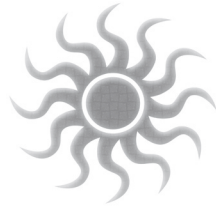


CHAPTER FIVE



A Different Kind of Quadruped

In and Out of the Trees

Long before the K-T event, one or more early mammal lines, possibly from therian stock (Fig. 5-1), began to make a living in the trees. They likely were nocturnal insectivores, relying heavily on visual sensory perception, both for locating branches for locomotion and for food acquisition. These became the first *primates*, the existence of which was quietly announced earlier. With the passing of the K-T event, at least three major primate lineages developed: one lemur-like line, the prosimians, and two simian lines – the anthropoids and the tarsiers. As was the case for many other mammal lines, they expanded rapidly in the post-cataclysmic realm. By the Eocene, 53 Ma., the primate lines had developed flat-nailed fingers with opposable thumbs and big toes, allowing both branches and food to be grasped. This reflected an increasing arboreal specialization that not only selected for longer digits but for longer forelimbs to aid in branch-to-branch movement. While this talent came at the expense of ground mobility, there was little to deter such adaptations. Within the dense rainforests of the tropics, there was little reason to leave the security of the trees; as such surrounds contained plenty of food and access to water, as well as safety from ground-dwelling predators.

Of course, with primate prosperity came with increased *primate competition*. This increased competition drove primates to expand their hours of operation. That is, by becoming active earlier in the evening and/or staying active later in the morning, species could gain access to more food. By expanding their diets to include vegetation, primates could gain access to more food. A byproduct of the latter was the evolution of color vision within primates that, not coincidentally, centers on the ranges of color

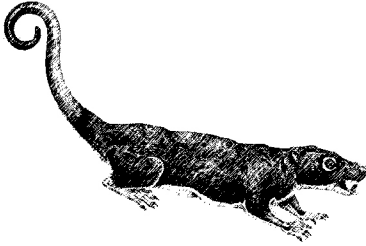


Fig. 5-1 Proto-therian Multituberculata

were regularly in close proximity to one another, it behooved all to work together for common cause *vis a vis* evading threats. The result was that all kept a look out, and if a threat was detected a warning was sent out to the others. Such behavior encouraged the members of species to stay close to one another, as those who remained isolated were the most likely to succumb to threats. With this, the “troop” would be born. Mating solidified the troop identity, with shared blood giving all concerned even more reason to look out for one another.

However, in the midst of all this cooperation was the increased competition, particularly sexual competition. Those individuals that reproduced most successfully were those that found their genes best represented in the next generation. As discussed earlier, for males, this resulted in intense competition for status, as the goal for the males of most species is to gain a monopoly on mating rights to the greatest degree possible. Females use their discerning senses to pick out which males are most worthy. For intelligent primates that were beginning to form fairly large groups, this led to a whole other type of cooperation for males: *the alliance*. Not only would a monopolization of females be difficult for any male to begin with, it would be far easier for an individual male to rise in the ranks *with help*. Meanwhile, by capitalizing on strength in numbers themselves, females could also claim a right to say which male(s) would have the mating rights, even though the average male tended to be much stronger physically than the average female. Such dynamics gave rise to “political” maneuvering within these increasingly sophisticated primate species. In turn, this created an entire new realm of selection pressure for intelligence, as knowing the personalities and motives of each individual became every bit as important as knowing their physical abilities. Indeed, “social chess” appears to drive higher intelligence considerably more than predation, which accounts for why even non-predatory primate species became remarkably bright.

It is likely that a serious catalyst for this primate competition, and for competition amongst all species for that matter, was a major climatic event that took place around 36 Ma., marking the end of the Eocene epic and

most beneficial in foraging for vegetation (this remains the case for humans, incidentally). With the increased daytime threat prevalence, especially concerning birds of prey, primate species increasingly capitalized on the fact that trees presented rather close quarters within which to operate. That is, as members of primate species

Evolved Brain Components and Function (counterclockwise progression)

Advanced mammal brain includes: **(in addition to primitive mammal brain)**

Neocortex

- Advanced sensory perception connection/integration to establish body's position in time and space, including navigation and strong vision dependence
- Advancement in working and long-term memory
- Complex emotions/rudimentary feelings
- Significant communication and cooperation within species, including high parental investment
- Rudimentary symbolic reference, imagination, consciousness

Socialized mammal brain includes: **(in addition to advanced mammal brain)**

Multilayer dorsal cortex with specialized pliability

- Powerful social emotions
- Advance feelings
- Advanced symbolic reference, imagination, consciousness
- Rudimentary symbolic communication

Primitive hominin brain includes: **(in addition to socialized mammal brain)**

Prefrontal cortex

- Advanced social feelings
- Fine motor control/facial expression
- Increased long-term memory, planning
- Rudimentary knowledge of feelings
- More advanced symbolic reference, imagination, consciousness
- Advanced symbolic communication

Advanced Hominin Brain Includes: **(in addition to primitive hominin brain)**

Prefrontal cortex

- Advanced knowledge of feelings
- Higher-level symbolic reference, imagination, consciousness
- Advanced abstraction in space and time
- Advanced symbolic communication, language

Primitive mammal brain includes: **(in addition to reptilian brain)**

Corpus callosum

- Left/right lobe connection, coordination

Cingulus Gyrus

- Advance vision and sensory interaction
- Emotion formation and processing beyond fear and anger
- Improved memory and learning inappropriate impulses
- Executive control for overriding inappropriate impulses
- Rudimentary cooperation
- Rudimentary social identification
- Significant parental investment
- Advanced indexical reference

Reptile brain includes: **(in addition to fish brain)**

Hippocampus – With long-term memory

Thalamus

- Upgraded function

Hypothalamus

Amygdala

- Emotionally charged memories
- Advanced fight or flight
- Fear and anger

Temporal Lobe

- Emotion, memory, hearing, action selection

Basal Ganglia

- Initiatory and regulatory motor commands

Diencephalon

- Hemisphere separation (proto-corpus callosum)

Proto-Neocortex (DVR) – Indexical Reference

Fish Brain Includes:

Cerebellum

- Balance and coordination of voluntary movement

Medula Oblangata

- Respiration, digestion, heart rate

Pituitary

- Hormone production

Pallium (proto-hippocampus)

- Memory formation
- Spatial orientation using optic sense

Proto-thalamus – Relay center

- Integration of exterior, interior senses and motor control

Proto-hypothalamus

- Metabolic processes, hunger, thirst
- Endocrine stimulation

Pineal Gland

- Circadian cycles

Proto-amygdala

- Memory storing, classification
- Fight or flight response
- Sense of pain

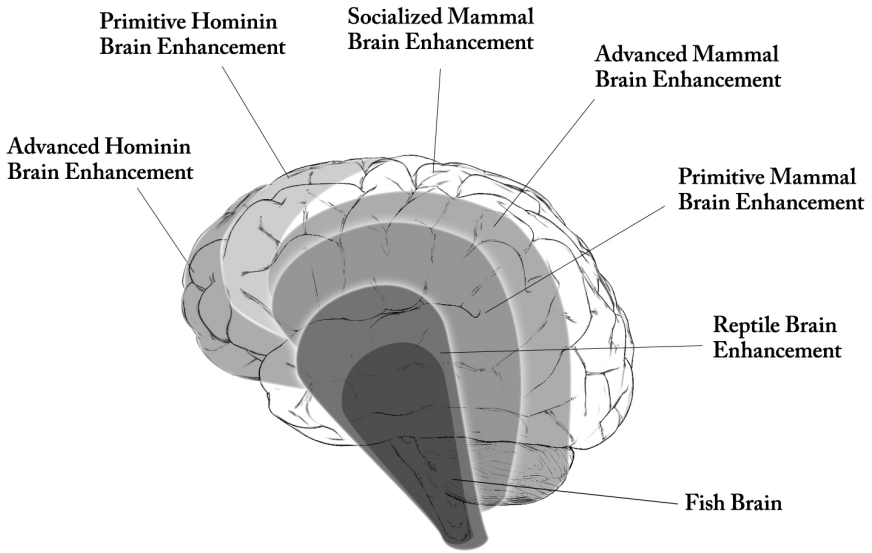


Fig. 5-3 Hierarchical Symbolic Mind Developmental Structure

Generalized hierarchical development and structure of the human brain in correlation with the greater intellectual advancement of higher-level species on earth.

The result was a developing speaking apparatus that mirrored the developing mental apparatus in protohumans, with the capacity for reason and language instincts coevolving. Both built hierarchically, an expanded capacity for reason included growing iconic and indexical reference, while an expanded capacity for speech included sound modification by the larynx, throat, tongue, palate, teeth, and lips. Tone and volume during exhalation further amplified expressive potential, while facial and body expression remained integral to the protohuman communication process.

By mixing and matching all of these mechanisms, protohumans were able to make greater and greater use of the realm of information exchange (to claim we now live in the “information age” sorely lacks *any* historical perspective, let alone a *deep* historical perspective, as information exchange is one of the most-basic SVUs). In other words, not only could the demonstrable now merely be “explained” in the name of greater efficiency. That which was difficult or impossible to demonstrate could now be conveyed to others, to both reduce the room for error and/or open up a whole new realm for achieving economic and, especially, combat/hunting objectives.

Clearly, for a species that had come to so heavily rely upon intelligence, learning, and cooperation, the development of language proved invaluable. Indeed, without language, it was impossible to share abstract concepts with others. It was even impossible to define categories or rules (via pattern seeking) concerning that which exists with any effectiveness. Thus, *any* capacity for using metaphor, inference, interpolation, extrapolation, and so on, was very limited without language.

Combined, these principles serve as the basis for both deductive and inductive reasoning skills. All of this was particularly pertinent when it came to establishing highly defined references to the past and future. In other words, language allowed protohumans to both become sophisticated historians and sophisticated planners, with the two running hand-in-hand. Thus, through language, protohumans became capable of capitalizing on cultural function and adaptivity like no species before them. Indeed, by recording past lessons in memory, and handing down the lessons learned by past generations through storytelling, human populations began to encroach upon the informational-transfer territory *once held only by genes that were modified via natural selection*. Being that greater hindsight allowed for greater foresight – yet another SVU supplied by natural selection – protohumans became extraordinarily talented planners that could allow prey and rival defenses to be soundly overcome.

With all of this in play, protohumans began to think not only in terms of words and sentences, but in terms of paragraphs, articles, short stories, and novels. In terms of making accurate predictions, an ever-growing sense of “what was” led to an ever-growing sense of “what would be.”

Over time, this capacity for abstraction produced a highly developed imagination that could conceive of possibilities without any referential precedent whatsoever.

With an expanding sense of cause and effect, the observation of the latter led to a search for the former. That is, making good use of past observations inevitably led to better future operational results, all else being equal. An expanding sense of cause and effect just as inevitably led to a sense of curiosity *vis a vis* the cause of whatever effects existed at the time for which explanations were unknown, *both in time and space*. That is, both events and physical structures became viewed as effects *that had to have causes* – immediate and, increasingly, distant – that should be decipherable. The result was the beginning of systematic reverse engineering by protohumans, *vis a vis* both the structure of the material world and the forces responsible for it. Along the way, the “hows” associated with cause and effect became accompanied by the “whys” of cause and effect.

At the same time, as is the case for all evolutionary phenomena, that which is new must be built upon that which is old. For protohumans this was no less true. Just as protohumans retained their basic physical left-right symmetry, four limbs and five digits, endothermy, and so on, all from ancient pre-hominin ancestral stock, protohumans would retain *their basic mental and emotive structure* from ancient pre-hominin ancestral stock. That is, protohumans maintained not only primate-brain architectural features, but many features that arose during original mammal, reptilian, and amphibian advances. Hence, the development of *a knowledge of feelings* for protohumans would occur, rather than knowledge *replacing* feelings in guiding protohuman behavior. The result was the conscious mind operating *in conjunction with the subconscious mind*, and the subconscious mind operating *in conjunction with primal instinct*. In short, the human mind also reflects in space the development that has taken place over time.

The human internal emergency-response system is an excellent example of how the two channels work together toward the ultimate goal of genetic survival. As part of the human fight/flight mechanism, a behavioral determination can be handled in one of two ways, depending on the circumstance. The first is through thought circuitry – conditions permitting. The second is through a thought-circuitry bypass – using downright ancient instinct-associated brain architecture,⁷ for those responses when time is of the essence and/or the consequences are sensed to be extreme.

Another way that the two systems complement each other is in the way that offspring function in higher-level species. There is no way to get around the fact that new offspring have to operate on instinct alone, as learning only comes with experience, and experience only comes with time, starting with zero in both cases. It is over time, and in some cases long

expanses of time, that the individuals of advanced species become more heavily reliant upon what is learned to deal with the threats and opportunities of life.

However, as described above, there is no species, however learned, that has a system of thought that becomes detached from emotive guidance during its lifetime. Feelings are the conscious manifestation of the emotions that occur at the subconscious level. Hence, emotions control the feelings that control what all conscious animals, including humans, think about. Thoughts – based either on new information or that stored in memory – inspire the feelings that effect emotions in reverse. Hence, as ideas are continually cycled through the virtual world of the mind, the feelings and emotions they produce dictate which ideas are settled upon. This way, ideas that seem to promise positive outcomes can be turned into action, while those that seem to promise negative outcomes can be kept from being turned into action. Indeed, the more trial and error that can be accomplished in the mind, the less trial and error that must be accomplished in the physical world. The safety and efficiency such a system can conceivably provide is obvious. Overall, it is likely that this mix of instinct and reason serves as stark confirmation of just how omnipotent the greater evolutionary force actually is.