be suppressed by natural selection for the coordination of each individual's labor into a harmonious team effort. Once past this tipping point, there is exponential growth in the productivity of teamwork, and natural selection for benefits to the individual, even as a stealthy predator, is quickly overwhelmed by natural selection for benefits to *relationships* among individuals. The target/benefactor of natural selection in the Cambrian transition shifted from individual cells to the signaling among cells, eventually evolving into neurological systems endowed with collective intentionality.

In like manner, natural selection also shifted from individual apes to behavioral codes among early humans, then evolving into human language, which is the analogue of neurological systems and was evolved for the *organic* coordination of human interactions. Human language is characterized by continuous-and-simultaneous signaling-and-receiving-signals, i.e., humans decide what to do as a group by constantly collaborating with each other in the process of making up their collective mind. The principal shift in paradigm here is to expand from thinking exclusively about individual cognitive capacities for our cooperative sociality to include the superordinate collective role of intentionality, which is integral to the phenomenon of mind.

What is the rudiment of mind? Imagine a lifeless collection of amino acids first acquiring the rudiment of life, which is to replicate. In the process of replication, mutations are naturally selected for traits that enhance the survival of succeeding generations of this new little bit of life. Because these newly acquired traits all promote the capacity of this burgeoning organism to

survive, it is transformed into a subject with the intention to survive, and in the process has achieved the rudiments of mind. ***Mind is the will to survive that emerges in the wake of natural selection*.**

Now turning to the Cambrian Explosion of life: in contemplating the wholesale shift in natural selection from individual cells to the connections among cells, it naturally followed that the will to survive also shifted from cells to the relationships among them in multi-cellular organisms, producing a higher order mind. And, in the wake of the transition of individual apes into collective intentionality, individual humans leaped into a still higher order mind animated by the will to survive that emanated from the relationships among them.

The following outline contains evidence for the hypothesis that the emergence of our hominin tribe six million years ago was a major biological transition in the history of life. In bold-type below are the known facts of early human (hominin) evolution. These facts are reinterpreted to be primarily influenced by the emergence in evolution of the novel social structure of individuals assembling into group-organisms with burgeoning linguistic capacity to coordinate their divided labor into teamwork. In other words, humans evolved in response to the ecology of their collective mind.

EARLY HUMANS (6→2.5 million years ago)

- With the stress of a **population collapse** in apes (Prado-Martinez et al., 2013), escalating selection for the benefits of teamwork shifted intentionality from the sterility of individual dominance to the productivity of collective authority triggering the following adaptations.
- **Upright posture,** the primary categorical human trait, and a costly adaptation due to lower back, knee and hip injury, enabled the face and upper body to become the publicly viewed instruments for the sustained-and-simultaneous signaling-and-receiving-signals necessary to coordinate minute-to-minute teamwork.
- In **skeletal fossils** of species found in different African environments, their feet, ribcage, spine, hands, and shoulders evolved at different rates, but they **all were moving in the same direction** (Berger, 2017). Why? Because they were all responding to the same *social* environment of collective motivations evolved for teamwork, which adapted to all physical environments.
- **Large molar teeth** (megadontia) were evolved for eating grasses in different African climates. True, grasses were generally abundant, but there was also no shortage of other grass-eating animals for potential predation (Ungar, 2017). Early hominins became herbivores because competition attendant to high-value meat would have disrupted their crucial adaptation for teamwork.

THE *HOMO* PEOPLES (2.5 million→300,000 years ago)

Justice

The species of our Genus *Homo* eventually became predominant hunters because they refined instincts for *justice* as an "immune system" against individual dominance, which is a pathology for organic teamwork. Modern hunter-gatherers are egalitarian (Pringle, 2014), and justice (punishing dominance) has been observed in far-flung hunter-gatherers, not influenced by wealth-creating agricultural practices (Boehm, 1999). There have been many proposals as to how justice and egalitarianism could have evolved within the game theory paradigm of competitive strategic transactions among self-interested individuals for scarce resources, but the following is the simplest and the most parsimonious way to unite the evidence.

Scots economist and moral philosopher Adam Smith is well known in his *Wealth of Nations* (1776) for attributing wealth to the division of labor, the self-interest of individuals being guided into productive engagement by an "invisible hand." Smith is less known for his *Theory of Moral Sentiments* (1759), in which he singles out justice as the one moral sentiment indispensable to productive social functioning. A straightforward evolutionary interpretation of Smith's profound thinking is that the invisible hand is the naturally selected collective capacity to coordinate labor, and that the coordination of divided labor is the principal human adaptation. Justice is the one virtue indispensable to productive social engagement because justice is the collective instinct that has been naturally selected to allow the benefits of productive social engagement to thrive. We have prevailed upon this planet not as individuals, but because we have been endowed by our noble ancestors with the capacity to engage in ever more elaborate teamwork, and it has been the natural selection for felt instincts for the rules of justice that has permitted this organic social system to take root and blossom.

Acheulean Hand ax

The toolmaking capacities of our ancestral species differ qualitatively from toolmaking in animals and would not have arisen in the absence of collective intentionality. The manufacture of stone tools emerged with our genus *Homo* and evolved into the near universal use of the Acheulean hand ax, which remained essentially unchanged across continents for 1.5 million years, a time of unprecedented brain growth. Although part of the establishment of this early tool industry involved widely dispersed genetically mediated manual dexterity, an opposable thumb, and hand-eye coordination, there can be no doubt that the *knapping* technique and teardrop shape of the hand ax were spread and maintained culturally—and there is the rub. We normally think of these kinds of cultural practices as spreading by imitation, causing their continuity over long distances and times to be fragile and subject to variation. Charles Darwin's challenge was to construct a theory that contained potential dynamic change over time within apparently

unchanging species; but the challenge of the hand ax is quite the opposite—why such enduring stasis in usually rapidly changing cultural transmission?

The *Homo* peoples evolved to be hyper-migratory**,** with constant mixing due to rapid climate fluctuations in the Pleistocene. This weakened territoriality, which would have disrupted their adaptation for teamwork. In *Fairweather Eden* (1998), Michael Pitts and Mark Roberts in Boxgrove, England, deduced from the relative position of half-million-year-old knapped stone chips that they had been knapped off hand axes simultaneously in groups. I propose that a central function of fabricating these tools, beyond butchering animals and other speculated uses, was as a bonding ritual that reflected and sustained their organic way of life. Hand ax construction was experienced as a restorative communion-recreation in which all immersed themselves into the authority of how it *should* be done. In my imagination, I can place myself into the experience of our ancestral species knapping essentially the same Acheulean hand ax for an astonishing 1.5 million years (from Wylie, 2020):

> Crouching in a circle, we are all glancing back and forth, not merely imitating one another's work, but watching for strokes made with the authority of how it should be and always had been done. We all instinctively know the familiar rectitude of wisdom flashing alternatively among us, making small adjustments with constant mutual recognition until general specifications are satisfied: the precise technique of striking, the proper size and shape.
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> Whether it be from one day, week, or century on into the next, the memory of what to do and when to do it was not stored in any individual brain. Rather, this knowledge was mixed into and among a given group—and all groups—in bits and pieces, which, when the moment arose, fell together in collective animation. Diffusing through time and space and linked by long repeating chains of unbroken mutual experience, this hallowed ritual, the emblem of a sacred tribe, scattered far and wide out into their diaspora from Africa out and across the expanse of Eurasia. Although individuals drifted from one group to another, small bands dissolved, and new ones reconstituted, these diurnal chains of communal functioning wove an unbroken fabric for 50 thousand generations across the expanse of entire continents.

Just as all the varied cells in our bodies have evolved a collective intentionality mediated by the neurological connections among them and protected by an immune system, so too did the collective intentionality of our ancestral species flow through the linguistic connections among them and protected by an immune system of refined instincts for justice.

Monogamy and big brains

Some monogamy facts: 85 to 95 percent of birds, 3 to 5 percent of mammals—but approximately 15 percent of mammals' primate component—are classed as monogamous (Díaz-Muñoz, 2013). Selected species of primates began evolving monogamous social systems about 16 million years ago, relatively late in their 52-million-year history of group living. In each case, monogamy grew

out of a promiscuous mating system (Opie, 2012), perhaps similar to that in chimpanzees or bonobos. Equal size between the sexes is the usual hallmark of monogamy because there is no need for males to compete for sexual access to females. However, if monogamy were part of a major transition to collective functioning, size differences would pertain exclusively to a division of labor between the sexes.

Although our own species is not strictly monogamous for reasons that will become clear, it is likely that a conversion from promiscuity to monogamy played a large role in the hominin evolutionary transition to collective function. Genetic *ancestral state reconstruction* studies indicate that monogamy also initiated the similar major biological transition of *eusocial insects* (ants, bees, etc.) to collective functioning (Hughes, 2008); the analogy between humans and eusocial insects will be further discussed.

Monogamy correlates with large brain size in animals because synchronizing the care of offspring (as in birds) takes more brain power than negotiating a hierarchy (Dunbar and Shultz, 2007). As non-productive competition among males for females abated, the communal sharing of childcare (*alloparenting*) described by Sarah Hrdy (2011) took hold. By the time the *Homo* peoples emerged, the advantages of coordinating divided labor in monogamous pair-bonds had spread to all social relationships, and, accordingly, synchronizing the survival behavior of groups evolved unprecedented brain growth. The principal thrust of the six million years of human evolution prior to our own *Homo sapiens* species had been the progressive refinement of coordinating groups' sequential perceptions-and-responses, mediated by the constant flux and flow of their collective function through language, the neurological system of the human group-organism.

HOMO SAPIENS (300,000→12,000 years ago)

Sexual selection

In his *Theory of Moral Sentiments* (1759), Adam Smith gets to the bottom of what economically motivates us:

> From whence, then, arises that emulation which runs through all the different ranks of men, and what are the advantages which we propose by that great purpose of human life which we call bettering our condition? To be observed, to be attended to, to be taken notice of with sympathy, complacency, and approbation, are all the advantages which we can propose to derive from it. It is the vanity, not the ease, or the pleasure, which interests us.

In his second great treatise about evolution, *The Descent of Man, and Selection in Relation to Sex* (1871), Charles Darwin theorized that *sexual display*—not just survival of the fittest—has been a major factor in human evolution. Darwin finally settled on the mechanism of sexual selection

when he concluded that the useless beauty of the peacock's tail is simply the result of the peahen's taste for beauty, and he pointed out that the desire for an attractive trait and the trait itself can *co-evolve* without regard to the trait's survival benefits. Examples of sexual display abound in nature, from birds' feathers and songs to insects chirping away, all saying to each other, "Here I am . . . Where are you?"

Yale ornithologist Richard Prum's *The Evolution of Beauty* (2017) reestablishes Darwin's disputed claim that the evolution of our own *Homo sapiens* species is centrally characterized by sexual selection. Darwin considered human behaviors such as singing and dancing as sexual display, and I would most certainly include the earliest cave art in Europe and Island Southeast Asia. Sexual selection for displays is reflected in our dating process whereby we sort through potential mates by our preferences for certain displays, many of which are aesthetic. The following is a fraction of manifold evidence for the vast influence of sexual selection in *Homo sapiens*:

- Examining the fossils of prior human (hominin) species, we find that the physical make-up of our present-day species (*Homo sapiens*), is more physically attractive and youthful looking to us. We are more slender (*gracile*) than our predecessor species, and we have childlike skulls.
- Certain physical features of our species, such as rounded breasts in non-lactating females, and attractive behaviors such as singing, can be explained by dating-type selection.
- Besides stone tools, archaeologists have found shells and beads 100,000 years old that have been pierced presumably so they could be worn as jewelry.
- Humans value gold because it is malleable and its luster does not tarnish, thereby making it the ideal body ornament.
- The major motivation behind social media is not to exchange useful information, but to display to others the attractiveness of one's life, food, pets, family, creativity, etc.

Why did this peculiar form of self-contained co-evolution between an attractive trait and the attraction to it become so prominent in our species? Sexual selection in *Homo sapiens* is driven not by individual dominance as in primate hierarchies, nor by the justice required for the engagement of teamwork as in our ancestral human species, but by the desire on the part of individuals to be desired by each other. As Adam Smith observed, in humans, the desire to be desired is not limited to mere mating as in birds and insects and is more accurately called *social display*—what psychoanalysts call narcissism and biblical texts call vanity. The reason that social display has become so predominant is because it has been our desire, *itself*, that has been naturally selected, and *not* our ubiquitous sexually/socially selected traits—which are widely

theorized, I feel incorrectly, to have been selected for the "good genes" that can afford the "handicap" of extravagantly superfluous beauty, like a peacock's tail (Zahavi, 1975).

The relentless pull of attraction effected by our desire for one other has been selected for the substantial benefits of amalgamating populations into progressively larger intercommunicating associations, for which there is genetic evidence. The genomes of Neanderthals reveal that they were "highly inbred, . . . lived in small groups, and had lower genetic diversity" (Prüfer, 2017) than those of contemporary 34,000-year-old *Homo sapiens* in which "a single social group . . . was part of a larger mating network, similar to contemporary hunter-gatherers" (Sikora, 2017).

The crucial benefit of larger intercommunicating populations is that more broadly pooled knowledge allows practical knowhow to be maintained across generations and thereby commence its own generative progression of natural selection in the cultural realm. Anthropologist Robert Boyd, a leading authority on the interaction of culture and evolution writes, "Perhaps our complex culture does not stem from individual cognition but from the shared knowledge we construct in groups" (Culotta, 2010). Although cultural evolution did not continuously take hold until about 40,000 years ago in the age of cave painting, the earliest *Homo sapiens* fossils are associated with elaborations of stone tools beyond the Acheulean hand ax (Richter et al., 2017). Indeed, the natural selection of knowhow—and of truth—stands as the most remarkable achievement of our species, and arguably of life itself.

Nevertheless, the accomplishments of civilizations notwithstanding, who among us would deny the veracity of these lines from Ecclesiastes 2:11? "*Then I looked on all the works that my hands had wrought, and on the labor that I had labored to do: and, behold, all was vanity and vexation of spirit.*" The same vanity that makes the peacock so vigorously shake its tail has not just drawn us together to seed culture, it has proceeded to become the motive engine driving our economies, which, in turn, became the predominant competitive meta-environment for the natural selection of, yes . . . vanity!

Indeed, the sudden transformation from millions of years of balanced, collective social incentives for productivity into competitive economies driven by individual vanity has caused hyper-selection for increasing the intensity of this peculiar social motivation—to the point that regulatory mechanisms in the brain could not keep up. As a result, in a significant portion of the population, the sentience that dynamically animates vanity began to escape its regulation, releasing it to "metastasize" into pathological mania.

In bipolar disorder, the hyperactive manic phase alternates with prolonged and agonizing depression, until another manic episode reignites, back and forth. Bipolar disorder can be viewed as a sign that the population has reached the physiological limit of intensity for our motivation to, not just economically survive, but to *win*. As a species, we have maximized the motivational

engine of our economies. Parenthetically, this mechanism of escape from regulation into pathologically unrestrained hyperactivity is also the mechanism in cancer, and cells that are pushed to grow-and-turnover quickly are particularly vulnerable.

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My day job as a psychiatrist was alleviating the suffering of patients living with mental illnesses, while at night, I contemplated the evolutionary meaning of their enigmatic symptoms. I gradually confirmed that the experiences of two kinds of major depression and panic disorder can be validly viewed as magnified caricatures of evolved social instincts that bind individuals into groups, and schizophrenia, along with the manic phase of bipolar disorder, reflect the intentional qualities of the two instincts that have emerged to characterize our own species. Before examining these manifestations of human nature, some historical context is helpful.

Half-Century of Shifting Psychiatric Paradigms

Like many major therapies in medicine, the benefits of lithium, Thorazine (chlorpromazine) and many others were discovered by astute serendipitous observations. Although my practice of psychiatry began in the 1970s in the waning years of the Freudian psychoanalytic paradigm, by the mid-1980s, the golden age of biological therapeutics had arrived, and mental illness became a "chemical imbalance" and "all in the genes." However, now it is thirty-five years later, and thorough knowledge of the neurochemical effects of therapeutic drugs has not led to the discovery of root biological mechanisms in mental illness, so most recently a substantial search for genetic causes has been undertaken. After analyzing over a million genomes, Harvard's multi-centered *BrainSTORM consortium* (2018) could not genetically discriminate risk factors for any of the major mental illnesses and concluded that their negative finding "underscores the need to refine psychiatric diagnostics."

But the reason for difficulties in discovering the genetics of psychiatric diagnostic symptoms is because the symptoms reflect the *normal emotional function* that is disrupted in the psychic sphere and not the brain pathology, which diffusely overlaps among all the major mental illnesses. Because the antecedent emotional functions that distinguish the symptoms are normal, their genetic determinants do not register as pathological; and, while these normal functions break down into their corresponding illnesses at the psychic level of experienced symptoms, the genetically detectable pathology lies in the failure of their regulation at the brain level, thereby releasing them into pathological hyperactivity.

Each of the emotions that motivate the handful of social intentions that comprise the aggregate of our mind break down into mental illness in the following manner: like sound, emotion varies in amplitude (volume), and ***a simple analogy of the felt symptoms of major mental illnesses is the***

input-output feedback-screech of a microphone and a speaker, and this pathological mechanism occurs at the psychic mind level of experienced emotions-and-motivations, while drug treatments attempt to regulate this pathological hyperactivity at the brain level by "turning down the volume." The categorical distinction separating *major* mental illnesses from *existential* problems is the pathological intensity of the experience—enough to dominate all mental functioning including *believing*.

The most common psychiatric conditions caused by this *pathological positive feedback* mechanism are two forms of major depression, which, along with pathological panic, are interpreted as *emotional fossils* for the two ancient motivations that provide the cohesive "glue" that maintains groups in all primates including humans.

The Old Mind

Social cohesion: DEPRESSION and PANIC

Our "old mind" motivates individuals by the powerful aversive-avoidance effect of two ancient social fears. The *fear of separation* was evolved to counter impulses to abandon bonded relationships. *Atypical depression* is commonly precipitated by the loss of a loved one: the subjective experience of separation fear (input) motivates repetitive escape into memories of past relational experiences (output), which then bids back progressively more separation fear, the back-and-forth process then escalating into pathological positive feedback.

Suicide in atypical depression is often accompanied by the delusion that it will lead to reunion with the lost loved one, whereas suicide in *melancholic depression* is motivated by escape from an intolerable *fear of entrapment*; commonly, intense preoccupation with escape in these patients is driven by delusions of being trapped in poverty or banished due to irreparable wrongdoing. The ancient fear of banishment functions to provide social cohesion by evoking feelings of physical claustrophobia (entrapment) at the periphery of society. A moving and articulate firsthand account of melancholia is the short memoir *Darkness Visible* (1990) by William Styron, celebrated author of *Sophie's Choice*:

> . . . it is not an immediately identifiable pain, like that of a broken limb. It may be more accurate to say that despair, owing to some evil trick played upon the sick brain by the inhabiting psyche, comes to resemble the diabolical discomfort of being imprisoned in a fiercely over-heated room. And because no breeze stirs this caldron, because there is no escape from this smothering confinement, it is entirely natural that the victim begins to think ceaselessly of oblivion.

Panic disorder is often precipitated by a circumstance in which one feels both *trapped and afraid to separate* as in a dead-end relationship or job. A frequent symptom of panic disorder is

the sensation of suffocation which is an intense feeling of being physically trapped; in response, the patient "escapes" this intolerable feeling by psychologically distancing him/herself from it. However, this produces an equally frightening feeling of self-separation, technically called *depersonalization*, in which the sufferer experiences an unsettling, disconnected feeling state that elicits a frantic fear of going "crazy." The pathological positive feedback of panic disorder consists of a rapid oscillation between psychological escape from suffocation (entrapment) into a state of depersonalization (separation), back and forth. Thus, the two cohering social motivations of our old mind are linked in panic disorder: one normally "pulls" bonded relationships together, and the other "pushes" groups inwards from their periphery.

The New Mind

Sexual selection: MANIA

The manic phase of bipolar disorder can be viewed as a vivid manifestation of the emotions-and-motivations that animate our "new" mind that emerged to characterize our own species. [*] The chain of logic here is first to link the cohesive effects of the desire intrinsic to sexual selection to the onset of cultural evolution, and then to realize this same desire—for attention and approval—became the motivational engine for the economic benefits of culture. We came together in increasingly larger more productive groups of groups fueled by the desire for esteem. As a direct result, selection for this desire was relentlessly pushed by the escalating benefits of this economic environment to a level of dynamic intensity at which brain-biochemical regulation fails**,** resulting in breakdown into the feedback screech of clinical mania. So, pathological mania is a "side-effect" of, and the "price we pay," for the ego-driven social and economic benefits of culture, just as the two major depressions and panic disorder are the price paid for the protection of living in groups.

In a manic episode, the sentient pleasure that normally motivates our new mind's addictive quest for social approbation pours out as if from a speaker in a feedback-screech, supercharging the careening roller-coaster-binge of euphoric manic behavior. The patient is both the actor and adoring audience locked into pathological feedback. (Although the manic phase is usually experienced as euphoric, the consequences of bipolar disorder can be disastrous, not only for the patient but for the family, and the depressive phase, which is a brain-shutdown over-response to the pathological hyperactivity of mania, lasts much longer and is exceedingly painful.)

[*] The major mental illness that clearly afflicts the function of collective intentionality evolved in pre-*Homo sapiens* human species is obsessive compulsive disorder (OCD) in which "what ought to be done" breaks down into pathological hyperactivity.

One consistent manic symptom confirms the recent time-period in which this odd rage for adulation emerged in our evolutionary history. There have been occasions when I have been temporarily drawn from my role as physician into stunned fascination by the linguistic performance of a patient in the throes of a manic illness. All manner of rhetorical flourishes and beautifully constructed phrases may pour out in a torrent. Often there is a magnetic quality to this verbal virtuosity, the meaning of which can constitute a brilliantly creative flight of ideas, all of which accurately corresponds in the natural world to sexual display like a peacock's tail. In the biography by Sylvia Nasar of the mathematician John Nash, *A Beautiful Mind* (1998), a visitor relates the following incident at the McLean Hospital in Boston, where Nash was hospitalized for schizophrenia:

> Robert Lowell, the poet, walked in, manic as hell. He sees this very pregnant woman. He looks at her and starts quoting the begat sequences in the Bible. Then he started spinning quotes with the word "anointed." He decided to lecture us on the meaning of "anointed" in all the ways it was used in the King James Version of the Bible. In the end I decided that every word in the English language was a personal friend of his.

As stated, mental illnesses are viewed as emotional fossils. Vital to dating a fossil is careful evaluation of the surrounding geologic strata in which the fossil is embedded. The cognitively demanding, intricately complex structure (syntax) of this linguistic performance fixes our pursuit of vanity as having evolved very recently, within our own species. Moreover, a simple understanding of the process of modern human language is that the mercurial and exhibitionistic new mind of the *me* weaves attractive clauses for verbal "display" upon a loom of dynamically responsive rules deployed by the sane and stable old mind of the *we*.

Group selection: SCHIZOPHRENIA

In our species' evolutionary narrative, a second-order consequence of the relentless selection for the competitive desire-to-be-desired has been the gradual onset of both individual and group violence, i.e., war. Anthropologists Nam Kim and Marc Kissel offer evidence in *Emergent Warfare in Our Evolutionary Past* (2018) that war has been in the process of slowly emerging during the entire 300,000-year span of our species**,** culminating with direct evidence for chronic war starting about 12,000 years ago. But there is very little evidence for intra-species violence in our ancestral hominin species.

So, pathological mania is the least of the debilitating side-effects of our intensely competitive desire for one other. Christopher Boehm (2012) points out that in human hunter-gatherer bands, "a noteworthy area that is poorly regulated socially, and which produces most serious conflict, is competition over females." Today, the spouse is the default suspect in any unsolved murder, and the two leading motives are greed and (another) romance. So, while thousands of generations of Romeos and Juliets ratcheted up pressure on diverse clans to amalgamate, clans were also

devolving into Montague-Capulet clannishness of hatred and violence. What probably started innocently enough**,** with adolescents courting one another**,** ended up fomenting chronic tribal war. So, the final evolutionary theater that rendered humans into who we are today has been thousands of years of battlefield selection for victorious warrior societies wielding long-evolved capacities for teamwork now reorganized into competitive dominance hierarchies.

Perhaps to put a "good face" on his most controversial theory, Charles Darwin introduced the concept of *group selection* by stressing selection of positive, prosocial instincts. But note the word, "victorious":

> There can be no doubt that a tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to give aid to each other and to sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection (Descent of Man, 1871).

War also engenders group selection that co-opts what collective intentionality (authority) is about—from justice and the productivity of relationships—to the fitness of competing groups.

Within the span of our species, instincts long evolved for the decisive benefits of immersion into collaborative functioning have been progressively commandeered for the benefits of tribes winning wars. The signature human inclination-and-capacity to immerse ourselves into the productivity of our associations has progressively been harnessed into immersing ourselves (*identifying* with, believing in) the hierarchical authority of our contending tribes. In the modern world, the political inclination to divide and take sides pertains to all social levels in a fractal manner, from cliques of three to massive political parties, and afflicts all groups including the scientific community. Very important is to realize that the predominance of this us-vs-them proclivity is a recently evolved acquisition, underlain by millions of years of natural selection for productive associations based on trust.

We have evolved a "social GPS" that unconsciously attunes us to the background messaging of authority that elicits loyalty to (belief in) the mores and prejudices of our nested groups; and it is this often-insidious process of identity that is disabled in schizophrenia, which is why people living with this disability are stigmatized as outcasts. When modern humans converse, there is an unconscious backdrop of strategic personal-and-group political maneuvering going on, which is disabled in schizophrenia.

So, both mania and schizophrenia are side-effects of the two intentional dimensions of our new mind, one motivating the vanity that drives our economies, and the other demanding the loyalty of belief in our competing groups. These two recently evolved instincts, one emanating from individuals and the other emanating from our groups, have been naturally selected for their

intensity up to the point of breaking down into the symptoms of mania and schizophrenia (which frequently co-occur in the same individual).

Just as mania is analogous to the feedback output of a screeching speaker, schizophrenia is analogous to the torrential input to the microphone. The emblematic symptoms of schizophrenia are delusions and hallucinations of thoughts and voices communicating to the patient from an external intentionality. Like mania the major depressions and panic disorder, schizophrenia is caused in large part by the failure of modulating mechanisms at the neurochemical level ("broken brakes"), but the actual pathological mechanism occurs in the psychic sphere; our often-irrational inclination to believe in our group identities is thrown into a sustained pathological feedback screech that results in the experienced symptoms of schizophrenia.

For example, in the Washington, D.C., Navy Yard shootings in 2013, everyone initially assumed that the perpetrator was a terrorist motivated by ("normal") hostile group beliefs. It turned out he was living with schizophrenia (which only very rarely causes violence). In an email recovered by the FBI, he expressed his motive: "Ultra-low frequency [microwave] attack is what I've been subject[ed] to for the last 3 months, and to be perfectly honest that is what has driven me to this." In schizophrenia, the internal emotional mechanism whereby the authority of groups normally communicate with their believers collapses into an intense feedback screech. Authority that the sufferer used to receive subliminally from his groups is suddenly felt to be rivetingly targeted at him personally.

HOMO SAPIENS (12,000 years ago→present)

Chronic war

Twelve thousand years ago, the *agricultural revolution* enabled individuals to accumulate wealth which they then needed to defend, ushering in unending chronic war. An unsettling prospect for our species' future lurks in the analogously successful species of eusocial insects, mainly ants and bees. They too have undergone a rare biological transition into collective functioning. As mentioned, a genetic study indicates that the early founding species of eusocial insects were monogamous (Hughes, 2008), similar to our first step in the transition toward the productivity of collective functioning. E. O. Wilson, who founded sociobiology, the field in which this essay is written, argues in his *Social Conquest of Earth* (2012), that ants shifted to group selection when they first started building nests they had to defend—ushering in never-ending chronic war which transformed them into their nightmarish social systems of sterile castes and queens. Are we headed down that same path?

I often wonder how Karl Marx would have responded to this historical narrative. Millions of years of natural selection for the justice and equality required for the refinement of collective

labor—and then, from within the solitary hearts of our own species, a lust for vanity emerges. As vanity begins to drive the economies of expanding populations, selection intensifies vanity into avarice, violence, chronic war, and mental illness. Then, in the wake of relentless selection wrought by unending tribal war, our ancient instincts for coordinating divided labor are usurped and subjugated by emerging tribal instincts for dominance. The collective power newly concentrated into competitive tribal authority (the power grounded solely in our ancient genius for teamwork) becomes the holy grail stoking the vainglorious appetites of tyrants.

However, we must remember, when considering where we are headed, that these disruptive instincts, although intense, are newly evolved and have not had time to gradually integrate with the instincts of our predominant old mind, deeply refined through the millennia for the productivity of justice and equality.

Awakening:

Our current epoch began with what psychiatrist-philosopher Karl Jaspers called the Axial Age, which flowered around 500 BCE, when "the spiritual foundations of humanity were laid simultaneously and independently in China, India, Persia, Judea, and Greece. . ." (*The Origin and Goal of History*, 1949). The Axial Age was an awakening followed by progressive reassertion of deeply evolved collective instincts for justice and morality that had been overwhelmed by thousands of years of intense grassroots selection for war-like hierarchical mentalities.

The gradual establishment of law (Hebrew, Roman, English common law, US Constitution) began to render war into "games" of politics and trade defined by hierarchical competition under the authority of rules. Economist Benjamin Ho in *Why Trust Matters* (2021) reminds us that mathematical game theoreticians have calculated how high levels of cooperation and trust have rapidly developed in modern economies, freely engaged, and motivated by Adam Smithian self-interest. But this would not have come about without the re-emergence of our long-evolved instincts for establishing the rules of the game.

The conservative faction in America believes that freedom should be the primary human pursuit; however, at least for our own species, there is no freedom, economic or otherwise, without justice—only dominance. Indeed, if the collective will for justice had never arisen, we would still be holding on in our jungle refuges with utter freedom to compete for domination over our extended families, and we would never have evolved the ability to make or do anything worth buying.

And, as to the truth, William Butler Yeats proclaimed, "We taste and feel and see the truth. We do not reason ourselves into it." Reemerging in the Enlightenment era has been the restoration of

our collective instincts for belief in the authority of truth, which had reigned supreme over six million years of collaboration within the countless tribes of our ancestral species, all in passionate deliberation as to which path would be the most righteous and correct way forward for all as a single creature.

Three Million Years Ago . . .

I become aware of a continuous chirping sound threading up from below while hiking on a promontory high above the East African savanna. After lying down with my binoculars to examine the vast plain beneath me, I am astonished by the sight of two groups of grass-eating apes, separated by roughly a quarter of a mile. I am charmed and fascinated to have discovered two herds, all harmlessly crouching and munching together. From the beginning, and steadily increasing, I have a profound sense that these creatures are unique. I eventually see two of these three-to-four-foot-tall animals (presumably mates) stand up straight and walk over to the other group to join them, but that is the least of it. It is subtle at first, but once recognized, undeniable: I become aware that the individuals in each group as well as constantly vocalizing are all simultaneously gesturing to each other. They emit a continuous emotional intensity that causes within me a growing sense of foreboding—of fear. As peaceable and closely comfortable as they are with each other, the thought occurs to me that if they discover my presence, all that harmony might instantly merge, and they could become extremely dangerous.

So, fearing for my life while fatally drawn to them, I watch them from my lofty perch. For two days, I am tortured by my inability to pin down what it is about them that both terrifies and enthralls me. Gradually I focus on how intensely in tune they are with one another, without a hint of dominance. Each group will be doing different things, but not at the lazy pace of chimps in a zoo or the way ordinary herd animals often react simultaneously to the environment. Then it hits me like a thunderstone.[ψ] The individuals in these groups are not just cooperating with one another; the entire behavior in these two groups is coordinated as if emanating from a single creature.

This is the collective human soul that still dwells within us all. This is the hearth in which the tribal pride that now inflames us continues to be forged by the enduring embers of our ancient mission to transform the power of aggression into the bounty of communion.

[ψ] Acheulean hand axes were called thunderstones in the Middle Ages. They were thought to have dropped from the sky, having been somehow produced by thunder and lightning.

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