

The Lesson¹

The school bell had just rung, and you and the other students make your way, rather hurriedly, to the desks. With the exception of a few in the back row who choose to continue their conversation, all eyes and ears focus front. Notebooks are opened to white sheets of paper. Pencils are ready. The teacher enters the classroom and the lesson begins. Lecture is augmented by demonstration. On the blackboard, the key concepts and their symbols are written down; a flow chart is sketched out. On the front desk, the panel of lights glow and electrical circuits flow with an unseen but measurable energy. Observations are made and scientific principles lead to conclusions. And the school bell rings again.

Long after the lecture is forgotten, the knowledge it conveyed can still be applied to virtually every aspect of your life. It is a knowledge that had only been dreamt by the ancients, brushing aside the superstitions and primitive beliefs they held, and providing the answers to how and why things truly are as they are. And with this knowledge of empiricism and rationalism, of rigorous human observation, reason, and intellect, is ushered forth a powerful methodology for harnessing the natural resources of the world. Electricity is at work for you and your fellow students, at a flick of a switch.

* * * * *

¹For additional background, see Hall 1983, Mathews 1989 and Nasr 1982.

In the University lab, you're closely examining the crystallized bone fragments and chipped stone. Each is considered in its archaeological context. The dating methods are applied with care—potassium argon, obsidian hydration, radiocarbon dating. You've studied primate ethology and human ethnology, and comparisons are made. From the bone and the stone, an archaeological record of human evolution is proposed.²

* * * * *

In the beginning there was a void and darkness, without form or life. Some 10 billion years ago, the primeval hydrogen gases supercondensed and exploded; the "Big Bang" had occurred. The expanding hydrogen cloud whirled about at enormous velocity and with the sudden cooling, the flying atomic particles condensed and formed the galaxies, stars and planets. On one minute object in one of those billions of solar systems something unique was to occur. Life would come forth in a very special way.

* * * * *

On a planet we call Earth, between 18 and 11 million years ago, a dog-sized, 30 pound primate inhabited the great forests of India and Africa. Traveling from tree limb to tree limb and using all four of its own limbs to do so, *Ramapithecus* (*Rama*, a Hindu God, and *pithecus*, Greek for apes) subsisted on the fruit it foraged from its forest habitat. Not particularly well-adapted to its niche, *Ramapithecus* was slow-moving, produced few offspring and with its small teeth and claws, was not well endowed to protect itself. It existed in the safety the trees offered, a forest of trees in an ever-changing physical environment.

²For additional background, see Barfield 1957, Eiseley 1957, Fagan 1989, Kroeber 1952, 1963, Levi-Strauss 1966, Nasr 1968, Smith 1976 and White 1940.

Living in a tree environment had fostered among the early primates two important adaptations--the opposable thumb and stereoscopic vision. The success in swinging from branch to branch was dependent on an ability to accurately judge the distance between branches and then to be able to firmly grab hold of a branch. Hand dexterity, eye-hand coordination, and enhanced visual perception became critical attributes of the primate.

The world for *Ramapithecus* and the other early primates was a world of praxis, of plant and animal living in interaction with the physical environment. This quadruped lived in the immediacy of its own actions and reactions to the physical events around it. Instinct, driven by natural selection, and conditioning, driven by interaction with the environment, formed the basis of its cerebral-based judgements.

This is was a world devoid of culture. For *Ramapithecus* had little capacity to create and use symbols. Without symbols, there can be no conceptualization. *Ramapithecus* had no knowledge of "self," no self awareness. It had no knowledge of "other," as a self separate from "other" creatures. It had no knowledge of "time," of its own history, destiny and mortality. *Ramapithecus* was very much a part of the natural world in which it found itself.

* * * * *

By 3 million years ago, the African forests had given way to grassland savanna. The ancestral inheritors of *Ramapithecus* found themselves in a changed environmental niche that necessitated a change in themselves if they were to survive. An adaptation of swinging through the trees no longer served the primates now roaming amongst the tall grasses. For some of those primates a unique form of adaptation was about to emerge. Those primates were known as *Australopithecus* (Latin for "South African ape") and the larger brained *Homo habilis* (Latin for "handy man").

As a consequence of the shrinking forests, there were less food stuffs available, and primates had to forage farther from home bases. Amongst the tall grasses, visibility was limited. The saber-toothed tiger could easily approach without warning. One form of

adaptation was bipedal locomotion. On two legs as opposed to four, the primate could range farther afield, see better over the tall grasses, and, with freed hands, could carry food stuffs back to a camp. There was a selective advantage among those primates who could walk upright. The hominid had emerged.

Idle hands make for the devil's work. With freed hands, in combination with the enhanced hand dexterity and eye-hand coordination that had evolved while swinging among the trees, hands could now create tools. Attempting to butcher an animal was tough going with small teeth suited for chewing, not cutting. Crude as they were, the sharp edges of stone tools allowed access to a new food source, one rich in protein and one condensed into a small, portable package. Less time was spent foraging about for food and could now be spent in other pursuits. Meat, scavenged from the kill of another animal, would now supplement plant foods. While remaining predominantly a plant eater, the size of the meat-eating primates nevertheless increased. They now stood tall at four foot and weighed up to eighty pounds.

But to fashion a stone tool, the tool must first be imagined. As crude as the tool may have been, the conceptualization of it was not. A tremendous adaptive advantage existed for those primates with an increased brain capacity. It enabled them to envision an image of a tool within a stone, to bring forth that image through the coordination of their fingers and thus release the tool from the stone, and then to communicate this entire body of "how to" knowledge to their offspring. Cranium capacity increased in *Homo habilis* to 800 cubic centimeters (a modern chimpanzee is at 300 cc and *Homo sapiens* at 1500 cc). The world of symbolic meaning had been entered. Tools of all kinds, shelter, clothing and fire were now imagined into being. And with these images came rudimentary systems of self-expression and communication. Fire soon replaced fur, and symbols gradually replaced genes as this primate's primary form of adaptation to its environment.

The erect posture had morphological repercussions for the throat of the primate. Vocal cords, tongue and larynx were stimulated, and a greater range of sounds could now be produced vocally. Speech was possible. A much more precise form of

communication resulted, and more information could be exchanged. The transmission and learning of symbols was greatly enhanced.

With erect bipedal locomotion, the pelvic structure of the primate became more massive, supporting the internal organs that now gravitated toward the lower stomach instead of from the spine. For the female pelvis, this meant that the birth canal became smaller. And together with the increased size of the cranium, young had to be born earlier, physically premature as a result. The young primate was not born autonomous, but was very dependent on others for physical survival and, most importantly, for the acquisition of an ever-expanding body of symbolic knowledge. A mother-child bonding grew. Mothers nurtured with breast and defended from beast, and taught with symbols the skills needed for survival. The seeds of social cooperation and the family were firmly planted.

In turn, with mothers spending more time with their young and less at food gathering, and with mothers less able to ward off the saber-toothed tigers with infants in arm, the mother-child bond was vulnerable. To the mother-child family was joined the male. He could help protect, and he could help secure food. The family unit was enlarged, and a male/female gender division of labor emerged. Male roles oscillated around the hunt for game animals and the protection from those animals that would hunt them, while female roles tended toward gathering plant foods and care of the young and the aged. The value of social cooperation was further enhanced.

With the tendency toward gender role specification also came a physical dimorphism. Among the males there was a marked increase in height and weight over females. Gross musculature became greater, hearts stronger and blood cells per unit volume of blood increased. More blood was lost in the hunt and in the defense from a hunt. This sexual dimorphism is unique, not exhibited by other primates.

Any view of the noble males coming to the rescue of the females and their offspring must be tempered by an understanding of the rewards of that association. Other changes were occurring in the hominid primate. There was a suppression of the estrus cycle, and females became continuously sexually active. No other primate is so oriented. The size, both in relative and absolute terms, of the male

penis became larger than any other primate, including the gorilla. With the loss of body hair and the softening of skin of the female, sexual tactility became important, again unique among primates. These are virtually the only primates to engage in face-to-face sexual intercourse. The male-female bond was strengthened because of the gratification each received from the other.

Taken altogether, the economic and survival values along with the sexual pleasures set the stage for the development of the most elaborate expression of sexual union among any animal, i.e., human courting and marriage rituals and kinship rules. For the individual of the species, there was thus an increasing sense of incompleteness and a need for the companionship only another could provide.

In addition to the cooperative male-female bonding, a significant adaptive consequence of the increased sexual activity was an increased frequency of births. The population grew. And as mothers now tended to have several infants to care for simultaneously, the association of a mother-child-father into a cooperative family unit was further enhanced.

* * * * *

For a rather timid primate, survival in the physical world depended upon being removed from that world and on creating a world of its own fabrication, an artificial environment that would mediate the forces of the natural world. It was a wondrous garment of symbolic meanings that clothed this primate, bringing forth the world of culture. Symbols replaced genes, and fire replaced fur. Beginning with *Australopithecus* and *Homo habilis*, there emerged what Loren Eiseley has called the *Dream Animal*.³

If symbols are seen as the fiber and thread, then *culture* is the fabric that clothes the Dream Animal. The cultural world of the Dream Animal, the only animal to have created an all-pervasive

³See Eiseley 1957.

conceptual world, entails social, ideological, and psychologic domains.

The social is the domain of technology, economics, politics, family, and aesthetic and religious organizations--the organizing of people's activities. Within this domain are the various modes of societal adaptation to their environments, e.g., gatherer-hunter, horticultural, agricultural, industrial; modes that have allowed the Dream Animal to inhabit virtually every environmental niche on this planet. It is the only animal capable of doing so. Out of these ecological adaptations has emerged the knowledge of technologies and sciences. From this domain dominion over the world would be sought, ever increasing the layers of the cultural garment.

The ideological is the cultural domain of awareness of and involvement in thought and spirit, in imagination and dreams. An animal gave birth to its own soul and at the same time gained awareness of its own mortality. Religions are brought forth to explain the great mysteries of the world and of life, and to bring further social control over the peoples. This is also the domain of the aesthetic, philosophical and spiritual search for meaning, identity, origins and destiny, for beauty, for love, for truth. Interestingly, the Dream Animal is the only animal who can tell a non-truth, who can lie. To lie is not just to deceive. Other animals can do that; a nesting prairie chicken darts as a decoy for its young when a coyote approaches. To lie is to conceptually and consciously choose to convey a non-truth to someone else. Despite the preponderance of cooperation and compassion shown toward its own kind, the Dream Animal is also the only species that can hate, have prejudice and kill its own kind in systematic ways, i.e., has wars.

Within the psychological domain are processes of communication and enculturation that contribute to the formation of concepts of self and other. The psychological is the domain from which roles are defined, self-esteem built and motivations directed.

The garments of the members of the Dream Animal family are fashioned in many different styles, colors and patterns. The design and particular weave for any given cultural fabric is given expression through an *ethos*. The symbols, words and images of culture embody the collective wisdom and understandings of a

particular people, in a particular landscape, in a particular interaction with their world, an ethos. Ethos embodies the collectivity of a people and a place, enshrining the imprint of rock and spirit, of technology and animal, of knowing and feeling, of humans and Gods. Cultural variation is given form.

Ethos is also the themes and motifs involving heroes and tricksters, the quests and transformations that vitalize the Dream Animal with a character and quality. Ethos is the plot of the human narrative told through the words of cultural expressions. Ethos is culture personified; the Dream Animal is imbued with persona.

Throughout the culture of the Dream Animal are values. If symbols are the fibers, culture the fabric, and ethos the weave and design, then *values* are the elasticity of the Dream Animal's garment. Values provide the flexibility and resilience, the emotional tone and moral disposition to the fiber and design. The cultural story is infused with spark and momentum, the Dream Animal with drive. Values provide emotionally-charged, moral concepts that assist the Dream Animal in making judgements and preparing for action. The garment and the Dream Animal are brought to life.

Thus, as with the individual of the species, so the species itself had a sense of incompleteness and a need for companionship. It is the companionship that only the symbolic and the cultural would provide. In the telling of its cultural story, the Dream Animal has come into being. Without *culture*, without *ethos*, without *values* there can be no Dream Animal.

But with *culture*, *ethos*, and *values*, the Dream Animal, with its remarkable intellect, is poised to secure a brave new world. It is a world of vast technologies and sciences that would reveal the very mysteries of life and death itself, controlling the former and extending the latter. It would be the world that would be extended to the microbes and subatomic, as well as the stars and beyond. It would be the world the Dream Animal would mold and fashion to its liking.

The emergence of the symbolic process in the Dream Animal does not imply that it is the only animal capable of symbolizing. Other animals certainly can. Dolphins and chimpanzees, for instance, have a rudimentary ability to use symbols. Dolphins communicate symbolically. For the chimpanzee in its natural setting, to strip the

bark from a twig and thrust the sticky twig into a termite hill, only to retrieve a food source high in protein, presupposes a symbolic ability to conceptualize the entire process prior to bringing forth the tool. What then distinguishes the Dream Animal from other animals is the degree to which the former symbolizes. Instincts derived by natural selection and behavioral conditioning resulting from interactions with the environment predominate the cerebral-based judgements of other animals, and not an ability to symbolize and fabricate an entire world of culture and story. The world of the animal is a world of signs. The world of the Dream Animal is a world of symbols, of culture, of ethos, and of values. The Dream Animal, while poised to conquer it, stands alone in a vast, inhospitable, and uncharted universe.

Extensions

Useful

Francis Bacon (1561-1623), influential in the development of the scientific revolution, maintained that only a very particular sort of knowledge is worthy of pursuing. That knowledge is technological knowledge, the knowledge of how something works. Such knowledge is less the knowledge of why something works. The distinction between applied and formal science was made. It is the knowledge that has direct application and utility for man. Born is the doctrine that what is valued and good is that which is useful to man--utilitarianism. And with this knowledge, man is given power over nature; nature will do his bidding. Knowledge is power. Because it is for man, it should be knowledge made public and shared. In 1620, Bacon published his *Novum Organum* that set out his approach to inquiry and knowledge. To acquire this technological knowledge, Bacon was among the first to propose an inductive method based on observation.

Experience

The English philosopher, John Locke (1632-1704), stated, in *Essay concerning Human Understanding*, that the mind is as a

"white paper, void of all characters, without ideas," like an "empty cabinet," as yet unfurnished. The mind is *tabula rasa*, a blank slate. The material to furnish the cabinet is the knowledge that comes from experience. For Locke, all knowledge is founded on observation, the senses. And so is founded the empirical method, i.e., "relating to experience." Knowledge is the precise correspondence between what is observed by the human senses and what exists in the natural world.

The world Locke is referring to is the natural world of physics, chemistry, biology, psychology and sociology. It is a world that exists independent of the mind, with its own structures and governed by its own processes, all of which can be discovered through rigorous observation.

The empiricist begins with observations of the natural world. These observations must be controlled, objective, verifiable and replicative. Subjectivity must be kept out. The observations are based on those senses that can be controlled and objective, i.e., sight, sound, smell, touch and taste. An example of an empirical observation would be--the walls of Jericho are 2.7 meters thick, 3.2 meters high and seven hundred meters in circumference.

The empiricist then forms a hypothesis that attempts to account for the observations. The process is called induction, i.e., reasoning from a limited number of observations to a conclusion or hypothesis. For example, the walls of Jericho are built to keep something out and to keep something safely within them.

From the hypothesis, testing begins. Deliberate, systematic experimentation and extensive observation now occur to discover if the hypothesis is indeed correct or needing revision. The hypothesis is tested. The attempt is to verify what was originally observed. Replication is the criteria for verification. At Jericho, the empiricist might observe the types of objects kept within the walls, distinct from those found outside the walls. What is observed are the trappings of a domesticated people within the walls: quantities of stored food stuffs, valuable trade items, finely crafted tools. All valuable objects. Further observation shows that these objects are not to be found among those who lived outside the walls of Jericho. This would lead the empiricist to conclude that the walls are indeed built to keep something out and to keep something safely within.

If a reasonable verification results, the empiricist then ventures a prediction of what will be discovered under similar natural circumstances. When walls similar to those at Jericho are found, they are likely built to keep something out and to keep something safely within. The strength and legitimacy of the empirical method is its ability to predict what occurs in the natural world.

Dualism

The French philosopher, Rene Descartes (1596-1650), approached knowledge from quite a different stance than did John Locke. For Descartes, man has ultimate knowledge of his own existence because he is a thinking being--*cogito ergo sum*--"I think, therefore I am." Thus the foundations of knowledge consist of a set of first, "self-evident" principles, *a priori principles*. The mind is not an empty cabinet but is filled with universal, though not readily known, principles.

Access to these first principles is not based on "the fluctuating testimony of the senses" nor on the "blundering constructions of imagination." Descartes distrusted sensory evidence as much as he avoided undisciplined imagination. The first principles are those based on "the conception which an unclouded and attentive mind gives." It is conception "wholly freed from doubt," principles derived from clear and logical thought. From these first principles, other truths can be deduced by a rigorous application of logical rules and axioms.

Knowledge is not so much what corresponds to experience but what has coherency within and among the principles and their deduced statements. And so the rational method is born. Descartes published his approach to knowledge in 1637, in *Discourse on Method*.

The rationalist begins with a set of assumptions that are hypothetically true. For instance, Jericho is a community settled by people. The walls of Jericho are defensive walls. Defense is an activity for defending something. All of these assumptions need not be verified by observation, need not exist in fact. They need only be hypothetically correct. Implicit from these assumptions, a deduction

can now be made logically. The people of Jericho have something to defend. Mathematically-rigorous formulas are applied in order to arrive at the deductions. The strength and legitimacy of the rational method is its ability to objectively think about the natural world and deduce statements of truth about that world.

* * * * *

"Examining attentively what I was, and seeing that I could pretend that I had no body and that there was no world or place that I was in, but that I could not for all that pretend that I did not exist, and that on the contrary, from the very fact that I thought of doubting the truth of other things, it followed very evidently and very certainly that I existed: while on the other hand, if I had only ceased to think, although the rest of what I had ever imagined had been true, I would have had no reason to believe that I existed; I thereby concluded that I was a substance of which the whole essence or nature consists in thinking, and which, in order to exist, needs no place and depends upon no material thing; so that this I, that is to say mind, by which I am what I am, is entirely distinct from the body, and even that is easier to know than the body, and moreover, that even if the body were not, it would not cease to be all that it is." (*Discourse on Method*, 54)

Rene Descartes made another important contribution. Descartes reasoned that if the mind is capable of clear, objective thinking, then it cannot ultimately be reducible to the influences of the material world. "Mind" and "matter" are the basic constituents of the universe. The defining characteristic of "matter" is extension and movement, i.e., the possession of dimension such as time or space. The defining characteristic of "mind" is thought, i.e., the activity of thinking. Regardless of the way "matter" is extended, e.g., straight or curved, it must be extended. Regardless of the way "mind" thinks, e.g., abstracting or imagining, it must think. Each is absolutely different from the other, requiring nothing but itself to exist. Neither has the properties of the other nor is reducible to the other, yet all in the universe is reducible to one or the other, to "mind" or "matter."

Cartesian Dualism affirms that the natural world of matter is independent of the mind, and the mind is independent of the natural world. Objectivity is possible. The world of the "other" and of man himself have become objects, for study.