



NeuroTheology

Brain, Science, Spirituality, Religious Experience



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Edited by Rhawn Joseph, Ph.D.

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PALEOLITHIC SPIRITUAL EVOLUTION

Death, The Frontal Lobe, Spiritual Symbolism

by Rhawn Joseph, Ph.D

Belief in the transmigration of the soul, of a life after death, of a world beyond the grave, has been a human characteristic for at least 100,000 years, as ancient graves and mortuary rites attest (e.g., Belfer-Cohen & Hovers, 1992; Butzer, 1982; McCown, 1937; Rightmire, 1984; Schwarcz et al., 1988; Smirnov, 1989; Trinkaus 1986). Despite their small brains and primitive intellectual, linguistic, cognitive, and mental capabilities, primitive “archaic” human beings who wondered the planet over 120,000 years ago, carefully buried their dead (Butzer, 1982; Rightmire, 1984). And like modern Homo sapiens sapiens, they prepared the recently departed for the journey to the Great Beyond: across the sea of dreams, to the land of the dead, the realm of the ancestors and the gods.

Throughout the Middle and Upper Paleolithic it was not uncommon for tools and hunting implements to be placed beside the body, even 100,000 years ago, for the dead would need them in the next world (Belfer-Cohen & Hovers, 1992; McCown, 1937; Trinkaus, 1986). A hunter in life he was to be a hunter in death, for the ethereal world of the Paleolithic was populated by spirits and souls of bear, wolf, deer, bison, and mammoth (e.g., Campbell, 1988; Kuhn, 1955). Moreover, food and water might be set near the head in case the spirit hungered or experienced thirst on its long sojourn to the Hereafter. And finally, fragrant blossoming flowers and red ocher might be sprinkled upon the bodies (Solecki, 1971) along with the tears of those who loved them.

Given the relative paucity of cognitive, cultural, and intellectual development among Middle Paleolithic Neanderthal and “archaic” humans, and the likelihood that they had not yet acquired modern human speech (Joseph, 1996, 2000a,b), evidence of spiritual concerns among these Middle Paleolithic peoples may be somewhat surprising if not unbelievable (Gargett 1989).

Neanderthals, archaics, and other peoples of the Middle Paleolithic were not very smart and used simple stones for tools. In fact, they constructed and made essentially the same stone tools over and over again for perhaps 200,000 years, until around 35,000 B.P., with little variation or consideration of alternatives (Binford, 1982; Gowlett, 1984; Mellars, 1989). Neanderthals greatly lacked in creativity, initiative, imagination, and tended to create simple stone tools that served a single purpose.

As neatly summed up by an ardent defender of Neanderthal cognitive capabilities (Hayden, 1993, p. 139), “as a rule, there is no evidence of private ownership or food storage, no evidence for the use of economic resources for status or political competition, no elaborate burials, no ornaments or other status display items, no skin garments requiring intensive labor to produce, no tools requiring high energy investments, no intensive regional exchange for rare items like sea shells or amber, no competition for labor to produce economic surpluses and no corporate art or labor intensive rituals in deep cave recesses to impress onlookers and help attract labor.”

Neanderthals tended to live in the “here and now,” with little ability to think about or consider the distant future (Binford, 1973, 1982; Dennell, 1985; Mellars, 1989, 1996); the only notable exception, the future life after death.

This notable dichotomy is in part a function of the differential evolution of the frontal versus the temporal lobes. The frontal lobes are the senior executive of the brain and are responsible for initiative, goal formation, long term planning, the generation of multiple alternatives, and the consideration of multiple alternative consequences (Joseph, 1986a, 1988a, 1999b). The frontal lobes are the source of creativity and imagination, whereas the temporal lobes are the seat of the soul. It is the temporal lobes which were maximally developed in archaic and Neanderthals, whereas the frontal lobe would increase in size by a third in the transition from archaic humans to Cro-Magnon woman and man.

Based on a gross analysis of the skull and casts made of the inner surface of the skull as well as other evidence some of which will be reviewed here, it is apparent that “archaic” Neanderthal men and women possessed a well developed inferior temporal lobe whereas the frontal lobe is sloped and stunted (Joseph, 1996, 2000a). It is the temporal lobes, and the limbic structures buried within which



are directly implicated in the generation of personal, emotional, and religious experience including the ability to form long term emotional attachments and to feel intense love (Gloor, 1997; Joseph, 1992a; MacLean, 1990).

In fact, Neanderthals provided loving care for friends and family who had been injured or maimed, enabling them to live many more years despite their grievous injuries. For example, the skeleton of one Neanderthal male, who was about age 45 when he died, had been nursed for a number of years following profoundly crippling injuries. His right arm had atrophied, and his lower arm and hand had apparently been ripped or bitten off, and his left eye socket, right shoulder, collarbone, and both legs were badly injured. Obviously someone loved and tenderly cared for this man. He was no doubt a father, a husband, a brother, and son, and someone in his family not only provided long term loving care to make him comfortable in this life, but prepared him for the next life as well.

Neanderthals were unable to fashion complex tools or think complex thoughts, yet they were people of passion who experienced profound emotions and love; made possible by the limbic system and temporal lobe. In fact, it is because they had the limbic capacity to experience love, spiritual awe, and religious concerns, that these expressions of love continued beyond death. Thus the Neanderthals carefully buried their dead, providing them with food and even sprinkling the bodies with seven different types of blooming, blossoming, fragrant flowers.

THE ANTIQUITY OF THE SOUL

MIDDLE PALEOLITHIC SPIRITUALITY

When humans first became aware of a “god” or “gods” cannot be determined. Nevertheless, the antiquity of religious and spiritual belief extends well beyond the course of the last 100,000 years, as it has been well established that Neanderthals and other Homo Sapiens of the Middle Paleolithic (e.g. 150,000 to 35,000 B.P.) and Upper Paleolithic (35,000 B.P. to 10,000 B.P.) engaged in complex religious rituals. These rituals are evident from the manner in which they decorated their caves and the spiritual symbolism associated with death.

Neanderthals (a people who lived in Europe, Russia, Iraq, Africa, and China from around 150,000 to 30,000 B.P.), have been buried in sleeping positions with the body flexed and lying on its side. Some were laid to rest with limestone blocks placed beneath the head like a pillow—as if they were not truly dead but merely asleep.

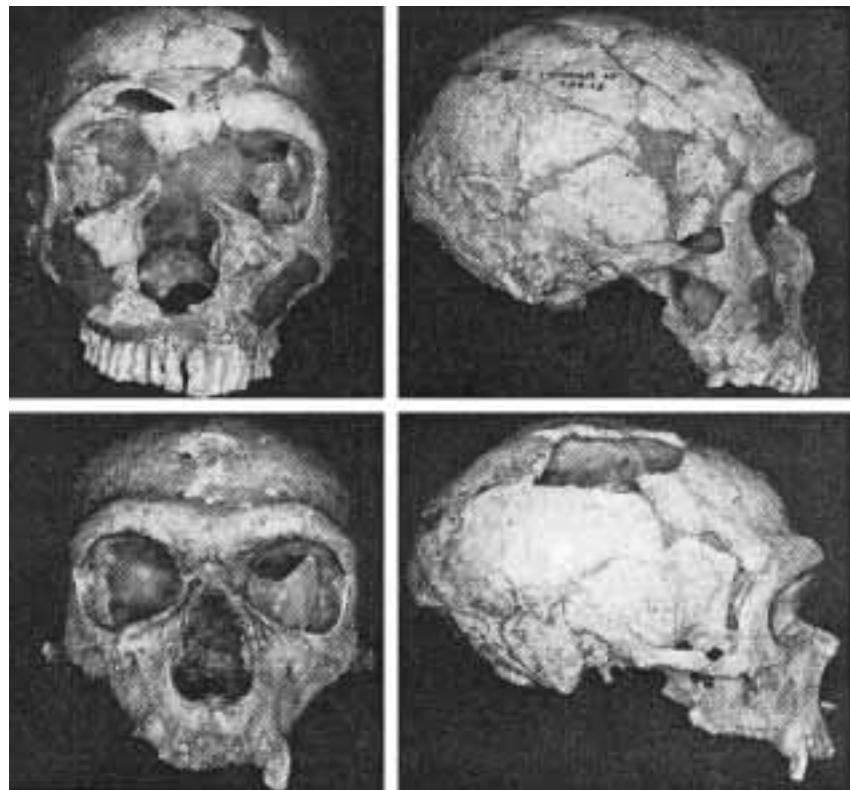
Sleep and dreams have long been associated with the spirit world, and it is through dreams that gods including the Lord God worshipped by Jews, Christians, and Muslims, have communicated their thoughts, warnings, intentions, and commands. Throughout the ages, and as repeatedly stated in the Old Testament and the Koran, dreams have been commonly thought to be the primary medium in which gods and human interact (Campbell 1988; Freud, 1900; Jung 1945, 1964). Insofar as the ancients (and many moderns folks) were concerned, dreams served as a doorway, a portal of entry to the spirit world through which “God,” His angels, or myriad demons could make their intentions known.

It is through dreams, we are told, that one is able to come into direct contact with the spirit world and a reality so magical and profoundly different yet as real as anything experienced during waking. It is through dreams that ancient humans came to believe the spiritual world sits at the boundaries of the physical, where day turns to dusk, the hinterland of the imagination where dreams flourish and grow. And it is while dreaming that one’s own soul may transcend the body, to soar like an eagle, or to commune with the spirits of loved ones who reside in heaven along side the gods.

Neanderthals prepared their dead for this great and final journey, by laying their loved ones to rest so that they would sleep with the spirits and dream of heavenly eternity.

Neanderthals have also been buried surrounded by goat horns placed in a circle, with reindeer vertebrae, animal skins, stone tools, red ochre, and in one grave, seven different types of flowers. In one cave (unearthed after 60,000 years had passed), a deep chamber was discovered which housed a single skull which was surrounded by a ring of stones.

Yet others were buried with large bovine bones above the head, with limestone blocks placed on top of the head and shoulders, and with heads severed coupled with evidence of ritual decapitation, facial bone removal, and cannibalism (Belfer-Cohen and Hovers 1992; Binford 1968; Harold 1980; Smirnov 1989; Solecki 1971). In one site, dated to over 100,000 years B.P., Neanderthals decapitated eleven of their fellow Neanderthals, and smashed their faces beyond recognition.



Above: Neanderthal tools.

Figure 98. Top: Two well preserved crania from northern European male Neanderthals. Reproduced from M. H. Wolpoff (1980), *Paleo-Anthropology*. New York, Knopf.
Above: The head and torso of a Neanderthal. Reprinted from Howells, 1997. *Getting Here*. Compass Press, Washington D.C.



Figure 99. A Neanderthal seemingly glowers from the grave at those who have disturbed his long slumber. His body had been sprinkled with 7 different types of flowers. Reproduced from R. Solecki. *Shanidar: The first Flower people*. New York, A.A. Knopf.



Figure 100. Neanderthal burial.



Moreover, Neanderthals buried bears at a number of sites including Regourdou. At Drachenloch they buried stone "cysts" containing bear skulls (Kurten 1976); hence, "the clan of the cave bear."

It therefore seems apparent that Neanderthals not only engaged in complex religious rituals, but they believed in spirits, ghosts, and a life after death. Hence the sleeping position, stone pillows, stone tools and food. They were preparing the departing spirit for the journey to the Hereafter and the land of dreams.

It also appears that they feared the dead, and were terrified by the prospect that certain souls might haunt the living. They were afraid of ghosts, and frightened by the possibility that just as one might awake from sleep after visiting the land of the dead, the dead might also awake from this death-like slumber. The dead, or at least their personal souls, had to be prevented from causing mischief among the living; especially the dead of dreaded enemies. Hence, the ritual decapitation, facial bone removal, and placement of heavy stones upon the body.

It can be concluded, therefore, that almost 100,000 years ago, primitive humans had already come to believe in ghosts, souls, spirits, and a continuation of "life" after death. And, they also took precautions, in some cases, to prevent certain souls from being released from the body and returning to cause mischief among the living.

Moreover, they appear to have believed in a personal soul, which is why, in the case of powerful enemies, the Neanderthals would cut off heads and hands. They went to great lengths to obliterate all aspects of that dreaded individual's personal identity; e.g., smashing the face beyond recognition.

Of course, the fact that these Neanderthals were buried does not necessarily imply that they held a belief in "God." Rather, what the evidence demonstrates is that Neanderthals were capable of very intense emotions and feelings ranging from murderous rage to love to spiritual and superstitious awe. Although no god is implied, Neanderthals held spiritual and mystical beliefs involving the transmigration of the soul and all the horrors, fears, and hopes that accompany such feelings and beliefs. Although the Neanderthals had not discovered god, they stood upon the threshold.

THE NEANDERTHALS: A CHARACTER STUDY

What is most surprising about the depth of Neanderthal spirituality is the fact that these were an exceedingly violent, murderous people, as the remnants of their skeletons preserved for so many eons attests. Many of their fossils still betray the cruel ravages of deliberately and violently inflicted wounds.

They also appear to have systematically engaged in female infanticide, and displayed a willingness to eat almost anything on four or two legs—including other Neanderthals. In one site, dated to over 100,000 years B.P., Neanderthals decapitated eleven of their fellow Neanderthals, and then enlarged the base of each skull (the foramen magnum) so the brains could be scooped out and presumably eaten. Even the skulls of children were treated in this fashion.

In fact, they would throw the bones and carcasses of other Neanderthals into the refuse pile. In one cave, a collection of over 20 Neanderthals were found mixed in with the remains of other animals and refuse. Presumably, these were enemies or just hapless strangers, innocent cave dwellers who were attacked and sometimes eaten after being brutally killed.

Hence, with the obvious exception of "friends," mates, and family, Neanderthals often saw one another as a potential meal, and had almost no regard for a stranger's innate humanness. These were a violent, murderous, ritualistic people, and strangers were often killed and eaten.

These characteristics are also associated with religious fervor. Among ancient and present day peoples, violence, murder, ritual cannibalism, and the sacrifice of children are common religious practices.





Violence and murder are also under the control of the limbic system. And it is the limbic system which mediates religious and spiritual experience.

ARCHAIC SPIRITUALITY AND MORTUARY RITUALS

The Neanderthals were not a very intelligent or tidy people. Yet they possessed a well developed limbic system and temporal lobe. In fact, from an examination of fossilized skulls, it appears that other archaic Homo sapiens, including the still primitive “early modern” Homo sapiens of the Middle Paleolithic were well endowed in this regard, though the frontal lobe remained poorly developed (Joseph, 1996, 2000a,b).

By contrast, the temporal lobe began to expand and evolve at a faster and earlier rate than the frontal lobe (Gloor, 1997), which is a characteristic of ontological development as well (Joseph, 1982, 2000a).

It is the expansion of the temporal lobe, this “transmitter to god” which also explains why even earlier species of primitive humanity practiced complex spiritual rituals and mortuary rites. “Early modern,” and other “archaic” Homo sapiens commonly buried infants, children, and adults with tools, grave offerings, and animal bones.

For example, archaic H. sapiens and “early moderns” were carefully buried in Qafzeh, near Nazareth and in the Mt. Carmel, Mugharet-Skhul caves on the Israeli coast over 90,000 to 98,000 years ago (McCown 1937; Smirnov 1989; Trinkaus 1986). This includes a Qafzeh mother and child who were buried together, and an infant who was buried holding the antlers of a fallow deer across his chest. In a nearby site equally as old (i.e. Skhul), yet another was buried with the mandible of a boar held in his hands, whereas an adult had stone tools placed by his side (Belfer-Cohen and Hovers 1992; McCown 1937).

NEOLITHIC MORTUARY PRACTICES

It is unknown if the burial practices of the Paleolithic peoples included burning, as is common in many ancient and present day cultures (e.g. India). There is ample evidence, however, that burning was a widespread custom during the Neolithic. In some cases, only the bones were buried, which indicates that either the body was burnt, or it was only buried after the flesh had rotted away; referred to by anthropologists as a “secondary burial.”

Like those who came before them, the mortuary practices of the Neolithic peoples, such as those living in predynastic Egypt, included the burial of loved ones in sleeping positions, often lying the dead on their left side (Budge, 1900; Hoffman, 1991). The dead “sleeping” body would also be buried with substantial grave goods including surplus wealth.

“The deceased were laid on reed mats and invariably accompanied by grave offerings that reflected their relative wealth and aspects of daily life. These included tools, flint knives, scrapers, arrowheads, ornaments like shell and stone beads, and a bewildering variety of fine, handmade polished red ware jars, backed clay figurines, amulets, and carved ivory plaques” (Hoffman, 1991, p. 110).

Moreover, just as Paleolithic peoples also sometimes took steps to prevent the souls of the dead from returning to haunt the living, or to take up residence in the dead bodies, those of the late Upper Paleolithic and early Neolithic did likewise. For example, the dead might be buried covered with huge stone slabs and with heads, arms, hands and feet missing, and/or impaled with weapons (Budge, 1900).

Mortuary rites and religious rituals have therefore been practiced the world over, from the Middle Paleolithic to the Upper Paleolithic to the Neolithic and beyond to the present. For over 100,000 years humans have buried and wept over their dead, have believed in spirits and a life after death, and have provisioned their souls for the journey to the Hereafter.

We may be born of the flesh, but we are spiritual beings. Spirituality has been a defining aspect of the human condition for over 100,000 years.

CRO-MAGNON GENESIS: The Children of the Gods

Biblical accounts of creation tell us that increasingly complex life forms emerged upon the planet, in a step-wise, “day to day” sequence, beginning with simple creatures and culminating, on day 6, with the creation of woman and man. In fact, this same progression is evident from the fossil



record, and was first detailed in the Sumerian accounts of Genesis.

Almost 6000 years ago the Sumerians, a cultured people whose cities and civilization eventually gave rise to Babylon, explained that the first humans were exceedingly “primitive” and unsuitable to perform the work required by the gods. The gods required intelligent and skilled workers to tend their farms and gardens.

According to the ancient Sumerians, Enki, the Anunnaki god of science and wisdom, decided to rectify the situation by taking tissue from the gods, mixing it with other substances, so as to create the first true human beings; humans that were fashioned in the image of the gods and provided the spirit, the living soul of god. Enki’s emblem was the sign of the double helix, two entwined snakes.

The Biblical account in Genesis echoes the Sumerian account: “And God said, Let us make man in our image, after our likeness. So God created man in his image, in the image of God created he him; male and female he created them.”

In the account provided by Genesis there is also a second act of human creation by a “Lord God.” This Lord God appears upon the scene after “God ended his work... and rested on the seventh day.”

As the men and women created on the sixth day were not suitable to farm the land or manage his herds, the “Lord God” engaged in another act of creation because “there was not a man to till the ground... And the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life; and man became a living soul. And the Lord God planted a garden eastward in Eden and there he put the man whom he had formed.”

Thus we see that the man created after the seventh day differs from the man created on the sixth day, in two important respects. The man created on the sixth day, was created by “God,” as part of a natural progression beginning with simple creatures. This first man, however, was unable “to till the land.” The man fashioned after the seventh day, after “God” had rested, was created by the “Lord God” after all the natural sequential acts of creation had come to an end. And, this new man, created after the seventh day was able to till the gardens, and was provided with a “living soul.”

Because the Earth was already swarming with these more primitive humans, Cain (the son of Adam and Eve) worried aloud to the Lord God, that he may be killed: “I shall be a fugitive and a vagabond in the earth; and it shall come to pass that everyone that findeth me shall slay me... And the Lord set a mark upon Cain, lest any finding him should kill him” (Genesis, 4: 14-15).

Thus we may presume that the first men and women did not possess a “living soul,” were exceedingly primitive and violent, and lacked the intellectual capability to perform the tasks assigned—at least, as stated by the Sumerians and echoed in Genesis. “There was not a man to till the ground.” They were like animals. They had no souls.

By contrast, the second creation resulted in men and women who were not only created in the image of the Gods, but who were highly intelligent, and who received something of God, becoming a “living soul.” Unlike the men and women created on the sixth day, this newly created woman and man were so creative, intelligent, and demonstrated such wisdom, that the “the Lord God...” proclaimed “man had become as one of us, to know good and evil.”

THE CRO-MAGNON

The Cro-Magnon were a very handsome people with thin hips, broad shoulders, aquiline noses, prominent chins, small even perfect teeth, high rounded foreheads, and with brains almost a third larger than those of the average woman and man today, i.e. 1800 cc vs 1350 ccs. There was nothing ape-like or Neanderthal about these people.

These were a tall and noble looking race. Consider, whereas the average height of a present day male averages (depending on country) from between five foot four to five foot 9 inches, Cro-Magnon men stood 6 foot tall, though the women were somewhat smaller and more delicate. Compared to those who came before or after them, and until the advent of the 20th century, these people were giants and they may well have appeared as “gods;” at least to the Neanderthals who managed to hang on for another 10,000 years after the Cro-Magnons had appeared upon the scene. In fact, it was not until the 20th century and with significant changes in nutrition and diet that people in the Western world grew by almost half a foot in height, the men reaching five feet nine inches on average.

The Cro-Magnon were also intellectual giants. They were accomplished artists, musicians, craftsmen, sorcerers, and extremely talented hunters, fishermen, and highly efficient gatherers and herbalists. When they emerged upon the scene over 35,000 years ago, they carried and fashioned tools and weapons that had never before been seen. They had the know how to make and bake pottery



and construct clay figurines as well as construct kilns and burn coal so as to fire and mold their creations.

From the time of Homo Erectus (1.9 million to 500,000 B.P), humans had utilized fire to keep warm, to provide light, to cook their food, and to ward off animals. However, the Cro-Magnon learned over 30,000 years ago how to make fire using the firestone; iron pyrite which was repeatedly struck with a flint thus making sparks which could easily ignite brush.

They also created the first rudimentary blast furnaces which were capable of emitting enormous amounts of heat, so as to fire clay. This was accomplished by digging a tiny tunnel into the bottom of the hearth which allowed air to be drawn in. Indeed, 30,000 years ago these people were making fire hardened ceramics and clay figures of animals and females with bulging buttocks and breasts—which are presumed to be the first goddesses.

Many of these female figurines were shaped so that they tapered into points. Because they were pointed they could be stuck into the ground or into some other substance either for ornamental or supernatural purposes, e.g., household goddesses or as fertility figures and earth mothers. In fact, much of the art produced, be it finely crafted “laurel leafs” or other artistic masterpieces, served ritual, spiritual, and esthetic functions. However, they also created art that was meant to be looked at, owned and admired, and for trade, as jewelry and household decorations, and as highly prized possessions as well as for religious reverence.

Likewise, the first musical instruments were created by these people some 25,000 years ago. These included wooden drums and tiny flutes and whistles.

These peoples were also the first to weave baskets, and the first to use needle and thread in order to make finely fitted clothes which were carefully and deftly sewn together. Unlike all those who had come before them they decorated their clothes and tools and weapons with elaborate designs and geometric and animal symbols. Within their underground cathedrals they left behind elaborate and complex paintings, some of which were almost 3-dimensional. These peoples demonstrated an esthetic artistic awareness and mastery that was unprecedented and which equals the ability of any living artist today.

Thirty five thousand years ago, Cro-Magnon were painting animals not only on walls but on ceilings, utilizing rich yellows, reds, and browns in their paintings and employing the actual shape of the cave walls so as to conform with and give life-like dimensions, including the illusion of movement to the creature they were depicting. Many of their engraving on bones and stones also show a complete mastery of geometric awareness and they often used the natural contours of the cave walls, including protuberances, to create a 3-dimensional effect.

The drawing or carving often became a harmonious or rather, an organic part of the object, wall, ceiling, or tool upon which it was depicted. The Cro-Magnon drew and painted scenes in which animals mated, defecated, fought, charged, and/or were fleeing and dying from wounds inflicted by hunters. The Cro-Magnon cave painters were exceedingly adept at recreating the scenes of everyday life. Moreover, most of the animals were drawn to scale, that is, they were depicted in their actual size; and all this, 35,000 years ago (e.g. Chauvet, et al., 1997).

The Cro-Magnon obtained their colors from natural earth pigments, such as ocher, a clay that contains a variety of iron minerals. However, whereas Neanderthals and H. habilis apparently had a fondness for red, the Cro-Magnon learned to separate and mix these pigments creating a variety of hues and colors. In order to mix and to arrive at the correct consistency, a variety of lubricants were employed such as blood, urine, vegetable and fruit juices, animal fat, and the contents of eggs. The separate colors were then mixed in various hollowed out rocks and shells.

The Cro-Magnon artist used a brush, as well as his or her fingers in order to paint. In fact, they used a variety of different brushes which enabled the artist to create different shades and strokes. In some cases the artist simply blew the paint onto the drawing via a tubular bone, thus making a mist-like spray.

The Cro-Magnon artists had also invented abstract impressionism, as many of their paintings and artworks were exceedingly abstract, surrealistic, or comprised of geometric forms and concentric shapes and ovals which in some cases formed abstract versions of animals or women. Indeed, they displayed an artistic mastery equal to that of any modern master, including Picasso. Awe struck by these Paleolithic masterpieces Picasso complained that in 30,000 years “we have learned nothing new. We have invented nothing.” Indeed, the geometric and angular form of representation employed by these Paleolithic Masters appears again and again throughout history and is found in Egyptian, Sumerian, and even early Greek art.

The origins of the Cro-Magnon peoples, however, are completely unknown. There are no tran-



sitional forms that link them with Neanderthals or the still primitive “early modern” peoples of the Middle Paleolithic who were decidedly more archaic in appearance. Neanderthals did not evolve into Cro-Magnons, and they coexisted for almost 15,000 years, until finally the Neanderthals disappeared from the face of the Earth, around 30,000 years B.P. (Mellars, 1996). Indeed, the Neanderthals were of a completely different race; and not just physically, but genetically, for when they died out, so too did their genetic heritage and all traces of their DNA (Ovchinnikov et al., 2000).

By contrast although modern human DNA differs significantly from Neanderthal DNA, “modern” human DNA traces its ancestral lineage to female ancestors who lived around 250,000 years ago (Stoneking & Cann, 1989; Vigilant et al. 1991). Likewise, according to the Sumerian Kings’ lists, the Anunnaki created the first god-like humans around 240,000 years ago (Roux, 1992) when Enki implanted a mixture into a female goddess who gave birth to the first man.



Figure 101. Upper Paleolithic Cro-Magnons buried with tools, ornaments, hunting implements, and other essentials.



Figure 102. Upper Paleolithic Cro-Magnons buried with tools, ornaments, hunting implements, and other essentials.



Thirty thousand years ago, and with the demise of the Neanderthals, the Cro-Magnons gained dominion over the earth. And it is thirty thousand years ago that the ancient Egyptians claim that first kings came to rule Egypt, and that these kings were gods.

In comparison to all those who had come before them, and the Neanderthals who still lived in adjacent lands, the Cro-Magnon were so physically, intellectually, technologically, culturally and genetically advanced, and had such a huge brain, and they appeared so suddenly upon the Earth, that they may well have been created by God and in the image of the Gods... knowing good and evil.

CRO-MAGNON UPPER PALEOLITHIC SPIRITUALITY

The brain of the Cro-Magon differ from previous species of humanity and other primates and mammals, in that the frontal lobe has significantly increased in size (Joseph, 1996). The frontal lobe is the “senior executive” of the brain and personality, and among its many functions are the capacity for creative and symbolic thought--to put into thought and to act out limbic and spiritual impulses (Joseph, 1986a, 1999c).

The spiritual belief systems of the Cro-Magnon and other peoples of the Upper Paleolithic, completely outstripped those of their predecessors in complexity, originality, and artistic and symbolic accomplishments. As the brain and man and woman evolved, so too did their spiritual beliefs.



Hence, the Cro-Magnon conception of, and ability to symbolically express the spirit world, became much more complex as well, undergoing what has been described as a “symbolic explosion” (Bandi 1961; Kuhn 1955; Leroi-Gurhan 1964, 1982; Prideaux 1973).

The Cro-Magnon practiced complex religious rituals and apparently were the first peoples to have arrived at the conception of “god.” However, it was not a male god who they worshipped but female goddesses who were attended by animals and animal-head shaman.

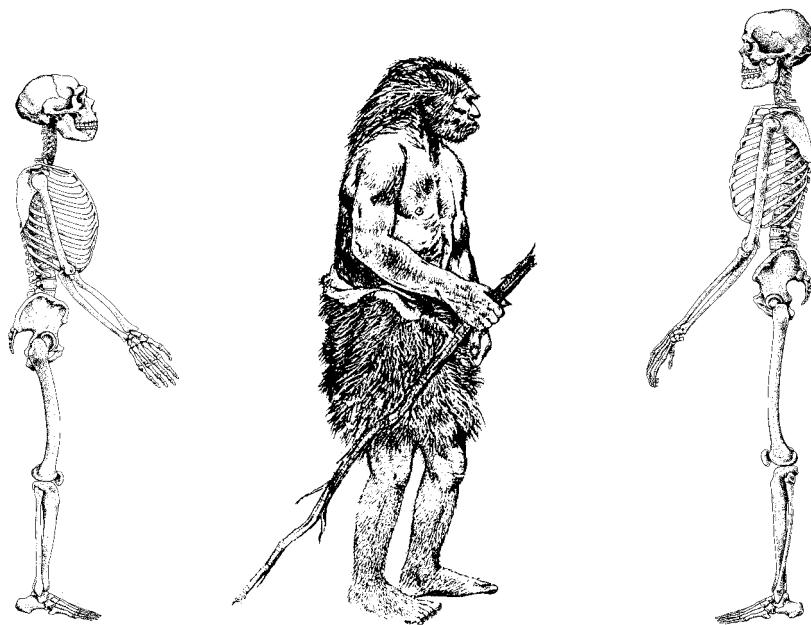


Figure 103. Neanderthal skeleton, Neanderthal, and a Cro-Magnon skeleton.

By 35,000 years ago the Cro-Magnon were painting, drawing, and etching bear and mammoth, deer and horse, and pregnant females and goddesses in the recesses of dark and dusky caverns (Bandi 1961; Chauvet et al., 1996; Leroi-Gurhan 1964, 1982; Prideaux 1973). The pregnant females include Venus statuettes, many of which were fertility goddesses. The Cro-Magnon were well aware of the differences between a slim sexy woman and a fertility Goddess for they were able to draw both. In fact, these were the first people to paint and etch what today might be considered Paleolithic porn. That is, in addition to pregnant fertility goddesses they drew and painted slim, shapely, naked and nubile young maidens in various positions of repose (Joseph, 1993, 2000a).

It is noteworthy that even 35,000 years ago and continuing for the next 25,000 years, the Cro-Magnon artist often drew and painted over existing drawings, including paintings which were hidden away in deep recesses of dark underground caverns that were extremely difficult to get to. This indicates that the location within the cave was of particular mystical, spiritual, or at least ritualistic significance, particularly in that many paintings were in out of the way places where one had to crawl long distance through tiny spaces and along rather tortuous routes to get to them. In fact, not just the location but the journey to these hidden recesses may have been of ritualistic significance perhaps relating to birth or even rebirth following death.

SPIRITS, SOULS, AND SORCERERS

As is evident from their cave art and symbolic accomplishments, the nether world of the Cro-Magnon and other peoples of the Upper Paleolithic, was haunted by the spirits and souls of the living, the dead, and those yet to be born, both animal and human (Brandon 1967; Campbell 1988; Kuhn 1955; Prideaux 1973).

Upper Paleolithic peoples apparently believed these souls and spirits could be charmed and controlled by hunting magic, and through the spells of sorcerers and shamans. Hence, in conjunction with the worship of the goddess, the Cro-Magnons also relied on shamans and priests.

Hundreds of feet beneath the earth, the likeness of one ancient shaman attired in animal skins and



stag antlers, graces the upper wall directly above the entrance to the 20,000-25,000 year-old grand gallery at Les Trois-Freres in southern France (Prideaux 1973). Galloping, running, and swirling about this ancient sorcerer are bison, stag, horse, deer, and presumably their spirits and their souls. Images of an almost identical “sorcerer” appear again in ancient Sumerian and Babylonian inscriptions fashioned four to six thousand years ago. The “sorcerer” has a name: “Enki”—the god of the double helix.

The Cro-Magon also believed in and worshipped the goddess who was associated with the fertility of the earth, as well as the moon and the stars. One great goddess was carved in limestone over the entrance to an underground cathedral in Laussel, France, over 25,000 years ago. She was painted in the colors of life and fertility, blood red. Her left hand still rests upon her pregnant belly whereas in her right hand she holds the horned crescent of the moon which is engraved with thirteen lines, the number of moon cycles in a solar year. She was a goddess of life, linked to the mysteries of the heavens and the magical powers of the moon whose 30 day cycle corresponds with the menstrual cycle which issues from a woman’s life giving womb. The Cro-Magnon believed in god. God was a woman.

UNDERGROUND CATHEDRALS: EMBRACED BY THE LIGHT

In order to view many of these Cro-Magnon paintings and “religious” statues and shrines, one has to enter the hidden entrance of an underground cave, and crawl a considerable distance, sometimes hundreds of yards, through a twisting, narrowing, pitch black tunnel before reaching these Upper Paleolithic underground Cathedrals. Here the Cro-Magnon would light candles and lamps, performing magical and spiritual rituals as the painted animals and spirits wavered in the cave light.

The nature and location of the Cro-Magnon cathedrals, which have been found throughout Europe, and the nature of the tortuous routes to get to them, and the effect of cave light bringing these paintings to life, is significant as it embraces features associated with after death experiences as retold by present day as well as ancient peoples.

In the ancient Egyptian and Tibetan Books of the Dead, and has been reported among many of those who have undergone a “near death” or “life after death” experience, being enveloped in a dark tunnel is commonly experienced soon after death. It is only as one ascends the tunnel that one will see in the decreasing distance, a light, the “light” of “Heaven” and of paradise. Once embraced by the light “the recently dead” may be greeted by the souls of dead relatives, friends, and/or radiant human or animal-like entities (Eadie, 1992; Rawling 1978; Ring 1980).

Given the nature of their rituals, shamanic images, and goddess figurines, including the symbolism of flight associated with death, it thus appears that the Cro-Magnon were probably the first people to engage in magic and sorcery and may have been the first to develop notions of heaven and god and goddesses and the first to invent priests and shamans.

And, because the Cro-Magnons obviously believed in an after-life, they buried their dead with food, weapons, flowers, jewelry, clothing, pendants, rings, necklaces, multifaceted tools, head bands, beads, bracelets and so on. The Cro-Magnon were a profoundly spiritual people and they fully prepared the dead for the journey to the spirit world, equipping them so that they could live for all eternity in the land of the gods.

CRO-MAGNON GODS IN THE GARDEN OF EDEN

MAN THE HUNTER

The achievements of the Upper Paleolithic Cro-Magnon were not merely limited to art, ceramics, music, and spirituality, as they constantly experimented with and created new inventions such as the sewing needle, pointed burins, highly efficient cutters and scrapers, and the spear thrower. This device consisted of a spear that was fitted into a long hooked rod, about 1-2 feet in length.



Figure 104. Cro-Magnon art.



Via the spear thrower a Cro-Magnon hunter or warrior could toss his weapon an incredible distance and at a tremendous velocity thus greatly enhancing his killing power and range. In effect, the spear thrower acted as an extension of a man's arm and enabled a man to almost double the distance in which he could throw a spear. He could easily impale and kill an animal or another man standing anywhere from 70 to 150 yards away.

Like all their tools, the spear throwers were elaborately decorated with fine carvings, etchings, drawings and paintings of animals such as horses, deer, bison, birds and fish. These tools and weapons were also made from a variety of substances such as reindeer antlers..

These people also realized that a spear covered with barbs, harpoon style, would do much more damage than a smooth point. However, even with barbs, animals often were not killed outright and the mortally wounded beast would sometimes run for miles before falling down and dying. The Cro-Magnon, therefore, created blood grooves along side the bone spearheads so that blood could more efficiently gush from the wound thus speeding the process of dying.

In addition, perhaps 20,000 years ago the first bows and arrows apparently came into widespread use and the arrows appear to have been feathered so as to stabilize their flight. With the creation of the bow the hunter could now remain completely hidden for if he missed with his first shot the animal would not even know he was there (so long as he stayed down wind and out of sight). The hunter could now shoot again and again.

The Cro-magnon were the greatest hunters of their time and unlike those who came before them, they were able to easily kill antelopes, bison, wild horses, reindeer, mammoths, and even lions and bears. They were also good trappers and fisherman and took birds, small animals and fish in abundance. In fact they were the first true fishermen and constantly harvested the abundant game living in the lakes, rivers and seas. These people utilized nets, a trident shaped spear as well as a baited hook which would then become lodged in the throat of the fish.

Diversity in tool making is the hall mark of the Cro-Magnon. Thirty five thousand years ago, a typical tool kit consisted of well over 125 items, e.g. knives for cutting, whittling, stone saws, chisels, perforators for making holes, needles, scrapers for bone others for skin, pounding slabs, etc.. Many of these tools were attached to wood, bone and antler handles, and/or were made of these materials including ivory. Ivory can also be steamed and bent so that specific shapes can be molded.

In contrast, the Neanderthal and those who came before them, simply knocked two stones together so as to sharpen a rock, or they chipped away flakes from rocks and used these as cutting tools and weapons. Compared to the Neanderthals, Cro-Magnons were like gods.

GODDESS: WOMAN THE GATHERER

By the dawn of the Upper Paleolithic hunting had become the center of religious and artistic life for the men. Nevertheless, 60-80% of the Cro-Magnon diet consisted of fruits, nuts, grains, honey, roots and vegetables (Clark, 1952; Prideaux, 1973), which were gathered by females (Joseph, 2000b). Among the hunting and gathering societies in existence during the last few centuries, women have been and are the gatherers and main providers of food whereas spoils from the hunt account for only about 35% of the diet (Dahlberg, 1981; Lee & DeVore, 1968; Martin & Voorhies, 1975; Murdock & Provost, 1973; Zilman, 1981).

Gathering was also a spiritual affair which unlike hunting and the taking of life, celebrated the nurturance and giving of life and life's abundance. These Paleolithic women likely gathered in groups of 7 or more adults. The Cro-Magnon woman did not just gatherer the produce from the Garden of Eden, but she experimented with horticulture, herbology, and the fertility of the Earth.

Man the hunter, woman the gatherer and giver of life, has characterized the psychic and spiritual dichotomy of the human condition since well before the Paleolithic. Yet, with the arrival of the Cro-Magnon, woman became a tool-making, gathering goddess and mistress of the hearth and the hunt. And woman, the first god, was worshipped by woman and man.

THE GODDESS

Whereas hunting was the center of religious life for men, food gathering and herbology served the same purpose for women. Such gathering groups must have commonly been loud, noisy and very gay affairs filled with the talk and singing of the women and the sounds of games and yells of the children. Some women were pregnant or probably carried and nursed infants who might be passed from mother to sister, to aunt, and back again. Children and young adolescents would frolic about

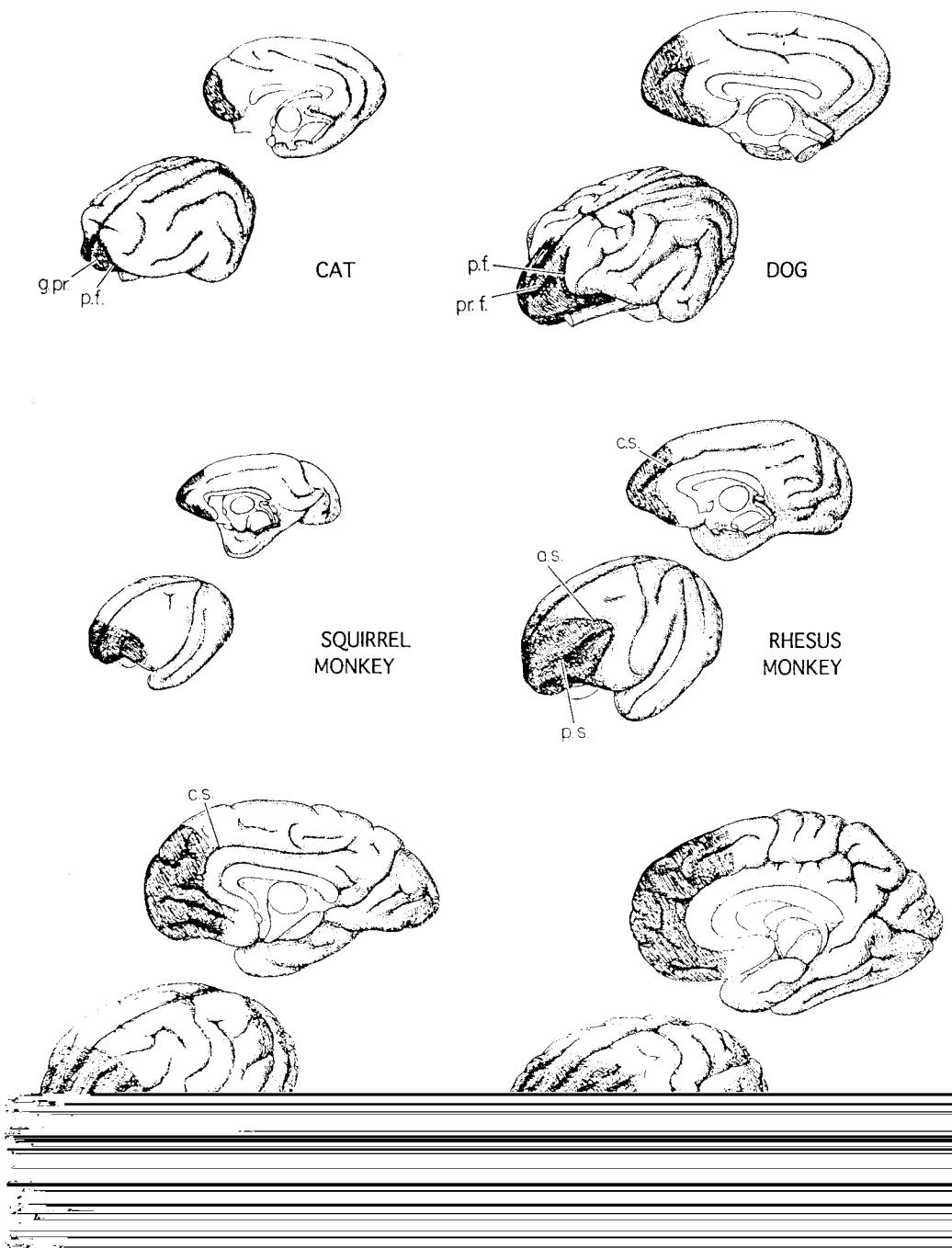


Figure 105. Comparisons of the frontal lobe across species. Note obvious expansion. (Modified from Fuster, 1997. *The Frontal Lobes*. Raven-Lippincott. Baltimore). The frontal lobes subserve inhibitory control, reasoning, judgement, imagination, creativity, and thought, including expressive speech as mediated by the emergence of Broca's expressive speech area in humans.



Figure 92. Comparison of monkey and human frontal lobe. Reprinted from Zigmund et al., 1999 *Fundamental Neuroscience*, Academic Press, San Diego.

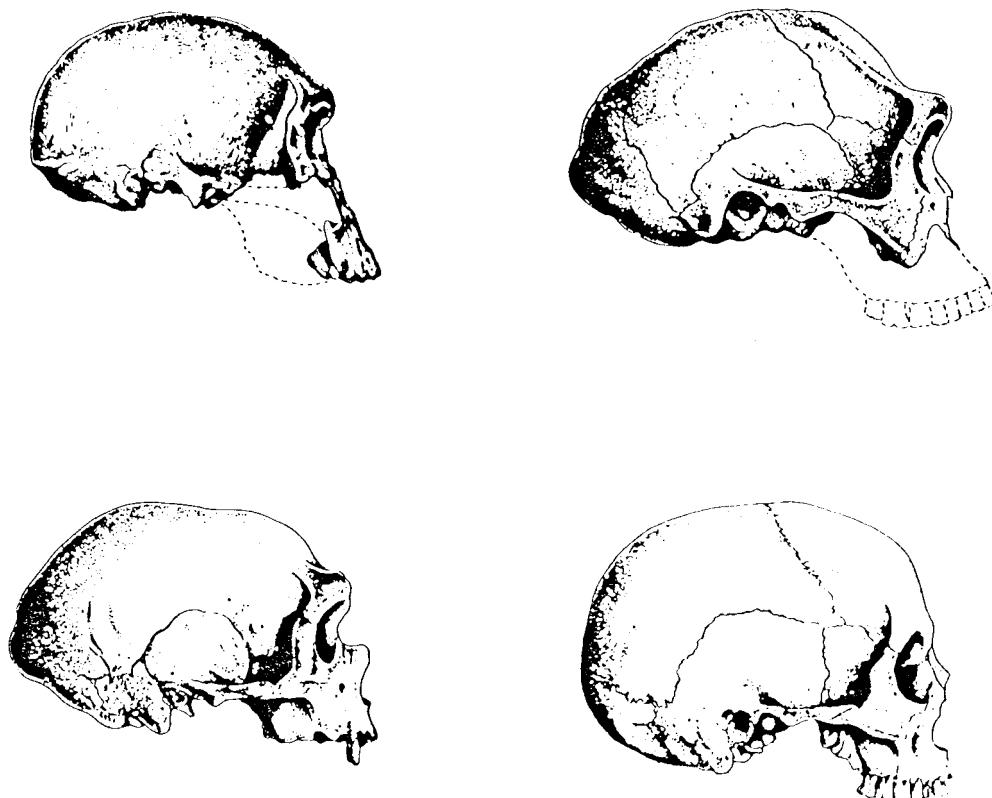


Figure 106. Comparison of the frontal cranium over the course of "evolution:" from *Australopithecus*, to *H. Habilis*, to *H. erectus*, to modern humans. Note obvious expansion of the frontal lobe.



Figure 107. Cro-Magon Art





Figure 108. A mother goddess, holding in her hand the symbol of the moon with 13 lines, which is the number of menstrual/lunar cycles in a solar year. Her other hand rests upon her pregnant belly. This goddess was carved outside the entrance to an underground Paleolithic Cathedral.

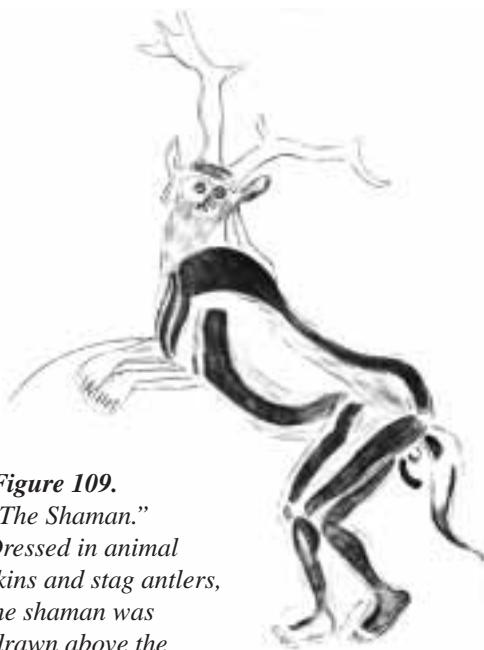


Figure 109.
“*The Shaman.*”
Dressed in animal
skins and stag antlers,
the shaman was
drawn above the
entrance to the grand gallery at *Les Trois-Freres*
Cave in Southern France. Upper Paleolithic. From a
copy made by Abbe Breuil.

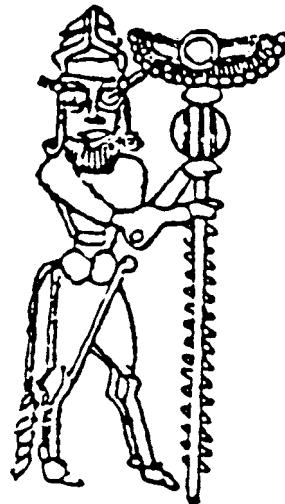


Figure 110. A
Sumerian/Babylonian
god, with shaman’s
horns, holding a staff
upon which sits a
flying solar disc.

and play. The women could talk, sing, celebrate life’s abundance, and share and practice their spiritual faith and worship together as they harvested nature’s bounty.

Woman the gatherer worshipped the Great Mother, the Great Goddess, the Lord of Creation, Mother Earth, the Mother of All. And she carried with her ivory and stone engravings of the Great Mother, and amulets and rings, and mother goddess statues that could be stuck into the ground.

And while the men performed their rituals in the deep recesses of caverns and caves, woman worshipped the Great Mother by dawn’s early light, and the light of the harvest moon. And whereas the men practiced rituals involving death and the spiritual hereafter, women practiced rituals of fertility that celebrated life’s abundance. Dancing, singing, fertility rites, and sex orgies became hallmarks of their rituals.

THE LIFE OF A CRO-MAGNON GODDESS

Whereas the Cro-Magnon hunter invented his own religion and a stockpile of technologically advanced weapons that made him the greatest hunter of all time, woman the gatherer discovered her own unique life giving spirituality and created her own arsenal of tools which made her the greatest artisan of all time. Her creations included statues of female gods, earrings, necklaces, bacelets, pendants, and beads, and complex tools for domestic ease including choppers, scrapers, cleavers with a straight cutting edge on one side (Day, 1996; Righmire, 1990). That these tools were fashioned by a female hand can be deduced by their domestic use (Joseph, 2000a,b). Among hunting and gathering groups it is females and not the males who make and use tools (Niethammer, 1977), the only exception being hunting implements and weapons of war which females are not allowed to touch (Tabet, 1982).

The responsibilities of the Cro-Magnon woman included the preparation of the food she gathered and any meat which the men brought home from their hunting sojourns. In addition to food preparation, clothes were sewn and fashioned out of hides (Clark, 1952, 1967; Prideaux, 1973), and these too are tasks associated with women (Gusinde, 1961; Lee, 1974; Neithammer, 1977), including, presumably, the Cro-Magnon females of the Upper Paleolithic.

Thus the duties of the Upper Paleolithic female were much more multi-faceted and complex than her predecessors, and included cleaning hides via a scraper, drying and curing the skin over the smoke of a fire, and then using a knife or cutter to make the general desired shape. The Upper Paleolithic female was also employing a punch to make holes in these hides, through which leather



Figure 111. A dead hunter and a birds head. A disembowled bison stands above him. Presumably this scene depicts the death of a hunter and the flight of his soul as symbolized by the bird. Bird heads were commonly employed by ancient peoples including the Egyptians to depict the ascension to heaven. Eventually, bird heads were replaced by creatures with wings, e.g. angels. Reproduced with permission, Bildarchiv Preußischer Kulturbesitz.



Figure 112. Goddesses with bird heads. From Libya, approximately 10,000 B.P. The bird head symbolizes the capacity for flight and thus the ability to ascend to heaven.

straps or a vine could be passed so as to create a garment that could keep out the cold (Clark, 1952, 1967; Prideaux, 1973). They were also weaving and using a needle to sew garments together; “domestic” tasks which are almost exclusively associated with “women’s” work (Murdock & Provost, 1973; Neithammer, 1977).

The women were exceedingly skilled artisans whose abilities easily excel those of any modern woman today. And they were creating beautiful, colorful, intricately designed, embroidered, and tailored clothes over 30,000 years ago.

The Cro-Magnon women dressed their men and their children like woodland gods, fed them the food of the gods, picked fresh daily from the Paleolithic garden of Eden. And they worshipped woman as the life creating and life giving goddess, the Great Mother of All who gave life to the earth and woman and man.

VILLAGES BECOME CITIES, BECOME CIVILIZATIONS

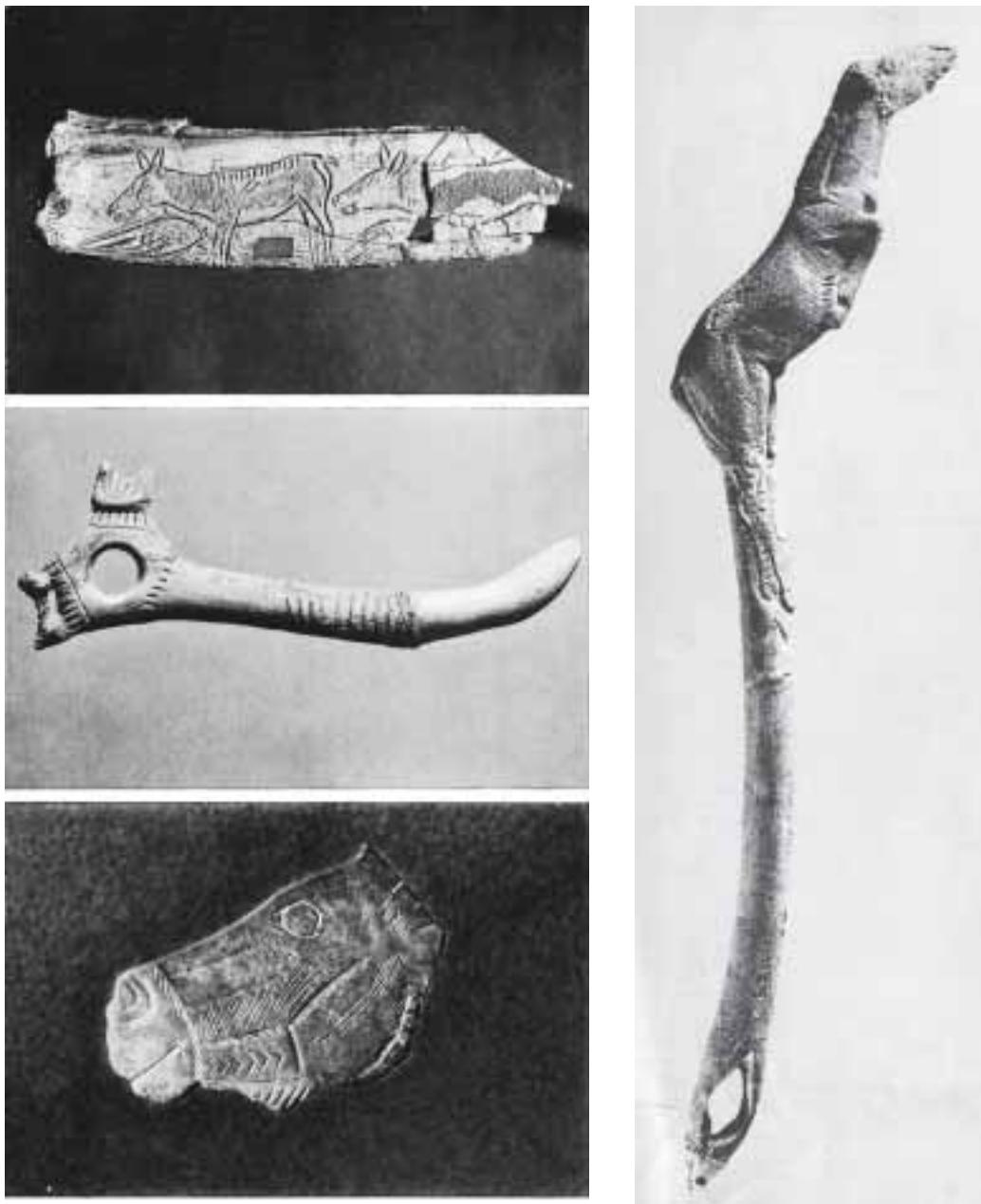


Figure 113. Upper Paleolithic art, including a leaping horse that had been carved as part of a spear thrower.

These people and their descendants became so proficient at art, crafts, horticulture and hunting that they were able to settle year round in villages. In fact, the Cro-Magnon built long houses of wood and stone that were large enough to easily provide shelter for up to 20-25 adults and children at a time. These long houses were about 50 feet long and 20 or more feet wide. These were not merely makeshift accommodations that could be moved at whim. The houses were set on stone foundations that were sunk 2-3 feet into the ground. These houses also contained bedrooms, common living areas (or living rooms), kilns and fireplaces, as well as stone storage vaults where meat and other perishables could be easily stored for weeks at a time.

By contrast, the Neanderthals were still living in cold, damp caves.

“Long houses” are associated with matriarchal, female dominated societies. In these societies daughters and the daughters of daughters never leave home but live with their mothers and grand-



Figure 114. "Venus" figurines. Upper Paleolithic Goddesses.

mothers, thus forming extended families living under one roof, the long house. Men marry into these households, and together these households would make up a village or small town which would be governed by the matriarchs. Therefore it can be deduced that Cro-Magnon society was also matriarchal as is also indicated by the widespread religious cult of the goddess.

By 15,000 years ago, they were already living in great cities of thousands of people; cities surrounded by woodland and small farms and fields of wild wheat. Stone sickles and grinding stones were in use 20,000 years ago which allowed for the harvesting and milling of wild and domestic grains. Moreover, they probably made beer from the grain and may well have discovered that wine could be produced from the fermented grape. Hence, the Cro-Magnon people invented civilization over 20,000 years ago; which is exactly what the oldest written records and the ancient Sumerian, Egyptian and Mayan Kings lists patiently explain.

However, not all Cro-Magnon were city dwellers. Many made their homes out of animal skins that were sewn together thus forming tents. The tents were held together by poles and were anchored to the ground by wooden posts.

The massive efficiency by which these people were able to hunt, gather, forage, as well as plant and harvest their own grains not only resulted in a very well rounded and healthy diet but increased leisure time. Indeed, these people may well have arrived at a 3 day work week 35,000 years ago; leisure time that could be devoted to the development of other pursuits and interests, such as the acquisition of material goods and wealth and the seeking of knowledge and spiritual wisdom; wisdom and knowledge not just of this world, but of the next one.

THE LIMBIC SYSTEM AND SPIRITUAL SYMBOLISM

Middle Paleolithic peoples and those of the Upper Paleolithic buried their dead with grave offerings and with the body placed in sleeping positions. These peoples believed in an afterlife and a spirit world which could be entered through a doorway of dreams. According to the ancients, the soul could exit the body when dreaming and following death.

Because these ancient peoples were capable of experiencing love, fear, and mystical and religious awe, and as they believed in spirits and ghosts, they evolved religious rituals and religious symbolism to help them communicate with and gain control over the spiritual realms. These rites included the development or discovery of signs and symbols which could generate religious awe regardless of time or culture.

For example, in addition to their complex mortuary practices, one of the first signs of exceedingly ancient religious symbolism is an engraved "cross" that is perhaps between 60,000 to 100,000 years old (Mellars, 1989). Likewise, the underground entrance to the Chauvet cathedral, in France, is marked by a large red cross that was painted 35,000 years ago (Chauvet et al., 1996).

Regardless of time and culture, from the Aztecs, Mayans, American Indians, Romans, Greeks, Africans, Christians, Cro-Magnons, Egyptians (the key of life), and so on, the cross consistently appears in a mystical context, and/or is attributed tremendous cosmic or spiritual significance (Budge



Figure 115. Gathering Goddesses.
Large gathering group of women filling their baskets with fruits, grains, and produce from their gardens of Eden. Engraving from the 16th century.

, 1994; Campbell, 1988; Joseph, 2000a; Jung, 1964; Sitchin, 1990).

The “sign of the cross” is found in almost all cultures and generally signifies religious or cosmic significance, e.g. the four seasons, the two equinoxes and two solstices. The sign of the cross was the ideogram of An, the Sumerian giver of all life from which rained down the seeds of life on all worlds including the worlds of the gods. An of the cross gave life to the gods, and to woman and man.

The symbol of the cross is in fact associated with innumerable gods and goddesses, including Anu of the ancient Egyptians (who is identical to An), the Egyptian God Seb, the Goddess Nut, the God Horus (the hawk), as well as Christ and the Mayan and Aztec God, Quetzcoatl. For example, like the Catholics, the Mayas and Aztecs adorned their temples with the sign of the cross. Quetzcoatl, like Jesus, was a god of the cross.

In China the equilateral cross is represented as within a square which represents the Earth, the meaning of which is: “God made the Earth in the form of a cross.” It is noteworthy that the Chinese cross-in-a-box can also be likened to the swastika—also referred to as the “gammadion” which is one of the names of the Lord God: “Tetragammadion”

Swastikas, the crooked cross, also appear across cultures and is associated with the gods, with the heavens, with the creation of the Earth, e.g., the four corners of the Earth, and the four corners of the heavens; and with sexuality, the fertility of the Earth. The swastika is a sex symbol. Four men or women lying together on their sides engaged in mutual masturbation and oral-anal sex.

The commonality in religious significance associated with the cross may have to do with the “four corners” of the world and the heavens; that is, the two equinoxes and the two solstices. As ancient priests and shamans turned their eyes to the heavens, seeking to peer beyond the mystery that separated this world from the next, the “four corners” and the constellation in which the sun rose on the solstice or equinox, may have been a common astronomical method of divining the will of the gods, and for navigation, localization, and calculation. And there may have been stars that were aligned together like today’s southern cross, and these constellations may have also been observed by priests and shamans as they turned their eyes to the heavens, and who viewed these celestial symbols as having heavenly significance.

Yet another factor may be due to the shared commonality of the limbic system, which contains feature detecting neurons sensitive to geometric stimuli including the sign of the cross. The brain structures of the limbic system, e.g., amygdala and hippocampus, and inferior temporal lobe, have been repeatedly implicated in the generation of fear, love, intense emotions, and religious and spiritual beliefs (Bear 1979; Daly 1958; d’Aquili and Newberg 1993; Gloor 1986, 1992; Halgren 1992; Horowitz et al. 1968; Jaynes 1976; Joseph 1992a, 1998a; MacLean 1990; Mesulam 1981; Penfield and Perot 1963; Rolls 1992; Schenk and Bear 1981; Slater and Beard 1963; Subirana and Oller-Daurelia, 1953; Trimble 1991; Weingarten, et al. 1977; Williams 1956).

The amygdala is able to receive, process and integrate multiple signals from all the sensory modalities simultaneously. The amygdala enables us to hear “sweet sounds,” recall “bitter memories,” or determine if something is spiritually significant, sexually enticing, or good to eat (Gloor 1986, 1992, 1997; Halgren 1992; Joseph 1992a, 1996; Kling et al., 1987; O’Keefe and Bouma 1969; Rolls 1992; Ursin and Kaada 1960).

The amygdala enables us to experience the spiritually sublime, is concerned with the most



Figure 116. Paleolithic fertility rites. Dancing Paleolithic Goddess surrounded by female dancers.

basic animal emotions, and allows us to store emotional and personally significant experiences in memory.

The amygdala also makes it possible for us to reexperience these memories when awake or during the course of a dream in the form of visual, auditory, or religious or spiritual imagery (Bear 1979; d'Aquili and Newberg 1993; Gloor 1986, 1992, 1997; Halgren, 1992). It is the amygdala which enables an individual to experience emotions such as love and religious rapture, as well as the ecstasy associated with orgasm, and the dread and terror associated with the unknown. It also appears to generate religious and spiritual significance when presented with the sign of the cross.

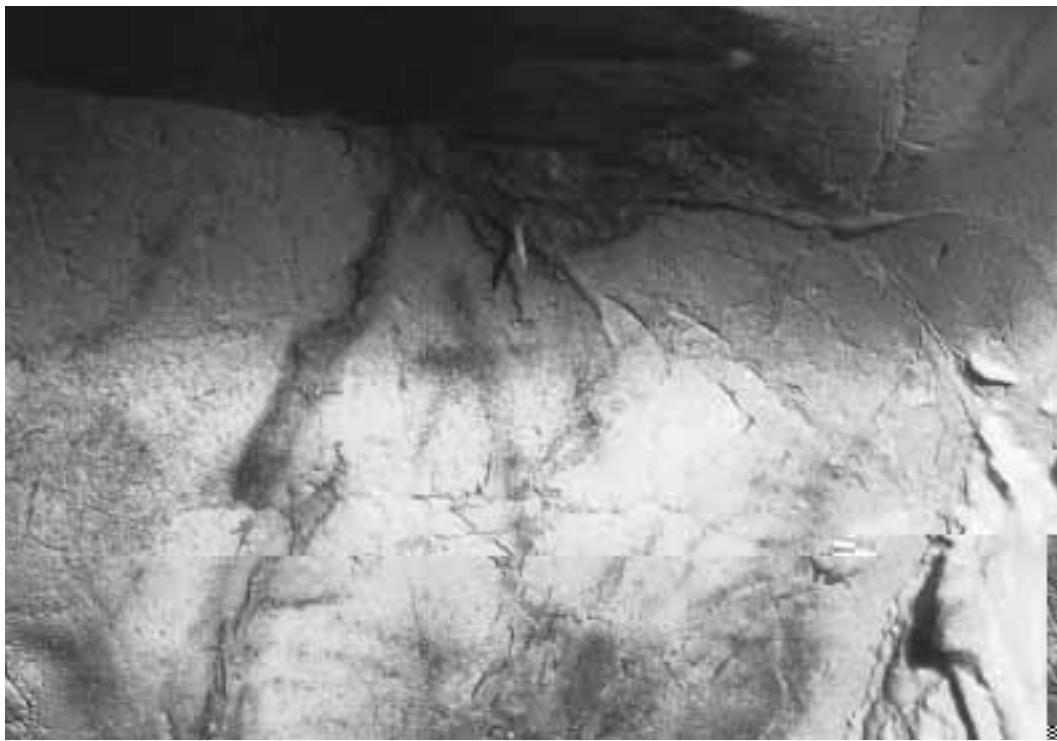


Figure 117. The entrance to the underground Upper Paleolithic cathedral. The Chauvet cave. Note the sign of the cross. Reprinted from Chauvet et al., (1996). *Dawn of Art: The Chauvet Cave*. Henry H. Adams. New York.



Figure 118. The sign of the cross appears across cultures, e.g., the Maya, Aztecs, Chaldeans, Hindus, Persians, Paleolithic American Indians, Chinese. In China the equilateral cross is represented as within a square which represents the Earth, the meaning of which is: "God made the Earth in the form of a cross." It is noteworthy that the Chinese cross-in-a-box can also be likened to the swastika—also referred to as the "gammadion."



Figure 106. The swatiska is a sex symbol and associated with sexuality; i.e., four people laying side by side performing fellatio or cunnilingus upon one another

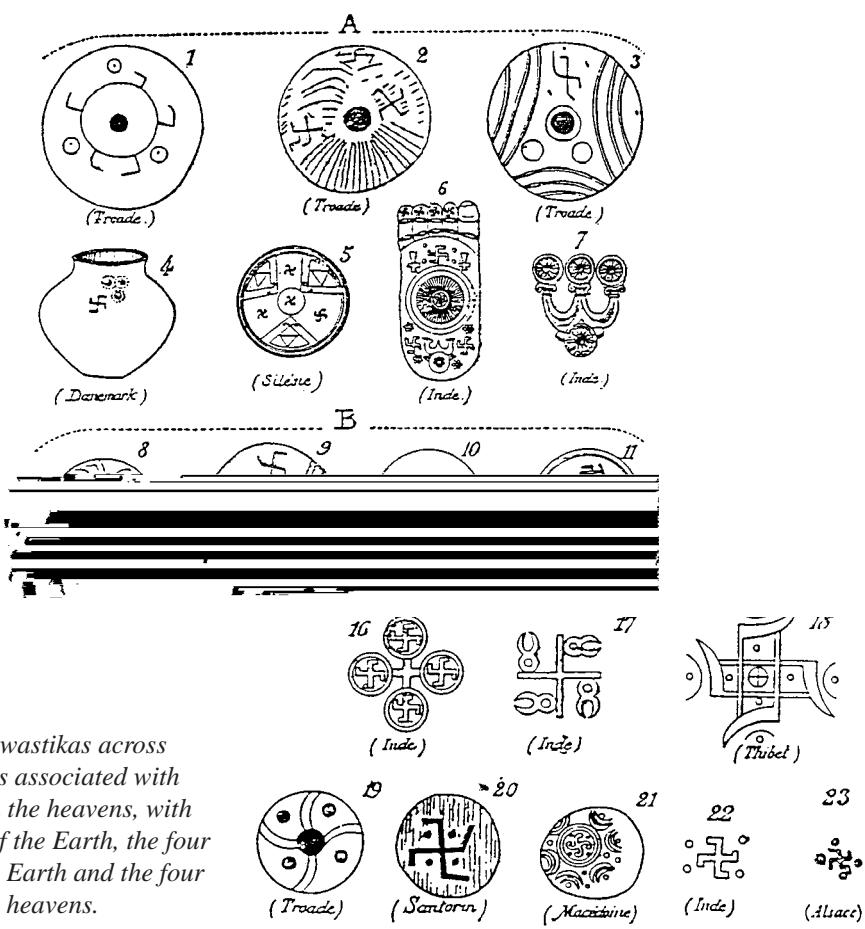


Figure 119. Swastikas across cultures and is associated with the gods, with the heavens, with the creation of the Earth, the four corners of the Earth and the four corners of the heavens.

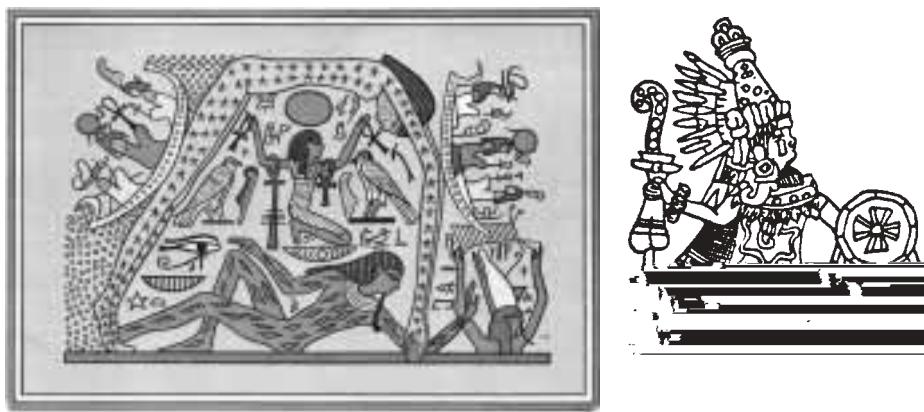
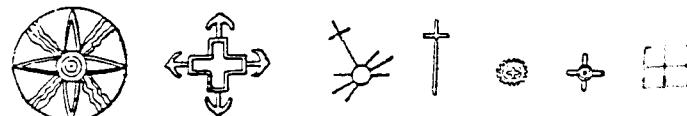
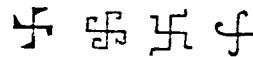


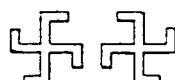
Figure 120. (Top) The God Seb supporting the Goddess Nut who represents heaven. Note the repeated depictions of the key of life; i.e. a ring with a cross at the end. (right) Quetzocoatal. (Below) Examples of cross-cultural crosses.



SOLAR CROSSES.¹



VARIETIES OF THE GAMMADION.



GAMMADIANS.

CROSS-RECOGNITION NEURONS

The inferior temporal lobe, and thus the amygdala and hippocampus, appears to have been well developed in “archaics,” and Neanderthals, comparable, grossly, to the temporal lobes of Upper Paleolithic and present day peoples (Joseph, 1996, 2000a). It is these cerebral structures which have made it possible to experience as well as to attribute spiritual or religious significance to certain actions and geometric signs and stimuli.

Along the neocortical surface of the inferior temporal lobe and the amygdala are dense neuronal fields that contain neurons that fire selectively in response to visual images of faces, hands, eyes, and complex geometric shapes, including crosses (Gross et al. 1972; Hasselmo, Rolls and Baylis, 1989; Morris et al., 1996; Richmond, et al. 1983, 1987; Rolls 1984, 1992). These neurons are sometimes referred to as “feature detectors.” The ability to recognize faces, geometric shapes, and social emotional nuances are dependent on these specialized temporal lobe and amygdala feature-detecting neurons (Gross, et al. 1972; Hasselmo et al. 1989; Morris et al., 1996; Richmond, et al. 1983, 1987; Rolls 1984). Together these structures interact to create complex neural networks that respond selectively to these stimuli, such that, when perceiving a face or a cross the amygdala and temporal lobe become activated.



Figure 121. Aton, the sun God. Note rays of sunlight becoming caressing hands.

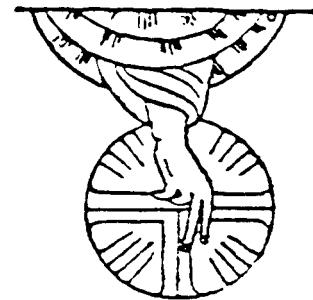
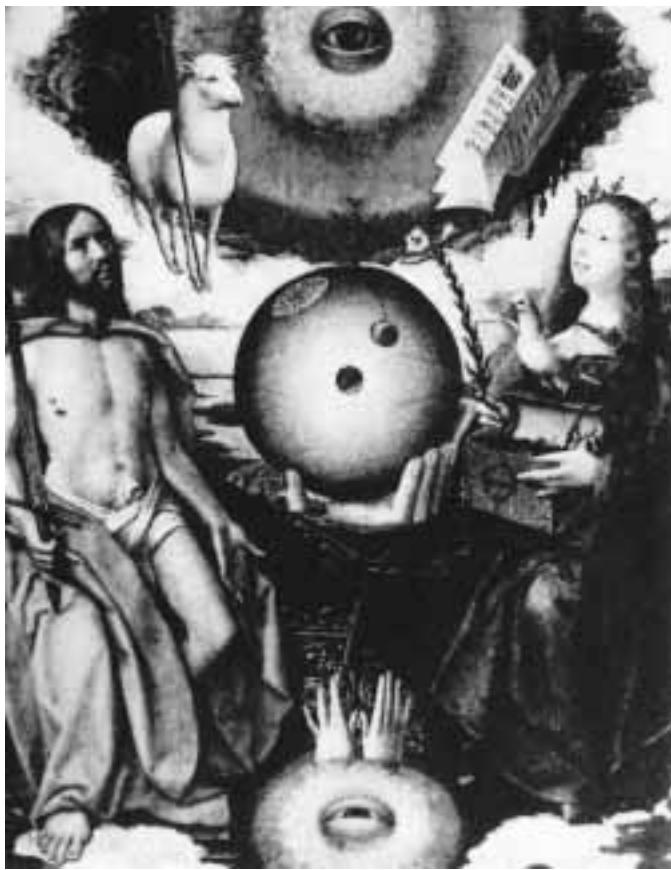


Figure 122. The hand of “god” emerging from a cloud, with the finger tips emitting rays of light, as if the hand were “a living sun.” 9th Century. Paris.

Figure 123. The all-seeing eye of God. Painting by Jan Provost, 15th century.



NeuroTheology

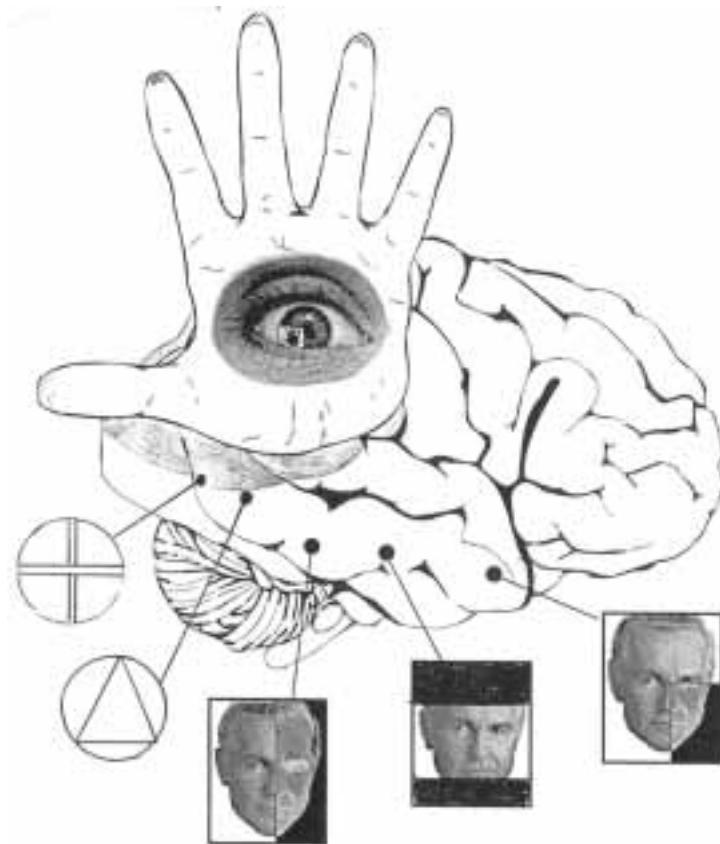
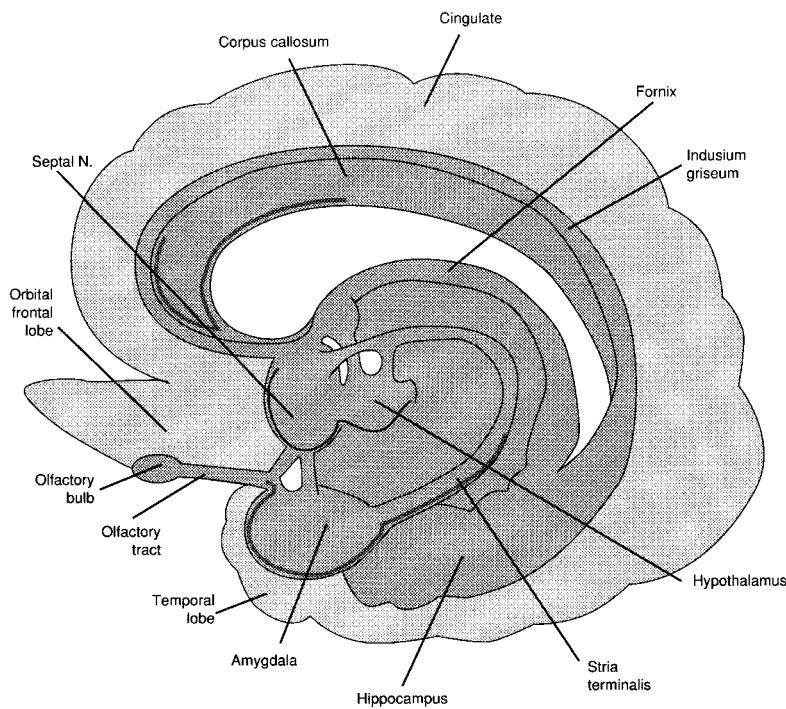


Figure 124. Top: The Limbic System. Above: The parietal lobe has been referred to as a “lobe of the hand.” Neurons within the inferior temporal lobe respond to foveal and the upper visual field, and contain “facial” and “feature” detection neurons.



If the amygdala and overlying temporal lobe were destroyed, the individual would lose the ability to perceive faces or complex geometric stimuli. They would lose the capacity to feel love, or recognize family or friends. Isolation would be preferred. They would also cease to experience emotional or spiritual awe in reaction to religious symbols, such as the sign of the cross.

THE AMYGDALA AND SPIRITUAL SYMBOLISM

Neurons in the amygdala and inferior temporal are multimodally responsive, receiving and integrating signals from all sensory association areas simultaneously (Gloor 1986, 1992, 1997; Halgren 1992; Joseph 1992a, 1996; Kling et al., 1987; O'Keefe and Bouma 1969; Rolls 1992; Ursin and Kaada 1960). Because these structures contain feature detectors and subserve almost all aspects of emotion, including religious feeling, it is possible for faces, hands, eyes, and geometric symbols to become infused with, or to stimulate, mystical and religious feeling, including for example, the “evil eye.” The amygdala located in the right temporal lobe in fact becomes exceedingly excited when it detects that someone is gazing directly at them.

Abnormal activation of the amygdala-temporal lobe is also associated with the experience of frightening hallucinations—due to the activation of these feature-detecting neurons (Gloor, 1997; Joseph, 1992a, Halgren, 1992). The emotion is aroused in response to the hallucination, but is also generated internally even in the absence of a hallucination; fear being the most common reaction associated with amygdala activation (Davis et al., 1997; Gloor, 1997; LeDoux, 1996).

Moreover, as these nuclei respond selectively to stimuli such as crosses or when being stared at, heightened emotional activity within these limbic nuclei could result in feelings of fear, foreboding, or religious awe which is attributed to objects such as “crosses” or the “evil eye.” Crosses, eyes, faces, and related emotions may also be hallucinated if the related feature-detecting neurons are also activated.

Similar explanations could be offered in regard to the spiritual significance attributed to triangles (i.e. pyramids), circles, hands, and eyes. The amygdala and overlying temporal lobe also become activated in response to these perceptual stimuli. In fact, crosses, triangles and circles were etched on Cro-Magnon cave walls over 35,000 years ago (Chauvet et al., 1996), whereas hands, and eyes repeatedly appear in mystical contexts.

However, as to the triangle (which is also the shape of a pyramid), this had long been a sex symbol, and a symbol of fertility, as long ago as the Upper Paleolithic. The triangle is associated with the outer shape of a woman’s vagina—the gateway to the womb, the source of life. And, the amygdala is not only responsive to triangles, but it is one of the primary structures responsible for generating sexual arousal.

Hence, it can be assumed that “cross” and “pyramid” neurons as well as “mystical/religious” feeling neurons (or neural networks) had probably evolved by 35,000 and perhaps 100,000 years ago—possibly in reaction to repeated exposure to a woman’s naked body, and the experience of “cross-like” stimuli in nature. One need only rise their arms horizontally or walk in the forest to spy dead trees that take the form of a “cross,” or look upward to view birds with extended cross-like wings soaring through the skies. The sign of the cross is not uncommon and when staring at a cross the temporal lobes and the amygdala are activated.

Likewise, a woman with her legs spread, or in the act of giving birth, would have also generated extremely intense emotions, ranging from sexual arousal in reaction to her triangular-shaped vagina, to the dread and fear associated with the life creating potential of the womb and the great unknown.

THE FRONTAL LOBES & SPIRITUAL SYMBOLISM

The evolution and expansion of the frontal lobe and the inferior parietal lobe, have significantly contributed to the evolution of language, tool technology, and artistic symbolism (Joseph 1993, 1999e). Over the course of mammalian, primate and human evolution, the frontal lobes have significantly expanded in size and complexity, reaching their greatest degree of development in humans (Fuster, 1997). Likewise, with the evolution of modern humans, a wholly unique structure also evolved: the angular gyrus of the inferior parietal lobe (Joseph, 1999e).

As is well known, the frontal lobes serve as the “senior executive” of the brain, cognition, and personality, regulating information processing throughout the cerebrum (Fuster 1997; Joseph 1986a, 1999a; Passingham 1993; Selemon et al. 1995; Shallice & Burgess 1991; Stuss & Benson 1986), including, via Broca’s area, the expression of symbolic speech. The frontal lobes are primary in



Figure 125. The pyramid/triangle often appears in a mystical context and is associated with the life giving attributes of the Great Goddess, the Mother of All. Specifically, the pyramid/triangle is associated with a woman's vagina, the source of new life.



regard to all aspects of imagination, creativity, and symbolic thinking. Hence, the evolution and expansion of the anterior portion of the brain confer greater creative, cognitive, linguistic and intellectual capabilities upon those so endowed.

Likewise, the angular gyrus of the inferior parietal lobe (IPL) plays an important role in language, symbolic thinking, as well as artistry, drawing, creativity, tool use and manipulation (Joseph 1982, 1993, 1999e; Kimura 1993; Strub & Geschwind 1983). The IPL/angular gyrus sits at the junction of the tactile, visual, and auditory association areas, and assimilates, sequentially organizes, and injects this material into the stream of language and thought.

Hominoids (and other non-human mammals) lack an angular gyrus (Geschwind 1965) and their artistic talents, symbolic abilities, and tool-making capabilities are limited to hammering with rocks, and throwing or manipulating leaves, sticks, and twigs (Boesch & Tomasello 1998; Fedigan 1992; Goodall 1986, 1990; McGrew & Marchant 1992).

The tool making tradition of *H. habilis* was exceedingly primitive, consisting of rocks that had been banged together in order to arrive at a desired shape. Hence, it can be concluded that *H. habilis* had not yet evolved an angular gyrus and that the frontal lobe had no expanded beyond that of other primates such as chimpanzees. It can be also be concluded (see below) that *H. habilis* had not yet evolved the ability to speak in a manner even remotely resembling the speech of modern humans—an impression that is also bolstered by their poorly developed (pre-) frontal lobe, a region that contains Broca's expressive speech area.

THE NEANDERTHAL VS CRO-MAGON FRONTAL LOBE

The human frontal lobes serve as the "Senior Executive" of the brain and personality (Fuster 1997; Joseph 1986a, 1999a; Passingham 1993; Selemon, Goldman-Rakic & Tamminga 1995; Shallice & Burgess 1991; Stuss & Benson 1986), and are "interlocked" via converging and reciprocal connections with the limbic system, striatum, thalamus, and the primary, secondary, and multi-modality associational areas including Wernicke's area and the IPL (Fuster 1997; Jones & Powell 1970; Goldman-Rakic 1995, 1996; Pandya 1988; Pandya & Yeterian 1990; Petrides & Pandya 1988). Through these interactional pathways, the frontal lobes are able to coordinate and regulate attention, memory, personality, and information processing throughout the neocortex so as to direct intellectual, creative, artistic, symbolic, and cognitive processes (Fuster 1997; Goldman-Rakic 1995, 1996; Joseph 1986a, 1999a; Luria 1980; Passingham 1993; Shallice & Burgess 1991; Stuss & Benson 1986).

As based on human (and animal) experimental and case studies, it is well established that the frontal lobes enable humans to think symbolically, creatively, imaginatively, and to plan for the future and to consider the consequences of certain acts, to formulate secondary goals, and to keep one goal in mind even while engaging in other tasks, so that one may remember and act on those goals at a later time (Fuster 1997; Goldman-Rakic 1995, 1996; Joseph 1986a, 1999a; Luria 1980; Shallice & Burgess 1991; Stuss & Benson 1986). Selective attention, planning skills, and the ability to marshal one's intellectual resources so as to not only remember but achieve those goals, and the capacity to anticipate the future rather than living in the past, are capacities clearly associated with the frontal lobes (Fuster 1997; Joseph 1986a, 1999a; Stuss & Benson 1986).

In addition, the right and left frontal lobes respectively subserve the expression of emotional-melodic, and vocabulary-rich grammatical speech (Gorelick & Ross 1987; Joseph 1982, 1986a, 1988a, 1999a,e; Ross 1993). Specifically, upon receiving converging impulses from the IPL and the language and auditory areas in the temporal lobes, Broca's area (and its emotional speech producing counterpart in the right frontal lobe) act on the immediately adjacent secondary and primary motor areas which control, regulate and program the oral laryngeal musculature (Foerster 1936; Fox 1995; Joseph 1982, 1988a, 1999e,f). Therefore, the ability to express one's thoughts, ideas, and emotions through complex speech is made possible by the frontal lobes.

Although endocasts should not be employed to localize functional landmarks such as Broca's area, they are useful for making gross determinations as to the overall size and configuration of the cerebrum and the lobes of the brain. In this regard, and as based on cranial comparisons, or endocasts using the temporal and frontal poles as reference points, it has been demonstrated that the brain has tripled in size, and that the frontal lobes have significantly expanded in length and height over the course of human evolution and during the Middle to Upper Paleolithic transition (Blinkov and Glezer 1968; Joseph 1993; MacLean 1990; Tilney 1928; Weil 1929; Wolpoff 1980). Cro-Magon people were obviously superiorly endowed as compared to Neanderthals.

For example, it is apparent (see figures), that the height of the frontal portion of the skull is



Figure 126. A modern (dotted line) mesolithic cranium compared with a more ancient cranium (solid line). Arrows indicate the main average changes in skull structure including a reduction in the length of the occiput and an increase and upward expansion in the frontal cranial vault. Reproduced from M. H. Wolpoff (1980), *Paleo-Anthropology*. New York, Knopf.

greater in the six foot tall, anatomically modern Upper Paleolithic *H. sapiens sapiens* (Cro-Magnon) versus Neanderthal/archaic *H. sapiens* (see also Wolpoff 1980, Table 12.1; and Tilney, 1928). Hence, impoverished Neanderthal frontal lobe development and expanded Cro-Magnon frontal lobe capacity is indicated. Indeed, the characteristic “sloping forehead” was an obvious limiting factor in archaic and Neanderthal frontal lobe development. The Cro-Magnon brain was significantly larger than the Neanderthal brain, with volumes ranging from around 1600 to 1880 cc on average compared with 1,033 to 1,681 cc for Neanderthals (Blinikov & Glezer 1968; Clark 1967; Day 1986; Holloway 1985b; Roginskii & Lewin 1955; Wolpoff 1980).

The differential evolution of the Cro-Magnon vs the Neanderthal frontal lobe (and angular gyrus) is also apparent as based on paleo-neurological and neuropsychological analysis of tool and hunting technology, artistic and symbolic development, and social organization in the Upper vs the Middle Paleolithic (Joseph 1993). As will be detailed below, the angular gyrus probably emerged and Broca's area probably became fully functional during the Middle to Upper Paleolithic transition; evolutionary developments which likely contributed to the demise of the Neanderthals.

Since Cro-Magnon's shared the planet with Neanderthals during overlapping time periods (and coupled with evidence reviewed below) it certainly seems reasonable to assume that the expansion and evolution of the frontal lobe and angular gyrus, provided these people with an obvious competitive advantage as they clearly dwarfed the Neanderthals in all aspects of cultural, intellectual, social, linguistic and technological achievement. Hence, endowed with a bigger brain and expanded frontal and IPL/angular gyral capacity, the cognitively, linguistically, technologically and intellectually superior “Cro-Magnons” and other “modern” Upper Paleolithians, probably engaged in wide spread ethnic cleansing and exterminated the rather short (5ft 4in.), sloped-headed, heavily muscled Neanderthals, eradicating all but hybrids from the face of the Earth, some 35,000 to 28,000 years ago.

By contrast, whereas the Neanderthals frontal lobe is not as well developed, the occipital and superior parietal areas are larger in length and breadth (Wolpoff, 1980). However, these posterior regions of the brain are concerned with visual analysis and positioning the body in space (see chapters 20, 22). As male and female Neanderthals spent a considerable amount of their time engaged in hunting activities (see below), scanning the environment for prey and running and throwing in visual space were more or less ongoing concerns. A large occipital and superior parietal lobe would reflect these activities.

Because the modern frontal lobe is so extensive and highly developed, and as different frontal regions have evolved at different times periods and are organized differently and have different neuroanatomical connections, they are concerned with different functions (chapter 19; see also Fuster 1997; Joseph, 1999a). For example, about one third of the frontal lobe, i.e. the motor areas, are concerned with initiating, planning, and controlling the movement of the body and fine motor functioning. It is this part of the “archaic” and Neanderthal frontal lobe that appears to be most exten-

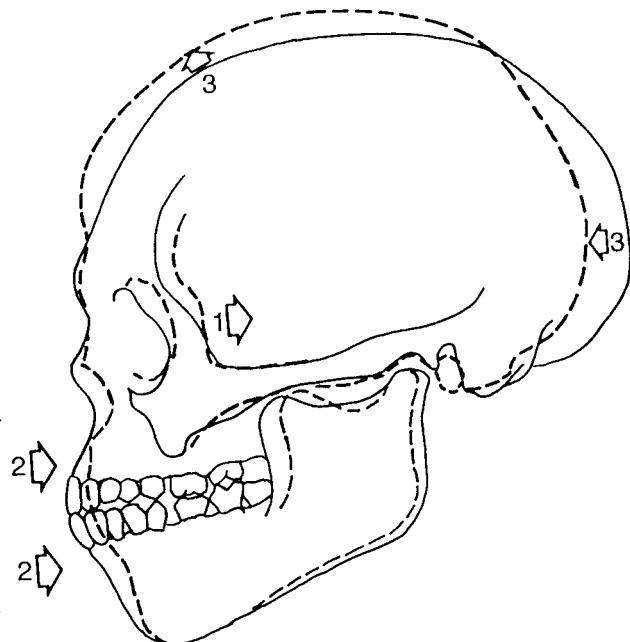




Figure 127. Neanderthal (top) and Cro Magnon (bottom) craniums. Note expanded frontal region of skull in Cro-Magnon.

sively developed.

The “orbital frontal lobes” acts to inhibit and control motivational and emotional impulses arising from within the limbic system (chapter 19). Via orbital frontal interconnections with the limbic system it is possible for emotions to be represented as ideas, and for ideas to trigger emotions. An examination of the “archaic” *H. sapien* and Neanderthal orbital area (i.e. endocasts) suggests a relative paucity of development.

The more recently evolved anterior (pre-) frontal lobe and the lateral frontal convexity are highly important in imaginative and creative thinking and regulating the transfer of information to the neocortex. These structures are involved in perceptual filtering, and exerting steering influences on the neocortex so as to direct attention and intellectual processes (Como, Joseph, Forrest, Fiducia, Siegel, 1979; Heilman & Van Den Abel, 1980; Joseph, et al. 1981; Joseph, 1986a, 1999a). That is, the anterior half of the frontal lobes act to mediate and coordinate information processing throughout the brain by continually sampling, monitoring, inhibiting and thus controlling and regulating perceptual, cognitive, and neocortical activity. And, in receiving this information, the frontal lobes play a significant role in all aspects of symbolic and imaginative thinking, including those thoughts pertaining to the symbolism and meaning of the spiritually sublime and religious experience.

Moreover, social skills, planning skills, the formation of long range goals, the ability to marshal one’s resources so as to achieve those goals, and the capacity to consider and anticipate the future, rather than living in the past, as well as develop alternative problem solving strategies and consider a multiple range of ideas simultaneously, are capacities clearly associated with frontal lobe functional integrity. Hence, an individual is able to not only anticipate the future and the consequences of certain acts, but can formulate and plan secondary goals which depend on the completion of one’s initially planned actions. Indeed, the capacity to decide to do something later, to remember and do it later, and to dream and fantasize and to visualize the future as pure possibility are made possible via the frontal lobes. It is the evolution of the anterior regions of the frontal lobe which have made abstract thinking and abstract reasoning possible, and to express these thoughts symbolically via language or artistic symbolism.

Conversely, when the frontal lobes have been damaged, or when the “prefrontal” lobes have

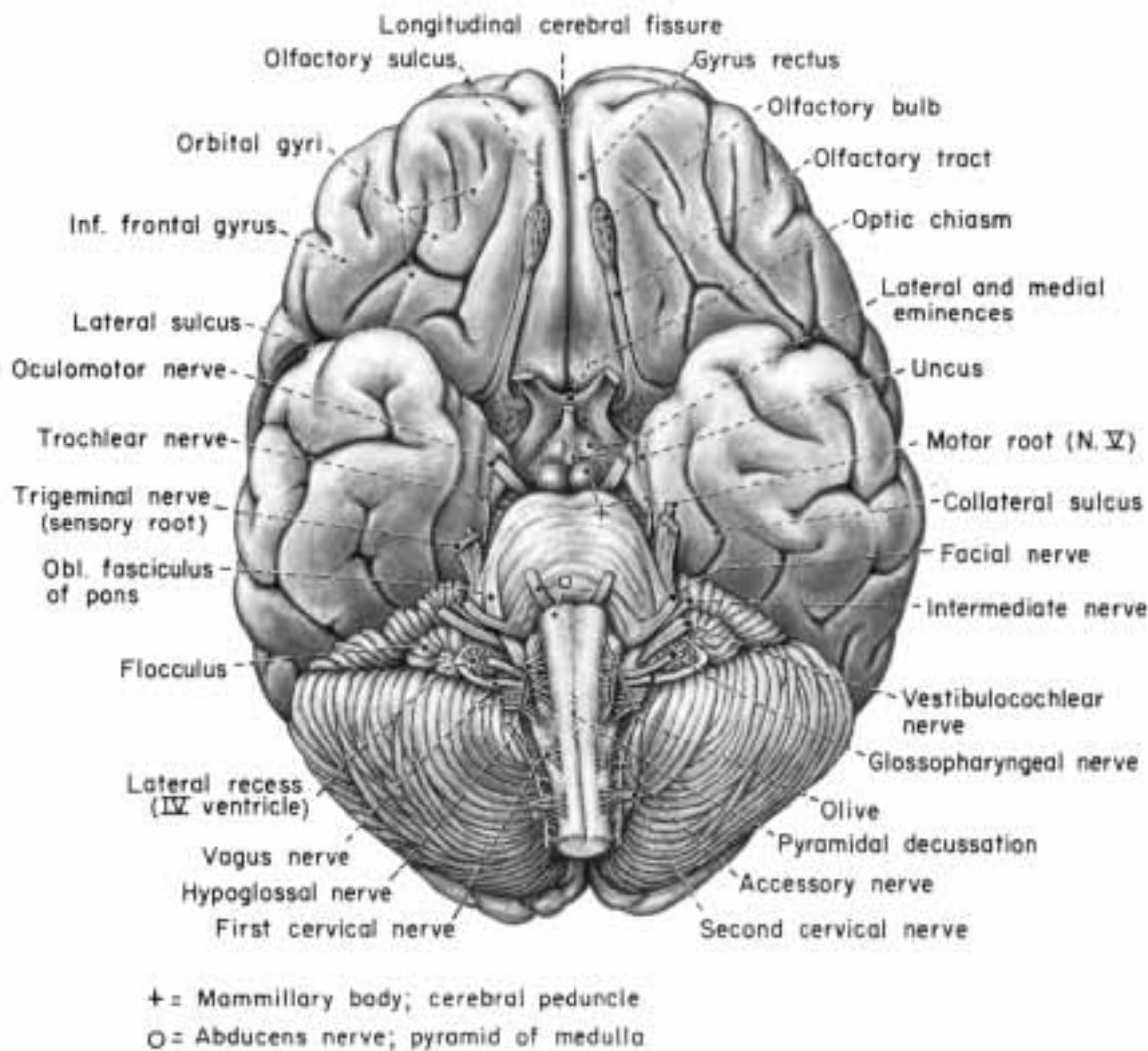


Figure 128. Ventral surface of the brain, depicting the orbital frontal lobes. From M. Carpenter, 1991. Core Text of Neuroanatomy, Williams & Wilkins.

been disconnected from the rest of the brain (such as following pre-frontal lobotomy), status seeking, social concern, foresight, and emotional, motivational, intellectual, conceptual, initiative, problem solving and organization skills are negatively impacted (Fuster 1997; Joseph, 1986a, 1999a; Luria, 1980; Passingham 1993). Frontal lobe damage or surgical disconnection of the pre-frontal lobe reduces one's ability to profit from experience, to anticipate consequences, or to learn from errors by modifying future behavior. There is a reduction in creativity, dreaming, abstract reasoning, symbolic

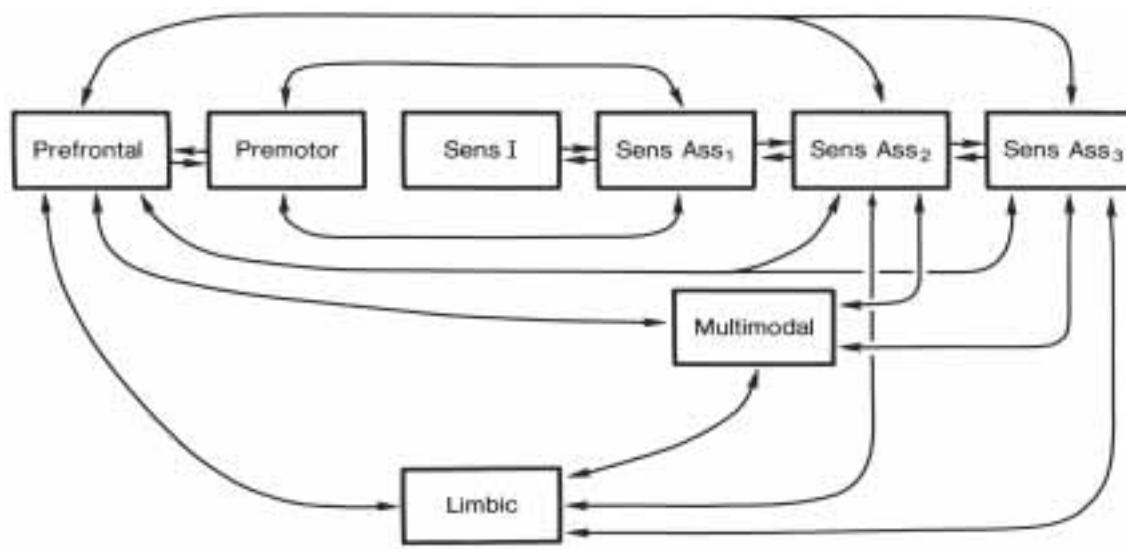


Figure 129. Schematic diagram of the organization of the sensory areas and their connections to the frontal lobe. From Gloor, 1997, *The Temporal Lobe and Limbic System*. Oxford University Press.

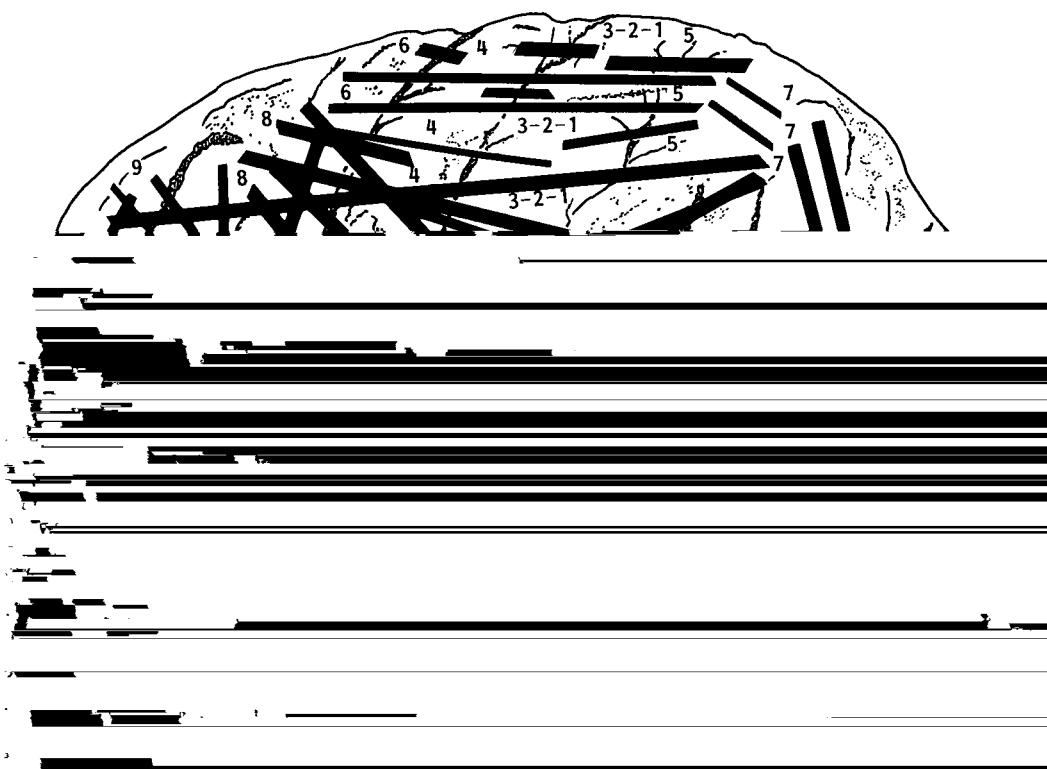


Figure 130. Schematic diagram of the organization of the frontal receiving areas. From Joseph, 1990.

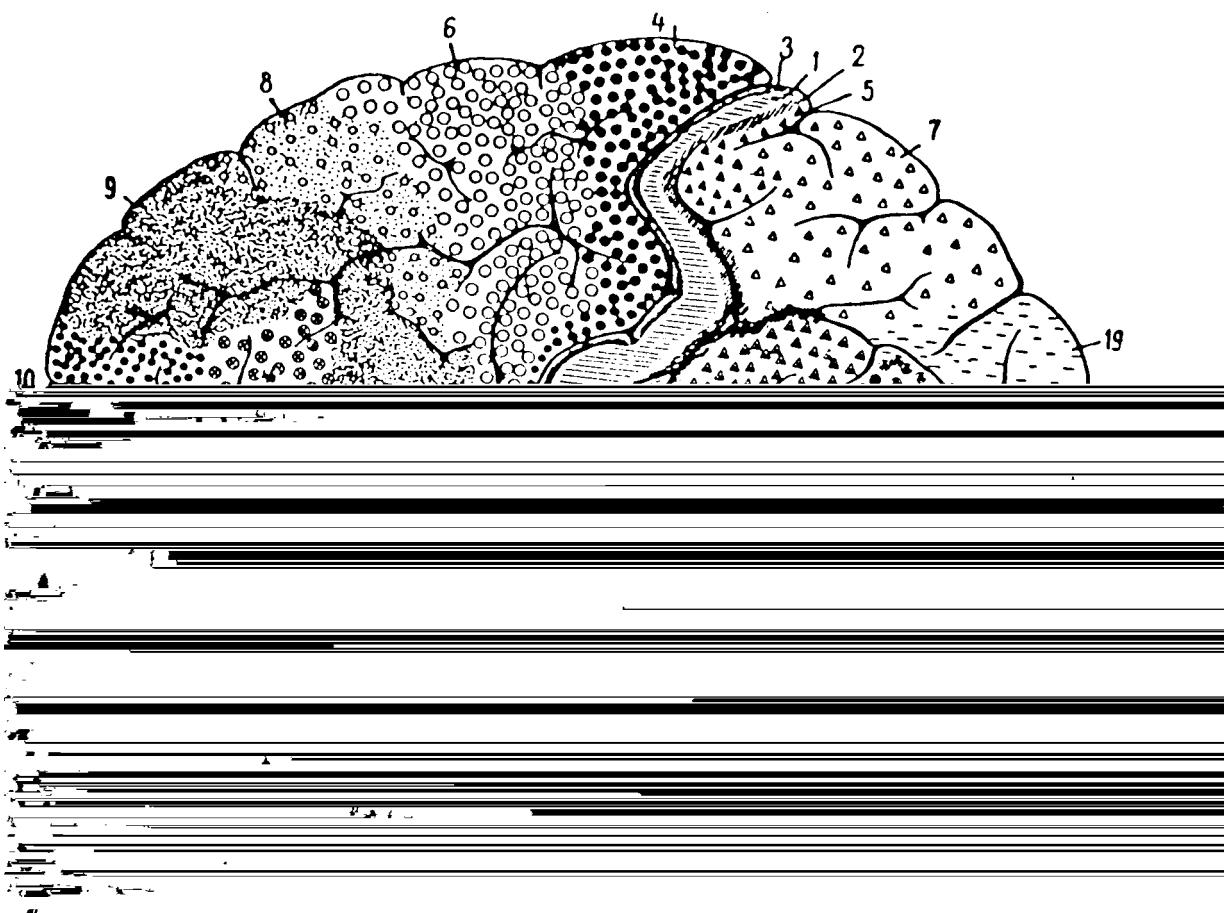


Figure 131. The left hemisphere. The frontal lobe includes Brodmann's areas: 4,6,8,9,10,11,12,44,45,46, etc.,

vs Neanderthal skull, but in the paucity of Neanderthal symbolism or artistry, that the Cro-Magnon was blessed with a larger frontal lobe. Hence, although both groups display evidence of spirituality and belief in life after death, the Cro-Magon were able to symbolize their thoughts through religious artistry.

THE RIGHT HEMISPHERE

It has now been clearly demonstrated that the right cerebral hemisphere is dominant over the left in the analysis of geometric and visual-space, the perception of depth, distance, direction, shape, orientation, position, perspective, and figure-ground, the detection of complex and hidden figures, the performance of visual closure, gestalt formation, and the ability to infer the total stimulus configuration from incomplete information, route finding and maze learning, localizing targets in space, drawing and copying complex geometric-like figures and performing constructional tasks, block designs and puzzles (Benton 1993; Butters & Barton, 1970; Carmon & Bechtoldt, 1969; DeRenzi & Scotti, 1969; DeRenzi et al. 1969; Ettlinger, 1960; Fontenot, 1973; Franco & Sperry, 1977; Fried et al. 1982; Hannay et al., 1987; Kimura, 1966; 1969, 1993; Landis et al. 1986; Lansdell, 1968, 1970; Levy, 1974; Milner, 1968; Nebes, 1971; Sperry, 1982). It is for these and other reasons that the right brain is often viewed as the artistic half of the cerebrum.

Hence, if the right hemisphere is injured, the ability to draw and to perform visual-spatial and artistic tasks, is completely disrupted. Even when required to copy simple figures and drawings, patients with right cerebral injuries have trouble with general shape and organization, and their drawings and copies are grossly distorted and/or characterized by left sided neglect.

However, although the right frontal lobes play a significant role in symbolic thinking, fantasy,

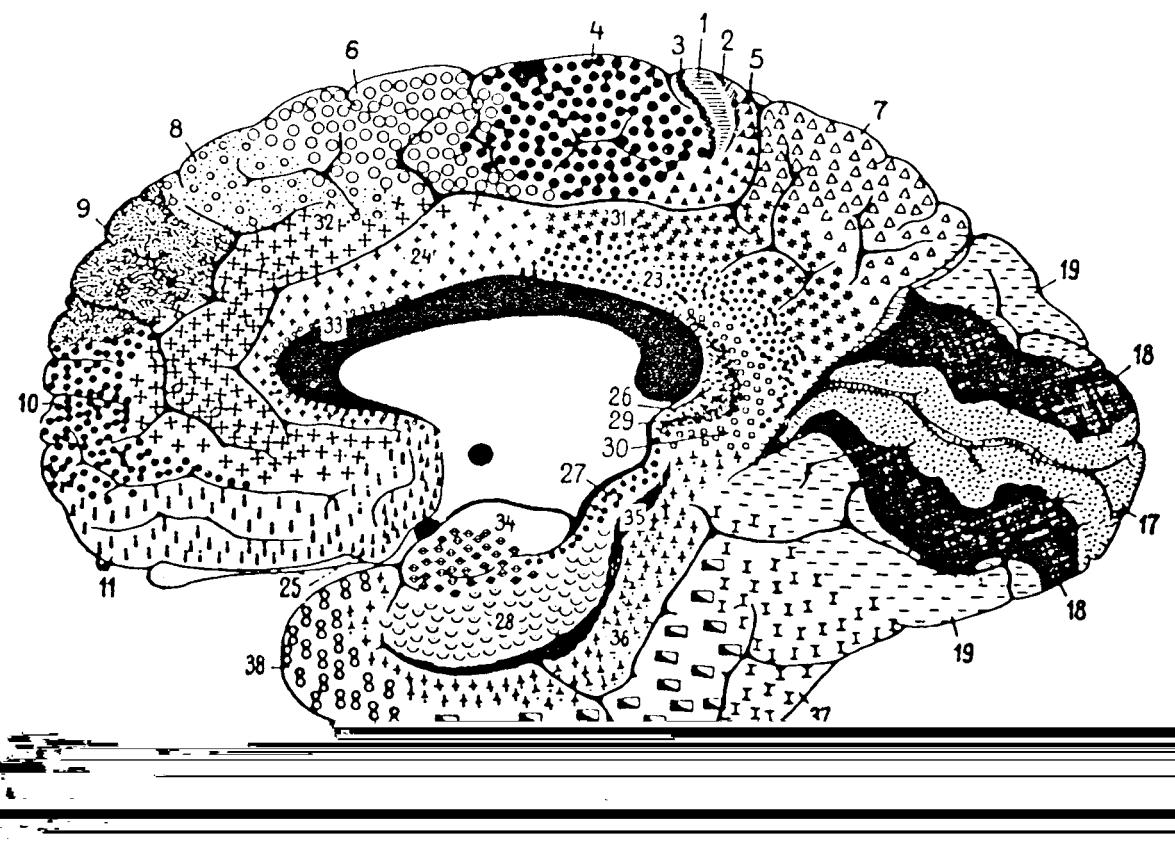


Figure 132. A medial view of the right hemisphere. The frontal lobe includes Brodmann's areas: 4, 6, 8, 9, 10, 11, 12, etc.,

and artistry, it is the right inferior parietal lobe (IPL) and the angular gyrus of the IPL, which has shown to be crucially important in performing artistic tasks. Hence, if the right IPL is injured, the patient may demonstrate what is called "Constructional Apraxia."

Likewise, injury to the left IPL (and angular gyrus) can create apraxic disturbances. However, in these cases, it is the ability to use tools and not visual-spatial or artistic functioning per se, which is effected. On the otherhand, since both the right and left IPL are intimately interconnected with the frontal lobes, and the speech areas, damage to the left IPL can also disrupt speech and language.

THE INFERIOR PARIETAL LOBE

The angular gyrus of the inferior parietal lobule (IPL) is unique to humans (Geschwind, 1965), and is crucially evolved in artistic and constructional tasks, and in controlling temporal sequential hand movements including the manipulation of external objects and internal impressions (De Renzi and Lucchetti, 1988; Heilman et al., 1982; Kimura, 1993; Strub and Geschwind, 1983). As first detailed by Joseph (1982, 2000) the evolution of the angular gyrus enabled humans to engage in complex creative, symbolic, and artistic activities involving a series of related steps, to create and utilize tools, to produce and comprehend complex gestures, such as American Sign Language, and to express and perceive grammatical relationships—capacities which are disrupted with lesions localized to the IPL. In fact, the motor engrams that make possible artistic, constructional and temporal and sequential motor acts, including those involved in grammatical verbal expression, are partly localized within the IPL (De Renzi and Lucchetti, 1988; Heilman et al., 1982; Kimura, 1993; Strub and Geschwind, 1983). In fact, the IPL not only interacts with but appears to program the frontal motor areas for the purposes of producing fine motor, temporal-sequential and artistic movements, including the vocalization of speech units.

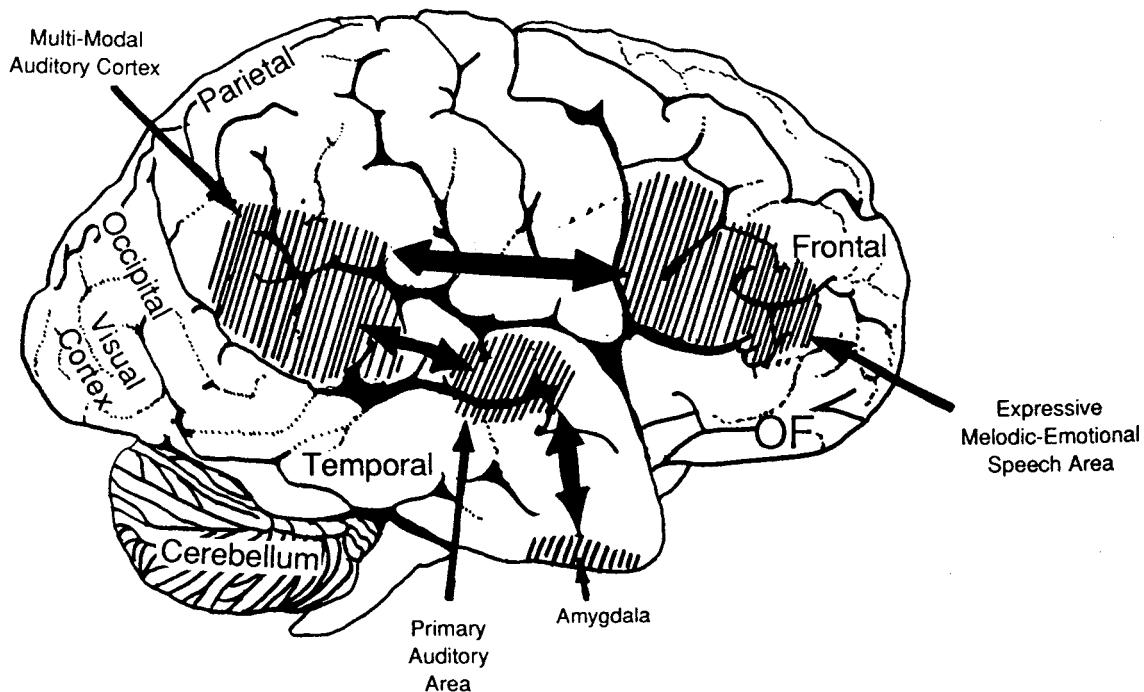


Figure 133. The melodic speech areas of the right hemisphere. From Joseph, 1988a.

Those devoid of an angular gyrus/IPL, or those who have suffered a severe injury to this area, are generally unable to draw complex objects or to correctly manipulate or fashion complex tools - much less utilize them in a complex temporal sequence. This condition is referred to as apraxia; i.e. an inability to perform tasks involving interrelated steps and sequences (De Renzi and Lucchetti, 1988; Geschwind, 1965; Heilman et al., 1982; Kimura, 1993). With severe left-sided IPL injuries, the individual may be unable to make a cup of coffee or put on their clothes, much less fashion or sew them together. Moreover, grammatical speech is disrupted and patients may suffer extreme word finding difficulty, or a conduction aphasia. That is, speech is no longer produced as Broca's area is disconnected from the IPL and Wernicke's area. Likewise, reading ability is disrupted as the left IPL not only comprehends and produces gestures but visual symbols including written language. By contrast, injuries to the right IPL completely disrupts the ability to draw simple and complex objects or to perform visual-spatial and artistic tasks.

Hence, the IPL/angular gyrus (including the frontal motor areas) makes possible the ability to fashion and manipulate tools and organizes speech into vocabulary-rich, temporal sequential grammatical units, as well as to draw, create symbols, or to engage in artistic tasks.

As apes do not possess an angular gyrus (Geschwind, 1965), it appears that over the course of evolution, with the development of right handedness and selective pressures acting on gene selection across gathering/tool-making generations, the IPL/angular gyrus emerged as an extension of the auditory area in the temporal lobe and the superior parietal visual-hand area. Indeed, the parietal lobes are considered a "lobe of the hand" and contain neurons which guide hand movements (Hyvarinen, 1982; Kaas, 1993; Lynch, 1980; Mountcastle et al., 1975, 1980) and which respond to visual input from the periphery and lower visual fields -the regions in which tool-making and tool-using hands are most likely to come into view.

Because most individuals would use the right hand for drawing or tool making and the left for holding the tool, it is the left parietal lobe (which monitors the right lower visual field and controls the right hand) that guides and visually observes, learns and memorizes hand-movements when gathering, gesturing, or manipulating some object or constructing a tool. By contrast, it is the right IPL and angular gyrus which is performing the visual-spatial analysis and which is guiding the left and right frontal motor areas, when using tools in order to create signs, symbols, and works of art.

Over the course of evolution and as experience and the environment act on gene selection and

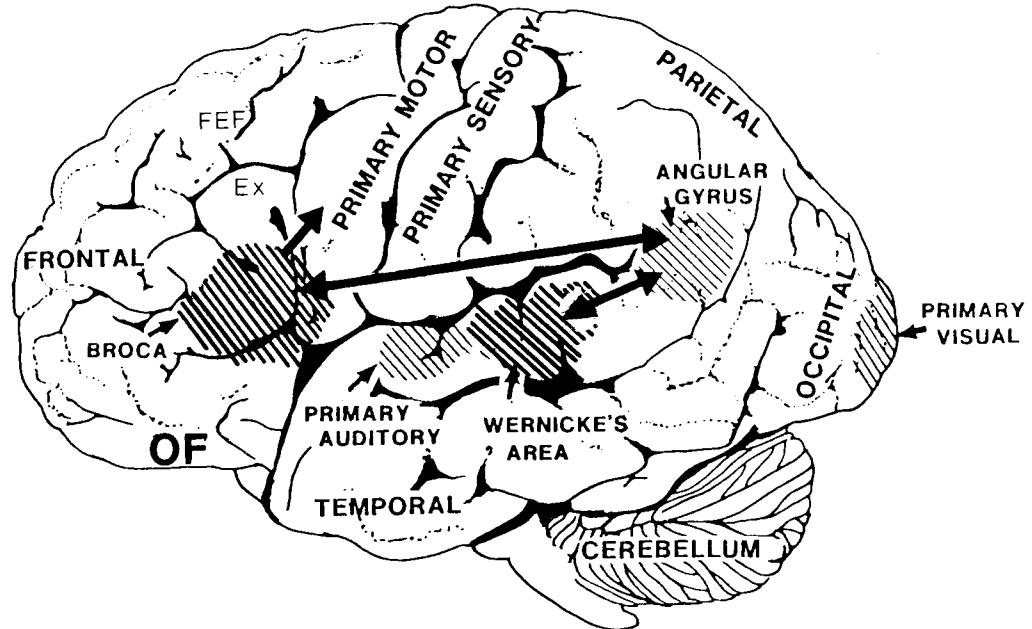
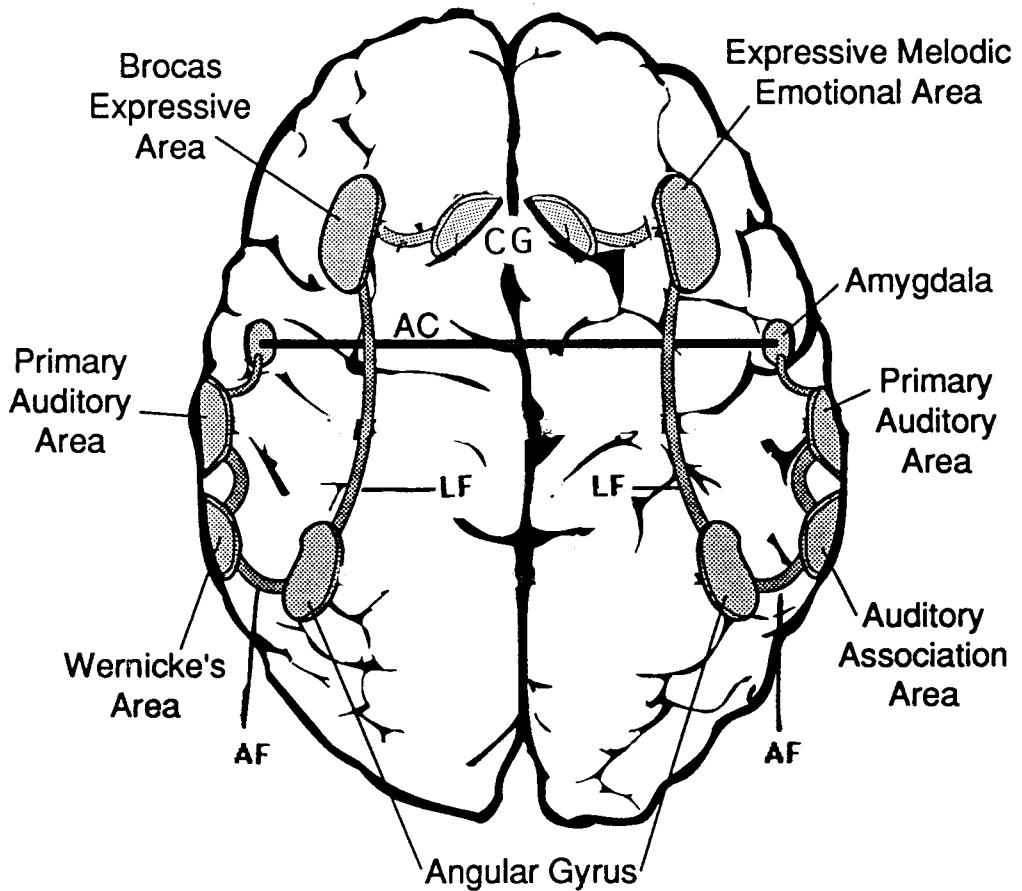
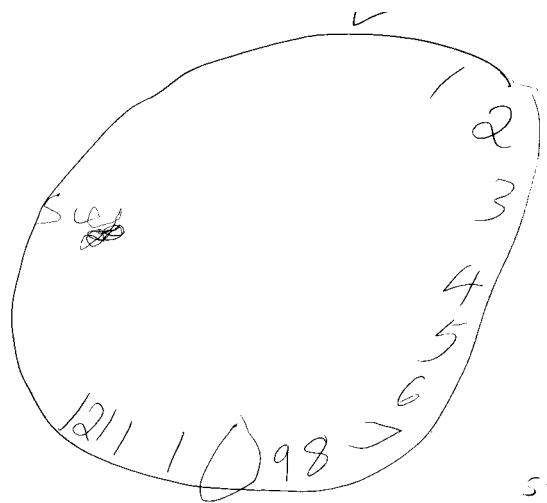


Figure 134. (Top) Superior view of the right and left hemisphere. From Joseph, 1996. (Bottom) The "Language Axis" of the left hemisphere. From Joseph, 1982.



Figure 135. Drawing of a clock by a patient with right parietal injury, from Joseph, 1988a.



induce neural plasticity, the parietal (and superior temporal) lobe expanded, the angular gyrus emerged, and neuroplastic alterations were induced in the adjoining motor-hand area in the frontal lobe including what would become Broca's speech area and the melodic speech areas in the left and right frontal lobes.

SYMBOLIC LANGUAGE

The angular gyrus sits at the junction of the posterior-superior temporal and the occipital-parietal lobes, and is critically involved in naming, word finding, grammatical speech organization, and is in part an extension of and links Wernicke's with Broca's area (Joseph, 1982, 1999e; Geschwind, 1965; Goodglass & Kaplan, 2000; Kimura, 1993). Through its extensive interconnections with the adjacent sensory association areas, the IPL/angular gyrus is a major convergence zone and receives and assimilates complex associations, thereby forming multi-modal concepts, and acts to symbolize, classify and name this material which is then injected into the stream of language and thought. The IPL/angular gyrus, in concert with Wernicke's area, transmits this information to Broca's speech area, which in turn organizes the immediately adjacent oral, laryngeal motor areas (Foerster, 1936; Fox, 1995; Joseph, 1992, 1999a).

As the right and left frontal vocalization areas are richly interconnected with the anterior cingulate vocalization centers, whereas the temporal lobe is tightly linked with the amygdala, once the angular gyrus of the IPL evolved, thus linking the language areas at the level of the neocortex, "limbic language" (emotional speech mediated by the limbic system) became hierarchically represented, yoked to the neocortex and subject to fractionization, temporal sequencing, and multi-classification (Joseph, 1999d,e). Wernicke's area was now able to communicate with Broca's area, with the angular gyrus injecting temporal sequences and assimilated associations into the stream of language and thought. Hence, in addition to artistry, and manipulating tools in a temporal sequential fashion, the evolution of the IPL/angular gyrus enabled humans to manipulate the internal environment and to transmit symbolic and linguistic impulses to the frontal motor areas controlling the oral-laryngeal musculature, thereby reorganizing Broca's area in order to vocalize units of speech.

As based on an analysis of tool technology, it can be concluded that Australopithecus, H. habilis, H. erectus, and Neanderthals did not possess the neurological sophistication for vocalizing complex human language, and had not yet evolved an angular gyrus or a functional Broca's area. Rather, the evolution of modern speech and the ability to express symbols and symbolic and religious-spiritual thought, symbolically, likely corresponded to the evolution of the peoples of the Upper Paleolithic, the Cro-Magon.

INFERIOR PARIETAL LOBE & ANGULAR GYRUS

The IPL/angular gyrus sits at the junction of the tactile, visual, and auditory association areas, and assimilates, sequentially organizes, and injects this material into the stream of language and thought,



The angular gyrus of the inferior parietal lobe (IPL) also plays an important role in language, as well as artistry, creativity, tool use and manipulation (Joseph 1982, 1993, 1999e; Kimura 1993; Strub & Geschwind 1983). Hominoids (and other non-human mammals) lack an angular gyrus (Geschwind 1965) and their artistic, creative, tool-making capabilities are limited to hammering with rocks, and throwing or manipulating leaves, sticks, and twigs (Boesch & Tomasello 1998; Fedigan 1992; Goodall 1990; McGrew & Marchant 1992).

Likewise, the tool making tradition of *H. habilis* was exceedingly primitive, consisting of rocks that had been banged together in order to arrive at a desired shape. Hence, it can be concluded that *H. habilis* had not yet evolved an angular gyrus. Moreover, as it can be also be concluded (see below) that *H. habilis* had not yet evolved the ability to speak in a manner even remotely resembling the speech of modern humans—an impression that is also bolstered by their poorly developed (pre-) frontal lobe, a region that contains Broca's expressive speech area.

The parietal lobe is considered a “lobe of the hand” (Critchley 1953; Hyvarinen 1982; Kaas 1993; Lynch 1980; Mountcastle et al. 1975, 1980) whereas the angular gyrus/IPL contains the motor engrams responsible for the programming of complex temporal and sequential hand and finger movements, including those involved in tool making and utilization (Critchley 1953; De Renzi & Lucchetti 1988; Gerstmann 1930; Joseph 1999e; Heilman et al. 1982; Kimura 1993; Strub & Geschwind 1983). Hence, given the above, it can be assumed that the angular gyrus probably slowly evolved over the course of the last two millions years in parallel with the establishment of handedness and hand-related activities as reflected in the evolution of tool technology. Given these trends and the association between right handedness, the left hemisphere, and language, it can also be assumed that not only the neural substrate for preferential hand use and tool making, but for modern human speech production and perception also gradually arose over the course of the last two million years.

The angular gyrus of the left hemisphere contains the “motor engrams” necessary for the performance of complex temporal sequential movements, including those involved in tool use and manufacture. In this regard, the angular gyrus/IPL is also a “lobe of the hand.” Hence, with the evolution of the angular gyrus, the ability to use the fingers and the hand, particularly the right hand, in tasks requiring a series of sequential steps, including counting, also evolved. In consequence, if the left cerebral angular gyrus/IPL were severely injured, mathematical ability would be abolished, as would the capacity to perform tasks involving temporal-sequential movements; a condition referred to as apraxia.

Non-human primates lack handedness or complex tool making or using capabilities. This is because the ability to make or utilize complex tools is dependent on the IPL/angular gyrus (Critchley 1953; De Renzi & Lucchetti 1988; Gerstman 1930; Geschwind 1965; Heilman et al. 1982; Kimura 1993). Hominoids lack an angular gyrus though they are endowed with an inferior-superior parietal lobe (areas 7b and 7ip), which, as noted contain neurons that guide hand movements, including grasping and manipulating. Hence, although they lack an angular gyrus, hominoids, such as chimpanzees make and use simple tools such as rocks, leaves, and sticks (Boesch & Tomasello, 1998; Goodall 1986, 1990; McGrew & Marchant 1992). Hence, although *H. habilis* and *Australopithecus*, were using rocks as simple stone tools some 2.4 to 2.6 million years ago (Hamrick & Inouye 1995; McGrew 1995; Susman 1994; Semaw et al. 1997; White et al., 1999) this does not indicate that they had evolved an angular gyrus.

Moreover, although perhaps as many as 60% of Australopithecines, 70% of *H. habilis* and at least 80% of archaic *H. sapiens* may have been right handed (Cornford, 1986; Dart, 1953; Toth, 1985), given the rather unvarying and still simplistic Oldowan/Acheulean/Mousterian stone tool technologies associated with these groups, there is still no evidence that these species had evolved an angular gyrus—though certainly trends in this direction are evident. Nevertheless, it was not until the Upper Paleolithic and the appearance of anatomically “modern” Paleolithic humans, including the Cro-Magnon, that tool making became literally an art and evolved beyond the use of rock and stone and complex multifaceted features were incorporated in their construction. It is at this stage of evolutionary development that we have clear functional and neuropsychological evidence for the evolution of the angular gyrus of the IPL.

Neanderthal tools were predominately “use-specific” and thus served, for the most part, a unidimensional purpose (Hayden, 1994). In fact, similar to children, the Neanderthals tended to use their mouth for manipulative tasks (Molnar, 1972; Trinkaus, 1992). Specifically, it Neanderthals would use their mouth for grasping and holding objects as well as chewing and softening items such as hides in order to soften them and make them more pliable. Although the Neanderthals used stone



“knives” it is not until the rise of the Upper Paleolithic that highly complex blade and completely new, diverse, and multifaceted tool (Aurignacian) technologies became the norm (Jelinek, 1989; Leroi-Gourhan, 1964; Mellars, 1989). Moreover, with the Upper Paleolithic peoples, the capacity to impose form, to visualize multiple possibilities and to use natural contours and shapes in order to create not just tools but a variety of implements, decorations, and objects, came into being, including complex representational and mobile art, complex scaffolding to support cave artists, and the sewing needle (Leroi-Gourhan, 1964, 1982) -all of which requires an angular gyrus/IPL and a motor cortex capable of controlling fine hand and finger movements; not only so that they may be fashioned but employed correctly.

In contrast, there is no evidence of a sewing needle or complex tool construction among Neanderthal populations during the Middle Paleolithic, and the capacity to visualize possibilities in regard to shape and form, was comparatively absent as well (Binford, 1982; Mellars, 1989, 1996). Thus, it is with the evolution of the Cro-Magnon, the angular gyrus and expansions in the frontal lobe which provided the neurological foundations for tool design and construction, the ability to sew and even wear clothes, and the capacity to create art, and pictorial language in the form of drawing, painting, sculpting, and engraving. It is the evolution of these tissues which enabled human beings to not only create visual symbols but to talk about them and create verbal and visual symbols in the form of written language and religious imagery.

Since there is no evidence for complex tool technology, complex abstract symbolic thinking, or an angular gyrus among Australopithecus, H. habilis, H. erectus archaic H. sapiens or Neanderthals, it thus appears that “modern” human linguistic and abstract symbolic abilities probably did not fully emerge until the evolution of the Cro-Magnon peoples. As in non-human primates, the thought processes, cognitive abilities, and language possessed by these earlier hominids, including Neanderthals, was likely emotional, limbic in origin, word-poor, and aggrammatical and lacking in symbolism or abstract expressionism. Until the very end of their reign, Neanderthals and other ancient hominids simply lacked the the neurological foundation to produce vocabulary-rich, complex grammatical speech, or the capacity to give shape and symbolic form to their spiritual thoughts or religious beliefs.

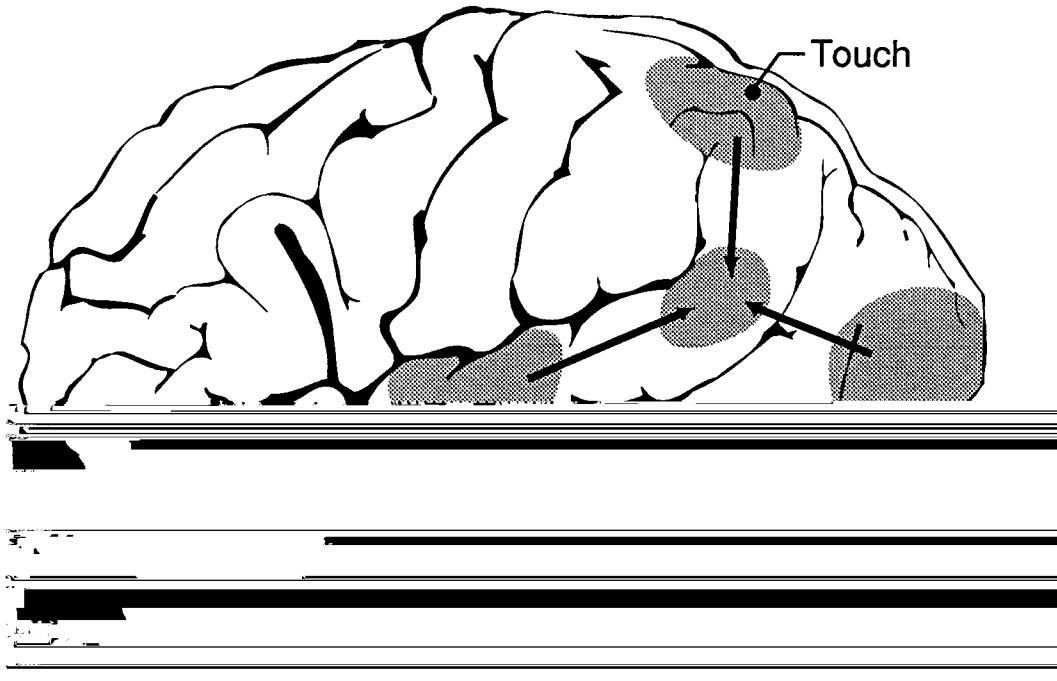


Figure 136. The inferior parietal lobe receives converging input from all sensory modalities and assimilates these associations to create complex multi-modal ideas, from Joseph, 1990.



Figure 137. (Above) *The entrance to Heaven*. By Hieronymus Bosch, 1500. (Right) *Sinners cast into hell* (by W. Blake).





Figure 138.
*Jesus presiding
over the
judgement of
those cast into
hell (by Hans
Memlinc).*