

# **Evolutionary Jungian Psychology**

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## **1. Introduction**

In this article I will discuss an important convergence taking place between Jungian psychology, evolutionary psychology, and neuroscience. I will assume that I do not need to define Jungian psychology or neuroscience for this audience, and many readers will be acquainted with recent developments in *neurotheology*, which seeks to understand the neurological bases of spiritual experiences and practices. Perhaps least familiar will be *evolutionary psychology*, which seeks to understand human psychology in terms of its adaptive role in our species' evolution and by comparison with the evolution of other species' behavior. Much of what I will say is based on the work of the Jungian analyst Anthony Stevens; for additional information, see his books in the Bibliography.

Orthodox Jungians might worry about the effects of this encroachment of materialist ideas and methods. Will this not lead to a reduction of psychical experience to neurons and genes, which will suck the life out of Jungian psychology? I hope to convince you that this is not the case, and that each of these three disciplines may reinforce and expand the others, if we take the appropriate approach, recognizing psychical reality alongside material reality.

## 2. Archetype and Instinct

### Two Sides of One Phenomenon

The lynchpin connecting these three disciplines is simple: *the archetypes are psychological correspondents of human instincts*. That is, when you are behaving instinctually, you experience yourself to be in an archetypal situation. Activation of an instinct structures an animal's perception and behavior, and when *you* are that animal you experience a myth unfolding in which you are a key actor. Some people might find the idea of "human instincts" to be objectionable, for we have long flattered ourselves with the idea that we are completely autonomous and free, and that this separates us from "the beasts." However, evolutionary psychologists have shown that we are no different from other animal species in possessing a wide range of instincts, which have promoted the evolutionary success of our species. Jungians, too, are familiar with the ego's inflated opinion of its own autonomy and understand its more modest function in relation to the Self and the collective unconscious.

Indeed, Jung understood the connection between the archetypes and instincts. For example, he wrote, "To the extent that the archetypes intervene in the shaping of conscious contents by regulating, modifying, and motivating them, they act like the instincts" (*CW* 8, ¶404), and, "The hypothesis of the collective unconscious is ... no more daring than to assume that there are instincts" (*CW* 9, pt. 1, ¶91).

To reiterate, the instincts tune perception and behavior in order to fulfill some purpose important to our species, be it mating, infant care, cooperation, social

organization, defense, or competition for mates. When an appropriate *releasing stimulus* activates the instinct, you may feel you are living a myth or that you are possessed by a spirit with its own agenda. To take an obvious example, which almost everyone will recognize, when you are stricken by love, you may feel as though Aphrodite or Eros is governing your behavior; your perception of the beloved will be transformed, and they will appear numinous and divine; indeed, all of life may be experienced in a magical or uncanny light.

### **Evolution and the Instincts**

*Ethology* is the discipline that studies animal behavior in the context of its evolutionary development; that is, it seeks to understand how a species' instincts have evolved in interaction with its historical environment, and how they have promoted the survival of the species in that environment. The basis of ethology is the recognition that an instinct must be understood in terms of a species' *environment of evolutionary adaptedness*, that is, the environment in which it has evolved and to which that instinct has served to adapt the species. This is the context in which we may explain the *purpose* of an instinct (that is, its adaptive function). (For these reasons, many evolutionary psychologists refer to *evolved mechanisms* or *adaptations* rather than "instincts.") Therefore, to understand the purpose (adaptive function) of the archetypes (as the psychological correlates of the instincts) we must consider *Homo sapiens'* environment of evolutionary adaptedness.

Konrad Lorenz (1903–89) was the founder of ethology, and Stevens (2003, 28–9) observes that Lorenz and Jung can be considered complementary, for Lorenz focused on

external behavior, whereas Jung focused on internal experience. Of course there are other differences. Jung was more interested in people, Lorenz in non-human animals. Also, Lorenz and other ethologists are interested with placing behavior in its evolutionary context, whereas Jung was not so interested in this (a perspective offered by evolutionary psychology). Finally, contemporary *neuroethologists* are interested in the neurological substrates of behavior and how brains have evolved, whereas Jung abandoned neurology and most Jungians have avoided it (perhaps in reaction to the prevalent reductionist materialism of our time).

Therefore, in addition to their *interior aspect*, which is well-known from Jungian psychology, the archetypes have an *exterior aspect* when they manifest in behavior, and the exterior aspect is especially relevant as functional (purposeful, adaptive) behavior in the human environment of evolutionary adaptedness.

Thus, instincts, understood in their evolutionary context, provide us another perspective (an exterior perspective) from which to understand the archetypes. We can explore how these instincts have been adaptive in our environment of evolutionary adaptedness, and we can investigate similar instincts in related species (e.g., nonhuman primates) and how they relate to their environments. Since a species' instincts have evolved in their environment of evolutionary adaptedness, this is the environment in which the function of those archetypes is easiest to understand. Therefore, if we want to understand the function of the archetypes, and thereby gain a better understanding of their structure, then we should look to the environment of evolutionary adaptedness of *Homo sapiens*.

Modern humans (*Homo sapiens sapiens*) are believed to have evolved about 200,000 years ago in Africa. Further, as Stevens (1993, 67) observes, we have spent about 99.5% of that time as hunter-gatherers, until animal husbandry and agriculture began to appear about 10,000 years ago. In evolutionary terms this is not much time, so genetically we are very similar to our hunter-gatherer ancestors. That means that our environment of evolutionary adaptedness is the same as theirs, and therefore that our instincts and archetypes are essentially the same as those of paleolithic hunter-gatherers.

Based on studies of contemporary hunter-gatherer societies, Stevens (1993, 67) has outlined the characteristics of human society throughout most of our history, and so the sort of life to which we would expect our instincts and corresponding archetypes to be adapted. Comparisons with closely related primate species also adds to a behavioral understanding of the instincts, which complements the interior structure described in Jungian psychology and evident in myths and dreams. Stevens observes that hunter-gatherer groups typically contain 40 to 50 interrelated individuals, of whom six to ten are adult males, ten to twenty adult females, and the remainder juveniles. Sexual relations are not necessarily monogamous. Such groups spend much of their time in isolation, but encounter other similar groups from time to time, which may lead to fighting or exogamous mating.

One of the dilemmas facing modern humans is that our contemporary environment is very different from our environment of evolutionary adaptedness. Therefore the archetypes that served us well through nearly 200,000 years of hunting and gathering may not fit so well with contemporary culture and lifestyles. As will be

explained later, part of the goal of individuation is to achieve a reconciliation and accommodation between our contemporary lives and our genetic heritage, represented in the Self.

## **Neuropsychology of the Archetypes**

Just as the various physiological processes are functions of our organs as they develop in a normal environment, so human instincts and the corresponding archetypes are rooted in our bodies, but primarily in the brain as it develops in a normal environment. Although there is individual variation, the brain's gross anatomy as well as its detailed organization are the same for all people; so also the archetypes are common to all people, which is why we can speak of a *collective* unconscious and an *objective* psyche.

Nevertheless, it is unlikely that we will discover a simple relationship between the archetypes and brain structures (as is sometimes suggested by evolutionary psychologists' use of such terms as "mental organ" or "module"). If we think of an archetype, such as the Mother archetype, it will be apparent that it depends on many brain systems: perceptual, emotional, motivational, attentional, learning and memory related, and so forth. Thus, the neural structures subserving an archetype will extend through many regions of the brain, from the brain-stem to higher cortical areas. Furthermore, as Jung emphasized in his later writings, archetypes are dynamic structures, not static images; therefore we can expect different brain systems to be involved in different phases of an archetype's activation. Eventually, with more and improved imaging studies and with a deeper overall understanding of the brain, we may be able to chart all of the brain

regions subserving an archetype, but that time is well in the future. Nevertheless, in the meantime even a partial understanding of the neurological substrate of the archetypes will improve our understanding of them.

It may be worthwhile to emphasize that the archetypes, even as dynamical structures, are not fixed throughout an individual's life; that is, the dynamical structures *restructure* through time according to a developmental program. The first archetype to develop is, perhaps, a generalized Parent archetype, which soon becomes more specific as the nascent Mother archetype; later, the Father archetype is differentiated, and so forth. Adolescence accelerates development of some archetypes and causes a general reorganization of them all. This is consistent with what we know about the development of the brain, which develops rapidly into the mid-20s, but continues to transform itself thereafter (menopause being an obvious example). The old dogmas about the cessation of neuron growth are slowly collapsing, and every year brings new evidence of the brain's plasticity throughout life. Therefore, although the archetypes (as abstract structures) are eternal and unchanging, our relationships with them mature along with our bodies. A middle-aged man experiences Eros differently than does an adolescent boy.

Even the developmental change in the brain that has been longest acknowledged — neuron death — should be understood more broadly than “the inevitable decline of old age.” We now know that programmed neuron death (*neuronal apoptosis*) is an important mechanism in the brain's self-organization (which takes place in interaction with the environment). The unborn infant's brain grows many more neurons than it needs, and in a competitive process known as “neural Darwinism” it organizes, tunes, and optimizes

connections by eliminating approximately half of its neurons in a process that begins in the final trimester and continues for several years. There is another spurt of neural growth shortly before puberty, followed by another wave of competitive elimination continuing well into the 20s. This demonstrates that neuron death is not always a bad thing, that it may serve a useful organizational function (rather like weeding a garden or pruning a tree), and that even the gradual neuron loss of our adult years may serve some adaptive function. In any case, it is apparently an inevitable part of the human life cycle, and therefore the corresponding changes in our relationships with the archetypes are also a part of our life cycle, changes that lie along our paths to individuation.

Genetic variation among individuals, as well as differing environmental influences during development, will cause the archetypes to be a little different for each of us. Nevertheless, there is overall similarity among us, which is why we can speak of a collective unconscious comprising the archetypes. However, in addition to the developmental processes that I have mentioned, it's important to keep in mind that learning extends and modulates the dynamical processes governed by the archetypes, and in this way they may become much more individual, that is, they may engender personal complexes. I will return to this issue later.

## **The Human Genome and the Objective Psyche**

Now I would like to turn the discussion toward each individual's genotype, that is, the abstract sequence of approximately 300 million base pairs (A, C, G, T) that defines a person's genetic makeup. When encoded in the DNA of a fertilized egg, this sequence governs (in interaction with the environment) the development of the organism, including



its brain. Therefore, the seed from which grow the archetypes, as you experience them, resides in your genotype. Your genotype corresponds precisely to a number of approximately 180 million digits, and in principle a person genetically identical to you could be created using this number (it has been done already for viruses). Therefore this number is the seed of your archetypal universe and each of us has such a number, an idea with connections to ancient Pythagoreanism (MacLennan, 2005). (Your number can be stored in 75 MB, and so the numbers of you and eight of your friends can be stored on a CD-ROM!)

I hope that it is clear that I am not defending a simplistic genetic determinism. Your genotype is the seed of your archetypal universe, but only the seed; just as the same acorn in a different environment would produce a different tree, so also your archetypal universe is an ongoing complex unfolding of that genotypic seed in interaction with your environment (including, especially, other humans).

I should also forestall another simplistic interpretation of the genetic basis of the archetypes, and that is that there is a simple relationship between archetypes and genes. Just as each archetype involves many parts of the brain, so we should expect each archetype to depend on many genes, and that each gene may affect many archetypes. This is in fact the case for most genetically based traits. Therefore, it is unlikely we will find a gene, or a set of genes, that corresponds directly to the Mother archetype, for example.

In the foregoing I have stressed how each person's genotype is the seed of their archetypal universe, which may vary from person with their genotype and environment. As a consequence we may seem to have lost our grasp on the collective unconscious,

which is *collective* by virtue of being shared by all people, and on the objective psyche, which is *objective* by virtue of exhibiting the same structure to any trained observer. However, despite our individual differences, we all have recognizably human bodies, faces, stomachs, brains, etc.; that is, our similarities are much greater than our differences, and we explain the commonalities of our bodies and behaviors by reference to the *human genome*. But here we must be careful.

On the one hand, there is a temptation to think of the human genome as the genetic code of the *archetypal human* (the Neoplatonic or Gnostic *Anthropos*, of which Jung wrote), and there is some merit in that correspondence. On the other, it suggests the notion that there is an *ideal Homo sapiens*, of which we are all imperfect reflections, a notion which biologists have rejected for good reasons. Rather, biologists understand the human genome to be more like a statistical average of all the human genotypes in existence (that is, embodied in living people) at a given time. As a consequence, the human genome changes as the population of embodied genotypes changes, and this is how species evolve. Therefore, for the same reasons, the collective unconscious, as the sum-total of the human archetypes, should be considered a kind of average of all of our individual archetypal universes. Just as there is an objective *human* body, so there is an objective *human* psyche, the collective unconscious, comprising the human archetypes, but it exists only by virtue of our *individual* archetypal universes grounded in our *individual* genotypes.

As individuals are born and die, genotypes come into embodiment and pass out of it. Therefore, the genome, as a sort of average of all the embodied genotypes, changes

through time. To be sure, this is a slow process; the human genome has not changed much over the last 200 thousand years, which is what we mean when we say that modern humans evolved about 200 thousand years ago. Therefore, within this timeframe the archetypes have changed very little; in practical terms, they are eternal. Nevertheless, the genome does evolve, and E. O. Wilson has estimated there can be a significant change in human nature in about 100 generations. Therefore, as the archetypes evolve, we can expect important changes over this time scale (which is, incidentally, not very different from the nominal length of an astrological aeon: 2200 years).

Certainly the archetypes will differ among individuals, just as their faces and hearts do, a consequence of genetic variation and environmental difference, while still retaining the commonality that makes them a human face or human heart; so also, in spite of genetic variation, there is a human Self.

Perhaps the most significant difference in human experience of the archetypes is that between men and women. The difference between genotypes with XX chromosomes and those with XY chromosomes leads to *sexual dimorphism*, that is, the two principle psychosomatic patterns, male and female, for *Homo sapiens* and many other species. Sex-linked genes affect many characteristics of the developing body, including its brain, and so for humans, as for other animals, there are innate sexual differences in the instincts and therefore in the archetypes.

### **3. Reductionism's Slippery Slope?**

Jungians may be justifiably suspicious of attempts to reduce the archetypes and psychological experience to neuroscience, which runs the risk of diminishing the reality of both. They may fear that the lived reality of dreams, numinous experiences, synchronistic events, soulful encounters, active imagination, and so forth will be replaced by abstract mathematical formulas describing quantities of chemicals and electrical currents in microscopic neurons (if not other physical abstractions even further removed from human experience). There is certainly a danger of straying onto a slippery slope, leading from the archetypes, to the brain, to DNA, to abstract genes. Committed reductionists will applaud this trajectory, but I do not think it is either desirable or necessary. How can it be avoided?

First, as already remarked, we are very far from being able to explain the rich depths of the archetypes in neurological terms. Of course, this inability presents its own danger, because committed reductionists, faced with their failure to reduce the living richness of some phenomenon to materialist formulas, may simply deny the reality of those aspects that they cannot reduce (or consign them to the scientific no-man's land of "the subjective"). It has happened many times (a textbook example being Newton's reduction of color to wavelength, against which Goethe argued unsuccessfully).

The solution, I believe, is to hold fast to the phenomena. The ultimate ground of all our judgments of reality is our lived experience (for this is empiricism in its most fundamental sense), and so the reality of our psychological experiences cannot be undermined by theoretical judgments that are ultimately built upon them. Our archetypal experiences,

dreams, visions, and other psychical experiences must be taken as real phenomena (literally, “things which appear”). The meaning of them may be amplified, but should never be replaced, by understanding derived from neuroscience or evolutionary biology.

Indeed, the insights afforded by Jungian psychology need not just coexist with neuroscience and evolutionary psychology, but these insights may contribute to them in important ways. For example, evolutionary psychology, perhaps because of its connections to non-human ethology, tends to focus on behavior rather than experience. Thus, for example, when evolutionary psychology is applied to religious phenomena, it may produce valuable insights into the adaptive function of religious behavior, but it has had little to say about religious or spiritual experience.

Fortunately the recognition of the connection between the archetypes and the instincts provides the vehicle for bringing together the phenomenological and behavioral perspectives on human psychology. On the one hand, Jungian psychology provides phenomenological and analytical tools for exploring the instincts from their psychical side. On the other, neuroscience allows us to understand the material processes underlying the archetypes, and evolutionary psychology reveals their adaptive significance. Each side may suggest hypotheses and explanations to the other.

From the perspective of Jungian psychology, we should not fear this encounter with neuroscience and evolutionary psychology; rather we should embrace it. We have two opposed perspectives on human nature. Jungians recognize the danger of the reductionist materialist juggernaut, which threatens to destroy all forms of understanding but its own. On the other hand, in other times and places, we know that the material

embodiment of the soul has been neglected, to the detriment of our understanding of both the body and the soul. Attempting to replace either side by the other is a mistake. In these cases, as Jung has shown, we need to embrace the opposites and accept them both, uniting them in our symbolical structures. In this way we may transcend the differences and build a higher unity.

#### **4. Specific Archetypes and Complexes**

In this section I will discuss some specific archetypes and complexes in order to show how neuroscience and evolutionary psychology can extend our understanding of them.

##### **Archetypes**

###### *The Self*

First we may consider the *Self*, which comprises all the archetypes; that is, it is the totality of the archetypal universe. From the external side, you can see that the *Self* corresponds to the full range of human instincts, which has its foundation in the human genome. That is, the genome encodes the “seed” from which the *Self* develops.

The genome of any species defines its characteristic life cycle, which is fitted to its environment of evolutionary adaptedness. Therefore also, the human genome defines the archetypal life cycle of all of us, which we may realize in our individual lives, more or less. Further, the genome, as manifest in the diversity of embodied genotypes, is the foundation for the future evolution of our species. This “phylogenetic destiny,” encoded

in the genome, manifests psychically as the Self, which has its own agenda for our lives, as most of us eventually discover. The archetypes activate and intervene in our lives in often surprising ways.

Thus we may view from an evolutionary and genetic perspective the process of *individuation*, the process of becoming psychically undivided, or, as I would put it, of acquiring primary integrity. Since the genome defines, in the most fundamental biological sense, what it is to be human, so also the Self defines *human* experience, insofar as it is universal and (practically) eternal, rather than individual. Nevertheless, within this shared human destiny, our individual destinies differ somewhat, as do our genotypes, and so our individual Selves differ somewhat as images of the universal Self. We become individuated by consciously articulating and reconciling our individual lives and destinies with the destiny of our species, and in this way we bring transpersonal meaning into our lives by living them in the context of universal humanity. We thereby become conscious participants in the future evolution of humankind.

As is well known, the archetypes correspond to the gods of the various polytheistic pantheons, and, although I will be unable to discuss evolutionary neurotheology in any detail in this article, it will be worthwhile to consider this perspective. By transferring results from our evolutionary perspective on the archetypes to the gods, we may conclude that, although they are practically universal and eternal, in fact they present a slightly different face to each of us (growing out of genotypic variation), and they change (evolve) slowly through the ages, on the time scale of thousands of years. Indeed, the evolutionary perspective helps us to understand the nature

of the gods, for the human genome, and therefore the gods, have not changed much over the past 200 thousand years. Further, since we have spent 99.5% of that time as hunter-gatherers, it is reasonable to conclude that the gods whose nature is encoded in our genome are the gods that have promoted the survival and flourishing of paleolithic hunter-gatherers living in the social groups already described. This reveals the great challenge facing modern humankind (and the cause of many of civilization's discontents), for we are post-modern information-industrialists living in a global megalopolis comprising billions of individuals, yet still living under "divine laws" suited to paleolithic hunter-gatherers! Arguably, this is why individuation is an imperative for us, even if it wasn't for our paleolithic ancestors.

### *The Shadow*

The *Shadow*, of course, is very important, but we must distinguish the Archetypal Shadow from the Shadow Complex that grows up around it. (In this it is like most archetypes, which engender one or more complexes that develop around them as an archetypal core.) The Archetypal Shadow corresponds to instinctive aversions to certain behaviors. These would be behaviors that have been relatively maladaptive in our environment of evolutionary adaptedness. The most often cited example of such a behavior is incest, which has an obvious deleterious effect on the inclusive fitness of a group under most circumstances. Therefore it is reasonable to suppose that incest is a component of the Archetypal Shadow (although some anthropologists disagree). Apparent cultural universals can often provide clues to the nature of the Archetypal Shadow. I will discuss the Shadow Complex later.



*The Archetypal Numbers*

Any reader of Jung's later works cannot help but be struck by the importance of archetypal numbers: unity, duality, trinity, quaternity, and others, including multiples of these (eights, twelves, sixteens). (Notice that they are more like *qualities* than *quantities*.) Indeed, on several occasions Jung expressed the thought that the most fundamental archetypes might be numerical, an idea explored by Marie-Louise von Franz (e.g., in *Number and Time*). For example, he said, "I have a distinct feeling that number is a key to the mystery, since it is just as much discovered as it is invented."

I believe that evolutionary psychology and neuroscience can help illuminate the importance of the archetypal numbers. Interestingly, this has the effect of bringing these disciplines and Jungian psychology into close alignment with Pythagorean and Neoplatonic thought (with which Jung was familiar and which are in the background of the Gnostic and alchemical ideas that also influenced him). Tracing these connections is beyond the scope of this article, but I have discussed them elsewhere (MacLennan 2002, 2005).

Von Franz said, "The lowest collective level of our psyche is simply pure nature," but we cannot simply equate the collective unconscious with the physical universe; this would be to dilute the term "archetype" to meaninglessness. We can solve the problem, I believe, by reconsidering the relation of the archetypes to the genome. The human genome defines the characteristics of human beings, but many of these characteristics have nothing to do with the archetypes. For example, the genes that define the basic structure of our tissues and organs, the biochemistry of our cells, etc., have nothing to do

with archetypes (so far as we know). For a gene to affect an archetype (which is the psychological aspect of an instinct) that gene must influence a process that has a psychological aspect, that is, which can, at least potentially, affect our consciousness. Many physiological processes have no such aspect, so far as we can tell. On the other hand, any process that is common to all humans and has a psychological aspect will be archetypal; it will be a part of the objective psyche. Such archetypal processes remain in the collective unconscious until they manifest in conscious experience.

Certainly the numbers, or at least certain numbers, are archetypal. We find Unity, Duality, Trinity, Quaternity, and some others described in similar terms in Pythagorean philosophy, alchemy, Taoism, the Qabalah, Hinduism, and many other systems of thought. The archetypal numbers seem further removed from our life than the familiar archetypes (Mother, Father, Anima, etc.), for the familiar archetypes correspond to instincts that govern human relations, and so they are often personified and behave as autonomous personalities (i.e., as gods). The numerical archetypes, in contrast, are experienced as impersonal forces. The greater remoteness and unfamiliarity of the archetypal numbers is why throughout history, even in polytheistic cultures that honored the archetypes as gods, the lore of the archetypal numbers has been confined to esoteric groups (Pythagoreans, Qabalists, alchemists, etc.).

Granting then the existence of numerical archetypes, we must ask what are the processes, common to all humans, that lead to these archetypal experiences. So far as I know, this question has not been investigated adequately to date, so I will offer a few ideas. I think that the archetypal numbers correspond to certain common physical

processes in nature, which occur in the brain as well as elsewhere. When they occur in our brains, we experience them as archetypal situations; when we perceive them in the external world, we may project our archetypal understanding onto them.

Consider Duality, the quality of the archetypal number Two, which underlies psychological experiences of opposition, dichotomy, and clear differentiation (which will be experienced in some form by all animals, not just humans). One manifestation of this experience is the satisfied feeling of sure classification (we know what we are looking at, we know what to do about it, etc.). The comfort of this state explains why so many people avoid the uncertainties of complex situations and cling to fundamentalist ideologies of one kind or another (including scientific fundamentalism!). We also experience Duality in a less pleasant form when we are on the horns of a dilemma, forced to choose between alternatives that are equally attractive or unattractive. Ethologists call this a *state of conflict*, and being on the cusp between fight and flight is a familiar example, an archetypal experience common to all animals.

Archetypal Three can manifest in several ways. One is the state of mediation or balance between opposed poles, which is a relatively static experience. Another is more dynamic, and that is the feeling of a connection, proceeding from a beginning to an end, as when a state of conflict resolves into a course of action. Clear classification, the state of conflict, and the resolution of a conflict are all archetypal experiences that can be correlated with physical processes in the nervous system.

Finally, the experience of Unity, which transcends the Duality of self and other, is of course fundamental to mystical experience. I anticipate that deeper investigations into

the psychical aspects of fundamental physical processes will illuminate these archetypes, and conversely reveal the archetypal and psychical aspect of physical law.

## **Complexes**

### *Formation of Complexes*

I have mentioned complexes several times already, but now I would like to take them up more systematically. The human genome provides the seed for the archetypes, which to a first approximation are the same for all people. More accurately, the genome changes slowly over time (hundreds of generations), and so also do the archetypes. Further, there is genetic variation among people, and the archetypes become further “personalized” by the development of the corresponding neural structures in an individual’s environment. Nevertheless, in broad terms we all share the same archetypes, and so we can speak of a collective unconscious. Furthermore, our individual lives have only an indirect effect on the archetypes. Certainly, our individual actions, especially those that directly or indirectly influence reproduction, will influence the evolution of our species, and therefore of the genome and the archetypes (and so the gods respond to our actions), but these changes are incremental, slow, and more a reflection of the entire population than of any individual.

The brain, however, is capable of several kinds of adaptation. Aside from the slow adaptation effected by natural selection over many lifetimes, there is learning, which is much more rapid and adapts an individual’s brain to the particularities of that individual’s environment. Loosely speaking we may identify the archetypes with genome-governed

development of neuroanatomy and gross patterns of connection, and learning with the tuning of these connections, but the actual situation is more complicated, for there is a continuum of adaptive processes from neuron overgrowth and pruning, to growth and atrophy of connections, to fine adjustments in synaptic connection strength. Leaving aside the details of the mechanism, we may say that as an archetype is activated repeatedly, or especially in emotionally charged situations, over the course of an individual's life, a web of associations, created according to the laws of similarity and contiguity, grows up around the archetype. The resulting *complex* particularizes or individualizes the archetype for each person, for better or worse (complexes may be more or less supportive of our personal goals!). A complex can channel the manifestation of an archetype in an individual's life, thus adapting it to time and place. Because of this individual content and structure, complexes reside in the personal unconscious, rather than the collective unconscious. Therefore, complexes can be considered interfaces or mediators between the archetypes and our individual psyches.

### *Daemons*

As is well known from Jungian psychology, the complexes behave like autonomous personalities. We can be "possessed" by our own complexes, project them onto others, or accept others' projections and become possessed by them. In this respect the complexes are similar to the archetypes, but the complexes are much more intimately related to our individual lives, for they incorporate material (i.e., associations) from our biographies. So also their interventions in our lives are more specific than those of the archetypes and are directed to us as unique individuals.

From a theological perspective, as the archetypes are the gods, so complexes are *daemons*. Historically, the ancient Greek word *daimôn* (Lat. *daemon*) could refer to any divine entity, from the high gods (Zeus, et al.) to nature spirits (nymphs, etc.), but in the philosophies of late antiquity, especially Neoplatonism, the term was applied specifically to the mediating spirits that oversee the relations between mortals and the gods (whom the philosophers described as *impassive*, that is, relatively insensitive to particular events). Although the gods might not pay much attention to individual humans, being more concerned with the overall governance of the universe, daemons took more of an interest in individuals. Indeed, most philosophers believed that individuals were assigned personal daemons that accompanied them throughout their lives. (Socrates' guardian *daimonion* is a well-known example.) In the monotheistic religions, these spirits mediating between God and humans were identified with the angels (from Greek *angelos* = messenger, a word used by the pagans to refer to certain orders of daemons). (The gods of polytheistic religions were often identified with archangels.) The writings of pseudo-Dionysius the Areopagite provide a nice example of this perspective.

In summary, as an archetype are activated in an individual's life, a network of associations grows around it, which particularizes the archetype to that individual; the resulting complex resides in the individual's personal unconscious and continues to evolve throughout the individual's life. In an exactly parallel way, we can say that a god engenders personal daemons, who accompany a person throughout his or her life, and that the nature of that daemon incorporates particulars from the individual's life, especially as they relate to that god. Since these daemons/complexes intervene in our lives in many ways, especially mediating our interactions with the gods/archetypes, an

important task in the individuation process is to become familiar with our daemons, to recognize their arrival, and to negotiate an accommodation between their needs and ours.

### *The Superego*

Human beings are social animals, and one of the most fundamental things we must learn are the rules that govern our interactions with other people. Human language is one of the most prominent examples of structured interaction among people, but there are many other, a significant number of which we share with other primates. The effectiveness, in an evolutionary sense, of social groups is improved if its members can learn these rules quickly, and so it is not surprising that humans have an innate predisposition to learning rules of social interaction. Leaving aside language, I would like to focus here on the rules defining acceptable social interaction. Although, like language, the specific rules differ from culture to culture (and in effect define a culture), the predisposition to learn rules of this kind is innate and has an archetypal aspect. (Thus, mythology typically addresses the origins of society, laws, and social customs.) Like language, most of these customs are learned implicitly, by observing others and by positive and negative reinforcement of acceptable and unacceptable behavior. The result is the emotionally toned complex of behavioral dispositions and aversions that we call the *Superego*.

We begin to learn behavioral norms at our mothers' breasts, and later internalize our family's norms. As we become acquainted with other people we discover that other families have different norms, and we begin to differentiate (often subconsciously) our family's norms from those of the community at large. As our experience widens, we

discover that there are regional, national, and even international norms. We also discover that there are norms peculiar to the various groups to which we belong or with which we interact. Therefore, we can see that the Superego has a complex hierarchical structure, which mirrors to some degree the structure of society. Alternately, we may say that there is a hierarchy of superego daemons; for example, there is a family superego (shared by all members of the family), a community superego, a national superego, and so forth. These superegos are hierarchical in terms of the containment relationships of the groups with which they are associated, but not in terms of the norms they enforce. For example, some behaviors may be acceptable in the community that are not acceptable in the family, and vice versa.

It is critical to recognize that the superego daemons serve the archetypal forces of group cohesion and may be at odds with other archetypes. An obvious example: the superego of societal norms is often at odds with sexual archetypes whispering (or shouting), “Mate! Mate!” Thus also ancient philosophers distinguished *nomos* (conventional law) and *phusis* (natural law). Herein lies the root of one of the fundamental challenges of modernity: to negotiate an accommodation between the superego daemons of conventional morality (some of which, at least, is based on sound ethical principles) with the gods of paleolithic hunter-gatherers, who are with us yet.

### *The Baldwin Effect*

Although the superego complex is constructed of behavioral norms acquired during an individual’s lifetime, and thus is a matter of “nurture” rather than “nature,” there is a mechanism known to evolutionary biology by which these learned norms can



affect the genes. This is called the *Baldwin Effect* and has a simple explanation. If through chance or any other circumstance some individuals have a genetic predisposition to learn the social norms promoting group cohesiveness, then they will learn them more quickly and easily, so that they and the groups to which they belong will have greater inclusive fitness. Therefore, other things being equal, the genes leading to this predisposition will tend to spread more rapidly than those that make it harder for individuals to learn these norms, or are neutral with respect to them. As a consequence, over time, these norms will come to be less learned and more innate; in effect, aspects of the culture that have a selective advantage gradually come to be genetically encoded. This may sound like Lamarckian evolution, and it has a similar effect of encoding acquired traits into the genome, but in fact it is purely Darwinian natural selection.

The mechanisms underlying the Baldwin Effect have been observed in action in non-human species, where they are called *niche construction* (that is, the species and its environmental niche coevolve by influencing each other, and thus become more closely coupled; in the case of humans, the environmental niche of a group includes the culture constructed by that group, to which group members simultaneously adapt.)

The Baldwin Effect suggests an interesting interaction between archetypes and complexes, which is important for Jungian psychology. We have seen that complexes develop around an archetypal core. The Baldwin Effect shows us that over a long time (a few thousand years) certain aspects of a complex, aspects that have a selective advantage in a group's environment, may be acquired by the archetype. In effect, archetypes may evolve by elevating individually acquired characteristics to their own universal level. In

theological terms, although the gods engender the daemons, they are able to learn from those daemons who have been best at promoting the group's welfare. By doing so the gods, in effect, transform daemonic experience into divine law!

### *The Shadow Complex*

I have already mentioned the Archetypal Shadow, which incorporates behavioral dispositions rejected, in effect, by evolution. Around this archetypal core each of us develops a Shadow Complex, which comes to incorporate all the behavioral dispositions that we reject, consciously or unconsciously, in our lives. Naturally, your Shadow does not develop in isolation, but in interaction with other people, and so while some aspects of your Shadow are purely individual, others are shared with your family, community, and other groups, including the culture at large. Thus we may speak of Personal Shadow, a Family Shadow, a Community Shadow, a Cultural Shadow, and of course the Archetypal Shadow, characteristic of *Homo sapiens*. Just as it is important for a person to become acquainted with their Personal Shadow, so it is important for a nation to become acquainted with its National Shadow.

### *Family, Community, and Cultural Complexes*

As for the Superego and the Shadow, we can see that between the extremes of the personal complexes, pertaining to one person, and archetypes, shared by all people, there are complexes shared by significant groups, including the family, the community, and the culture at large. Whereas archetypes are effectively eternal, but, more precisely, change at *evolutionary* time scales, and personal complexes are born and die with the person and

change at the *biographical* time scale of individual lives, the complexes of groups change at intermediate *historical* time scales. All of these complexes may behave as autonomous personalities, possessing or projecting, and so we may speak of family daemons, community daemons, national or cultural daemons, etc.

### *The Ego*

Stevens remarks that Jung effected a “Copernican Revolution” in psychology by showing that the ego is not the center of the psyche, but just one of the many complexes surrounding the Self. Nevertheless, the ego is still of fundamental importance to us, because it is the component of the psyche most closely connected with one’s personal identity; that is, your ego is your *conscious* self (vs. the unconscious archetypal Self). However, it is difficult to state explicitly the function of the conscious ego, since in humans, like other animals, much of the business of survival and reproduction is under the guidance of the instincts (experienced as archetypes). Why has consciousness evolved at all? Here we may seek aid from evolutionary psychologists, who are attempting to understand consciousness in the context of human evolution; they have identified several functions of consciousness that are relevant to our discussion.

First, consciousness serves an important role in *voluntary action*, that is, in action that we cannot (or choose not) to perform automatically (such as most instinctive activities). To the extent that behavior is non-automatic, we need to pay attention, carefully controlling and coordinating perception and action. This is facilitated by *conscious awareness*, in which information from the various senses is integrated with recalled material, often organized around visual perception, memory, or imagination (so-

called “visual dominance” or “visual capture”). Thus the ego is a nexus for organizing these differing sources of information.

A related function of consciousness is *self-awareness*, which is your awareness of yourself as an integrated psychosomatic object, so that you can relate yourself explicitly to other objects (including other people) in the environment. For the most part, the ego is closely associated with the physical body (leaving aside out-of-body experiences and the like!), whereas the archetypes are transpersonal, and complexes are often projected onto other people.

Through this *objectification of ourselves*, our egos allow us to interpret and evaluate our own feelings and actions — which are a result of the interaction of multiple archetypes (instincts) — to learn from these experiences, so in the future we may reconcile better the contending demands of the archetypes and complexes. In this the ego may deceive itself into thinking it has more control than it actually does, and psychologists have shown that it has an enormous capacity to rationalize, after the fact, actions that it did not initiate. (It has been said that *Homo sapiens* is the *rationalizing animal!*) This brings us back to Jung’s Copernican revolution, for a better understanding of the ego’s limited knowledge and power is one of the goals of individuation.

In other words, your *ego complex* is closely related to your experience of your personal identity as an individual organism because it facilitates your behavior in your individual life. As such it must coordinate the demands and influences of the many personal complexes and of the archetypes they serve, and so it is also the locus where the competing perceptual and behavioral influences are brought together and experienced.

Indeed the ego complex develops by monitoring the consequences in experience of these influences, and it uses that experience to modulate their influences in the future. Thus the ego complex is the site of ethical decision and control (which, as already noted, is more limited than often supposed).

## 5. Conclusions

In conclusion, I hope that I have convinced you, or at least opened you to the possibility, that by combining the perspectives of Jungian psychology, evolutionary psychology, and neuroscience we can achieve a comprehensive understanding of ourselves and our world, an understanding comprehending its physical, psychological, and spiritual dimensions. So long as we hold fast to the phenomenological primacy of our lived experience, we need fear no materialist reduction of psychical reality to neuronal mechanisms or neo-Darwinian explanations of the evolution of behavior. They are complementary perspectives, from the inside and the outside, neither reducible to the other. Each perspective reveals certain aspects of the *Unus Mundus* more easily than do the others, and all may contribute to the Self's evolving awareness of its own nature. Too long we have suffered under the false dichotomy of mind and matter; it is time to transcend the opposition and discover a higher unity.

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