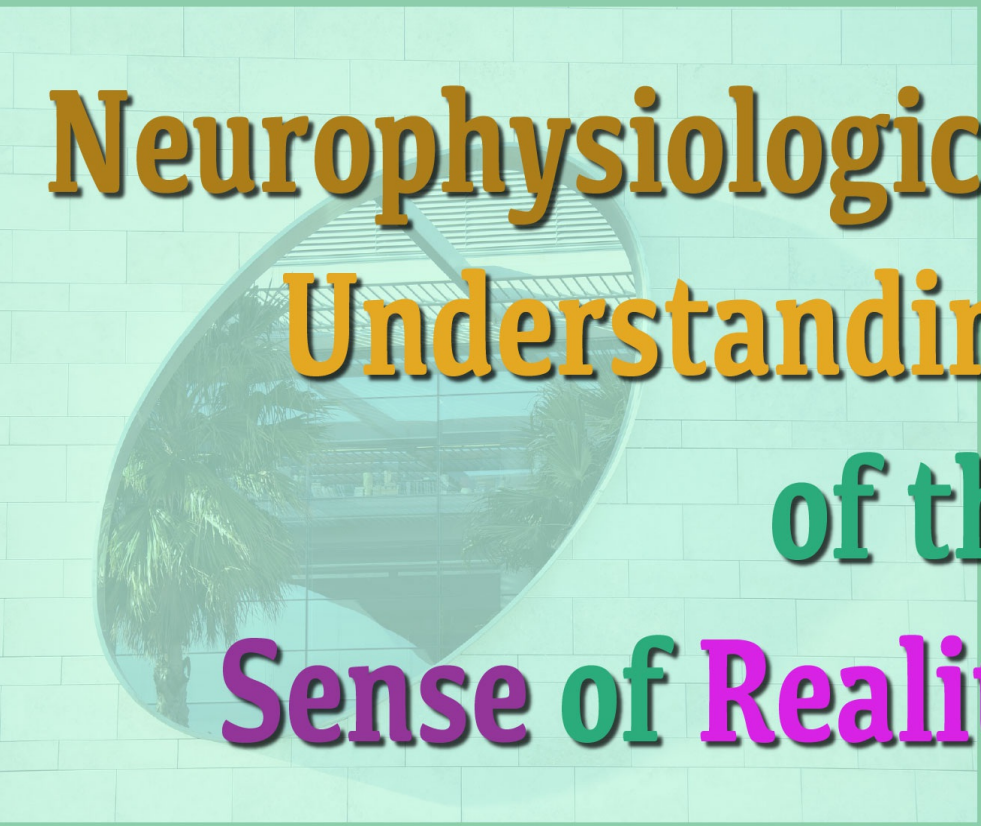
Theories of Symbolism



Neurophysiological Understanding of the Sense of Reality

Charles A. Sarnoff Md

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"The heart has reasons that reason cannot know."

Pascal

"Love looks not with the eyes, but with the mind;
And therefore is winged cupid painted blind;"

Shakespeare

INTRODUCTION

Reality as it is sensed by the mind is the product of interpretation applied to perception of sensation both internal and external. Mutual agreement, on a codified single shared way of interpreting perceptions to create a sensed reality, is the basis for cultural identity. Indeed most cultures are organized around a single system for establishing a sense of reality, which is supported by its mythology. Individual members of these cultures may also have a personalized realistic sense of danger, independent of group cultural dictum, in their interactions with natural reality in the world matrix (physis).

Western Civilization is characterized by the presence of a dual group system for arriving at a sense of reality. In the first system, there is an infused reality, passed down through mythological conventions, which becomes the basis for a culturally shared means of evaluating the reality of new information and for creating compatible explanations for eldritch natural phenomena, such as Niobe's despair as the source of weeping stones. In the second system, explorations of the world matrix have been codified to create in memory a shared scientific worldview, against which the reality value of new interpretations of inputs can be evaluated. This state of affairs has provided the philosophical basis for the current stage of Western civilization, in which religious beliefs have been preserved in the face of the introduction of contradicting information generated during the development of science.

CLINICAL EXAMPLE: DUAL REALITY

During a discussion about lateness with an eight year old patient, there was introduced the topic of the great glacier, which had left the long hill upon which my office stands and which had delayed his arrival that day. I explained that the glacier had been at its height ten thousand years ago and had left this hill as a terminal moraine as it receded. He mused half to himself. "5750 years" was what I think I heard. He repeatedly mumbled the number. He clearly was bewildered. Finally he spoke up, explaining to me that I must be wrong for God created the earth some 5700 years ago and "There was no earth ten thousand years ago". His referent for reality and mine differed. His sense of reality used transcendent concepts as the basis for the evaluation of the reality of interpretations of new inputs. My referent was derived from the conventions of "scientific objective natural reality" as the source for the interpretation of new inputs. Dual reality is so pervasive in Western culture that the concurrent acceptance of contradictory truths is often to be observed in professors of science as well as pastors.

Let us explore the origins of the dual reality of the West. First we will look at historical origins. Then we will search out the early childhood origins of the cognitive skills, which persist, both in their functions and through their paradigms, in support of the cognitive capacity to tolerate contradictions in consciousness. Then we will review the role of symbols in the creation of the memory panels that become the sources for comparisons in establishing whether an input represents reality. Finally we will review neural mechanisms and structures, and the brain organization that makes possible the brain's tolerance and acceptance of contradictory perceptions of reality.

THE ORIGINS OF THE DUAL REALITY OF THE WEST

A BRIEF HISTORY OF SYMBOLS AS THEY APPEAR IN DREAMS

Western civilization with its dual reality evolved out of an earlier culture whose group sense of reality was defined in terms of symbols understood to be messages from gods.[1]

EARLY TRANSCENDENT DREAMS

The earliest reported dreams have transcendent contents. For example Jacobsen (1946) tells of a

dream of Gudea, King and Ensi (Ensign of God) of Lagash (circa 2144-2124 BC). Gudea had noticed that the ebb and flow of the Tigris River was amiss. His intensely pietistic world set the stage for him to seek a solution to the problem through a temple dream. "In the dream he saw a gigantic man with a divine crown, with wings like a great bird, and with a body which ended below in a flood wave. To the right and left of this man, lions were lying. The man commanded Gudea to build his temple" (p.189). Day breaks in the dream. People appear and show details of the building. After Gudea awoke, he went to a dream interpreter because some of the details were unclear. The interpreter sent him back to the temple to dream some more. It took several nights, but eventually the god (Ningirsu) appeared to tell in detail "what units the new temple should contain" (p.191). This story is not presented to illustrate a myth, but to give an example of that which was acceptable as a reality interchangeable with ordinary events of the day in the ancient kingdom of Lagash.

In early Christian tradition, there were many intensely transcendent dreams, which informed the sense of truth and changed the shape of culture. An element of a widely held deistic symbol net that even today shapes a very influential sensed reality is St. Joseph's dream—[(Mathew 1:18-25)] "Mary was betrothed to Joseph; but before they came to live together, she was found to be with child. Joseph, being a just man decided to divorce her informally. Soon after, an angel appeared to him in a dream", saying "Joseph, son of David, do not be afraid to take Mary home as your wife, because she has conceived what is in her by the Holy Spirit. She will give birth to a son and you must name him Jesus, because he is the one who is to save his people from their sins." In another influential dream, St. Paul introduced Christianity across the Bosphorus after he dreamed that a Macedonian man had bid him "Come over to Macedonia and help us", and the emperor Constantine converted both himself and the Roman Empire to Christianity in response to a message in a dream from an angel who told him that he would achieve victory in battle under "The Sign of the Cross". So strong were dreams believed to be true messages from god that they became inspired turning points in world history.

ARISTOTLE INTRODUCES REALITY TESTING AS A BRAIN FUNCTION

The classical world saw reality in the revelations of myth, and in communications from gods through transcendent symbols found in apparitions and dreams. Into the midst of this world, Aristotle (Ant—On The Soul) introduced a way of organizing and interpreting sensation by which he intended to

displace the strategies of transcendence in determining reality. The potential for this interpretation of sensation was placed by Aristotle in an internal mental construct similar to the Psychoanalytic concept of the ego. He called it the soul. It could identify reality through ". . . the judging capacity which is a function of the intellect and of sensation combined . . ." (p 181) This judging capacity is called in current theories "interpretation of perception". Aristotle described an hierarchy of validity for the perceptions and interpretations available to the reality testing "soul". Most valid was ". . . perception of proper objects . . ." beyond the boundary of the self. Such external perceptions were ". . . only capable of error to the least possible degree". (p 163) Less validity for the capacity to see reality occurs when internally derived memory elements become their source. When ". . . for the thinking soul, images take the place of direct perceptions and when it asserts or denies that they are good or bad, [and] it avoids or pursues them." (p 177) or when, ". . . because imaginations persist in us and resemble sensations, living creatures frequently act in accordance with them . . . because the mind is temporarily clouded over by emotion or disease, or sleep." (p163). Aristotle differentiated such fantasy elements from reality elements on the basis of the latter's "capacity for exciting movement in space." (p 181) (See also Kant's causality (V.I.) In these contributions of Aristotle lie philosophical sanction for the development of natural science in which the empirical study of objects in the physical world replaces intuitive memory based on fantasies, remembrances, prescribed thinking, preconceptions, infused data, ordained beliefs, illness, and dreaming. These inputs may feel real, but are more subject to alteration and clouding than consensually validated telereceptor (vision and hearing) based perceptions.

ARTEMIDORIS INTRODUCES A SCIENTIFIC APPROACH TO DREAM SYMBOL STUDIES

Non-religious mantic transcendent dream symbols were recognized to exist during the age of Aristotle and the GrecoRoman period (350BC to 200 AD). Their perceived value in comparison to deistic messages had caused them to be dismissed as worthless in spite of popular beliefs in the predictive value of dreams, which had persisted from prehistoric traditions. The hegemony of religious "truths" in dreaming was challenged indirectly by dream interpreters, when they tried to find clues to the future of the dreamer in his dream symbols.

One dream interpreter, Artimedorus of Daldis (First Century A.D.) applied traditional survival oriented reality testing and the Aristotelian approach, which had become a part of the intellectual

climate of his time, to the study of these non-deistic dream symbols. He attempted a scientific study of the mantic power of dream symbols to predict the future. He collected thousands of dreams from all over the known world in search of dream symbols, whose predictive import might be learned through careful studies of their appearance in successfully interpreted premonitory dreams. He described his discoveries in a book titled "The Interpretation of Dreams." (See White (1975). This book was the source of the title of Freud's Dream Book). In addition to dream symbols with mantic power, he described a category of dream, the Enhypnion, which had no power to predict the future and was not god inspired. This type of dream was motivated by "an irrational desire" or "an extraordinary fear" (p. 184) on the part of the dreamer. Such dreams were considered to be of little value by Greek dream interpreters. The concept of god's influence as the only source of dream content was challenged by these findings.

ST. AUGUSTINE[2] REINFORCES TRANSCENDENT REALITY

Aristotle's influence on logic had been strong. However it had come too early. Science, in the absence of germ theory, could not explain plagues. Nor could it predict the currents in the narrow strait at Aulus (Modern Chalkis), or divine the whims of the winds. The wills of willful fickle gods explained all and in the process supported the priests of sacrifice. As a result Aristotle's influence dwindled to the point that by the 5 th century AD, Western thought came to be dominated by the truths of transcendence. This was reflected in the philosophy of St. Augustine, who taught that in seeking truth one must depend on the sensations of sense experiences including memory, which are internal. These included awe, and revelation experienced as memory. His memory borne proofs of the existence of God were derived from conceptions drawn from biblical sources as well as mystical experience in which Augustine (400 A.D.) ". . . attained the eternal wisdom which abides beyond all things." (p 171) Thus stood open the gates of faith within which dwelled a talisman to blunt the wiles of the fearsome predators of night with prayers, and empower weak individuals with the strong weapons of group belief. Here is the narrow valley in the circuits of the mind, where individual men enter and armies leave. Beyond this defile is a world of fantasy beliefs. Here is Avilion, and the land of the Tuoni. At this world's edge men die in defense of balustrades, crenelations and keeps that are only glimpsed in dreams.

AVERÖES CASTS THE APPLE OF DISCORD

Augustine's sense of reality held sway in Europe until the 12th century, when the Islamic philosopher Averöes (born Cordova Spain 1120) awakened the two realities concept while studying the writings of Aristotle. The effect of the intrusion of the Aristotelian concept of natural science into the organic fundamental religious world of the medieval temperament has been described by Glatzer (1994). He noted that the sense of reality—developed as a result of the Aristotelian incursion during the waning of the middle ages—was based on truth derived from Aristotelian logic, as well as truth guided by religious belief.

Averöes[3] stood at the cusp of the intersection of these conflicting planes of thought. He was in his time thought to be the most authoritative commentator on a rediscovered Aristotle. He used both truth born of faith and empirical truth in his writings without overtly defining and differentiating empirical from infused transcendent truth. As he used them, these truths were not necessarily mutually exclusive.

The rediscovery of Aristotle, and Averöes' use of two truths opened the way to introduction of the scientific attitude. This threatened to alter forever the reach of the medieval mind. The problem peaked when a 13th century Latin translation of the major works of Aristotle accompanied by the commentaries of Averoës became available to Western scholars. A philosophical school, the Averoists, arose which used this new source of information in support of the contention that there was knowledge that was independent of revelation. Such a belief was deemed to undermine the power of truth in religious doctrine. Restoration of Western confidence in empirical knowledge threatened to undermine transcendent reality. Orthodox thinkers both Catholic and Jewish saw this challenge from the Averoists' interpretation of Aristotle as something that required resolution.

Maimonides[4] (b. 1135), representing rabbinic Judaism confronted Aristotelian rationalism in its Arabic form with writings which supported God and creation. His work profoundly influenced St. Thomas Aquinas.

ST. THOMAS SAVES THE DAY

St. Thomas Aquinas[5] (born Italy 1225) succeeded in allaying the concerns of the clergy in the face

of the Averoist challenge that there was knowledge, based on the senses that was independent of transcendence. Aquinas (1256-59) held that though all knowledge both phenomenal and spiritual begins in sense data, it becomes intelligible only through interpretation by the intellect. "Knowledge . . . begins in sense . . . , it is completed in the *intellect."* (p 12) In effect, he moved the primary venue for the perception of truth from the organs of *sensation,* both internal and external, to a defining locus in a place within the mind, that interprets.

Viewed from a Psychoanalytic perspective, Aquinas' approach speaks of an interpretation of sensation, which imparts a psychological sense of reality (see below) at a place within the mind removed from the primary modalities of sensation. As a result of this placement the infused truths of faith and the deduced truths of Aristotelian sense experience become syllogistically equivalent in validity, fully compatible, and capable of coexistence. As a result of this, truth, based upon interpretations by the intellect, makes possible the understanding of things immaterial such as the human soul, angels, and God in the same sense that natural phenomena can be understood. The former requires revelation. The latter requires physical sensation. Truth becomes that which one interprets sensation to be. As Aquinas (1258-59)[6] described it, ". . . as the beginning of natural knowledge consists in a knowing about creatures as a result of sense perception, so the beginning of the knowledge that is given from above consists in the knowing of the first truth by means of *infused faith."* p 292]

Each truth serves the practices of its beholders. From the point of view of transcendence, knowledge becomes available to man through guided interpretation, which makes each man's choices, revelation based manifestations of free will. From the point of view of science, interpretations of reality sensations can be blurred by prior knowledge leaving some things unknown and some things unknowable or unconscious and expressed by substitute symbols. The latter is a condition amenable to psychotherapies that remove blurring influences.

The introduction of Aristotle's science into Western culture in the 12th century, and the resolution of its contradiction of faith by St. Thomas was paralleled by cultural acceptance of two truths. This is reflected in Meisner's (1992) note that "In 1554, advising [a] religious superior about one of his tormented subjects, Ignatius Loyola wrote, 'Don't be troubled, and don't get up because of these noises, or lose any sleep. The devil can do nothing without God's permission. If, however, some of these terrors are

caused by a natural disposition inclined to melancholy, a doctor should be consulted." (p 200) With this the door was opened for Freud's (1923) interpretation of a "Case of Demoniacal Possession" as an example of mental illness 350 years later.

PSYCHIC REALITY AND SENSE OF REALITY

The inner interpretation of reality as introduced by Aquinas is called psychic reality by psychoanalysts. It takes precedence over reality itself because there is a capacity of the mind to cloak interpretation with an affect called *sense of reality,* which experienced internally, can make interpreted awareness seem to be more 'real' than real.

PSYCHIC REALITY

Psychic reality as used in this paper may be defined as the inner experience of outer reality. As a result of the phenomenon of psychic reality, thinking beings can harbour error and have no sense that that which one feels to be true is only a far cousin to those truths, which can be touched. At its best, psychic reality is less than reliable. It can be influenced by training, philosophy, and inhibition. It keeps open the possibility of a sensed reality-based on memory alone.

Zimmer (1975[7]) described the experience of psychic reality thusly—

> "Like vapour they and their creation come to pass, flow, and pass away. That is the true nature of . . . (the personal apprehension) . . . of the process of life . . . as it is experienced by us with our individualized, limited and perishable consciousness, awake or asleep, remembering or forgetting, acting or suffering, laying our hands on things, yet ourselves slipping out of our own grasp." (p 150)

Aquinas equated spiritual universals with scientific observations. This nod to Aristotle replaced the extreme belief that religious realism was independent of human mentation. It provided a logical basis for acceptance of a dual reality and supported the retention of religious belief in spite of incursions from extreme Aristotelian reality. Aquinas thus had set the stage for our cultural tolerance for conflicting sensed realities that exist side by side.

LATTER DAY CONTRIBUTORS

Kant (Born, Germany, 1774)[8] also tried to resolve the problem of two standpoints for truth. In his "Critique of Pure Reason", Kant (1781) divided reality into a "phenomenal world of appearances" (8XCVII) and a "noumenal world of things in themselves" (8XCVII). Events in the phenomenal world are integrated into a chain of causality (Aristotle's concept of initiating movement) and are fully predictable. In the noumenal world "events may take place in the absence of any antecedent causal determinants." (8XCVII) The latter leaves room in logical thinking for myth and deity based contributions to the interpretation of phenomena. "Scientific experience and knowledge pertain to the phenomenal world; moral experience and spiritual knowledge pertain to the noumenal." (8XCVII)

The Scottish Moralists[9] further addressed the origin of truth. They placed emphasis on the role of symbols in carrying ethical truths and moral principles to future generations and the need for symbols in recognizing manifestations of morality in behavior. For them, memory of moral truths is carried across generations through symbols, which are used in interpretation of physical sensations in support of transcendent reality. This is an adaptation of Aquinas' concept that interpretation of sensation based on 'infused faith' can be used to harness the power of memory to synthesize psychic reality. The guided truths of infused faith shape behavior as a result of the equation of the myth bearing symbols of memory with the harder truths and causalities of the phenomenal world.

Modern theories about dream symbols are derived from two worlds of truth. On the one hand there is Freud's (1905) description of the natural origins of fantasias. On the other hand there is Savary's (1984) transcendent view that dreams are an ". . . invitation . . . to a relationship with the divine . . . ." (p 4)

TOLERANCE FOR DUAL REALITY:
EARLY CHILDHOOD ORIGINS

The factors in the ontogenesis of human cognition that makes it possible to tolerate dual reality remain to be explained. Insight into childhood origins for tolerance for a dual reality in our culture begins with Freud's introduction of a method for the reconstruction of mental function in early life from manifestations found in adulthood. The concept of primary and secondary process thinking and their

parallel maturation in early childhood results from this approach. (Freud 1911A)

One of the characteristics of primary process thinking is of special interest to us. This is the ability to tolerate simultaneous conflicting concepts in consciousness. Persistence of a regression to this early cognition can make attribution of a sense of reality to both of two conflicting realities acceptable to an adult. Of interest also is the transition from primary process dominance to secondary process dominance. During maturation, this shift enhances the ability to appreciate natural reality and offers a potential challenge to the idea that there are two realities.

PRIMARY PROCESS THINKING

Freud (1900a) used the term Primary Process (p 603) to refer to the context of mechanisms that define unconscious mental life. Primary process is characterized by free energy expressed in thoughts and actions whose motivations are uninhibited by logical causal considerations. This form of logic underlies tolerance for thinking which would support influences (numinous), which are not physically demonstrable to be causal. The characteristics of primary process thinking (Freud (1915E) are: mobile energized attention (cathexes) which through displacement and condensation are shifted from one idea or object to another without regard to the influence of external natural reality. The causality that propels this is based on affect not fact and is under the sway of the pleasure principle. The causality of objective reality provides minimal influence. There is timelessness, no negation, and no variation in degree of certainty. In this type of thinking multiple ideas can be funneled into and expressed as one idea; and awareness focused by drive energies can be shifted and redirected to new ideas or objects in a way that results (P 186) in loss of attention to (countercathectic repression of) the original ideas or objects to which attention cathexes had formerly been directed. This is the displacement required for cryptic symbol formation.

From the standpoint of "dual reality" it is important to note that disparate wish impulses appear in primary process thinking, which "exist independently side by side, and are exempt from mutual contradiction." (P. 186-7) As a result contradictory ideas can be held simultaneously in the mind. This is a possible paradigm for tolerance of dual reality. Primary process thinking is derived from haptic cognition and shares its vicissitudes. Its sense of reality does not require memory panels derived from

perception of external sensations.

SECONDARY PROCESS

The context of mechanisms that police the passage of unconscious contents into consciousness was called by Freud (1900a) Secondary Process Thinking. (P 603). It is derived from telereceptor cognition and shares its vicissitudes. Secondary process reality takes into account sensations from and memories of the natural world. It is characterized by a search for internal consistency in conscious thought. At times this conformance is achieved through psychoanalytic symbol formation, which permits masked expression of wish fantasies, which have been suppressed as part of the mature mind's pursuit of pragmatic imperatives. The psychoanalytic symbols of mature secondary process are essentially passions of the mind clothed in the uniforms of culture. The characteristics of secondary process mechanisms are:

Inhibition of drive discharge.

Exclusion of displacement and condensation.

Enablement of communication between ideas, which permits ideas to modify and influence one another. In secondary process thinking this communication favors a non-contradictory sense of reality, which is influenced by remembered reality perceptions in the place of infused truths.

A growing child does not switch from primary to secondary process thinking. Primary process thinking does not decline while secondary process thinking replaces it. Both strengthen and mature side by side so that both primary and secondary process thinking persist in the mind of the adult. The products of primary process mechanisms that underlie symbol formation are modified in the direction of reality influences. The existence in parallel of two complete cognitive processes underlies the capacity to support two senses of reality.

HAPTIC AND TELERECEPTOR SENSORY INPUTS

The impact of internal factors (i.e., evocative symbolism, inner drives and haptic sensation) on the evaluation of reality while awake, diminishes with maturation.

Memory and present consciousness change to conform closely to natural reality (physis) with the maturation of telereceptor sensory inputs. Secondary process mechanisms are strengthened as a result. Telereceptor sensory inputs are inherently fixed, verifiable, repeatable, and transmissible. They can be consensually validated. Their immutable nature overcomes intuitive interpretations of perceptions. As a result, cognitive content becomes more fixed. The main trend during maturation is enhancement of the influence on memory of telereceptor (visual and auditory) mediated reality perceptions from the natural world. With maturation, natural processes and realities beyond self-boundaries become more and more influential as they replace intuition and infused knowledge in the formation of the memory panels that are used in making comparisons in evaluating psychic reality.

Memory, which shapes interpretation, serves both haptic and telereceptive masters as well as being involved in the creation of consciousness. Current telereceptor reality perceptions challenge the validity of infused memory recalls. The inner experience of outer reality changes with growth as a result of a developmental reshaping of awareness that replaces intuition with natural reality. Recognized meanings for perceptions, based on interpretations influenced by natural contents in memory, enhances the transition of awareness into consciousness.

Awareness of the sensations of the real world is shaped into those memory panels of conscious psychic reality, which are used for judging reality, by interpretation. The contents of the memory panels are forged from an amalgam of four factors. These are current sensation (external and internal), past memory encoded as symbols that represent infused truths derived both from religious revelation and ensconced scientism, abstract hopes that symbolize the future, and a sense that thought (including religious teachings) symbolizes reality.

In sum, aristotelian scientific truth aims at a sense of reality-based on recalls remembered from telereceptor sensations. It may be invaded by scientific tradition. Platonic transcendence aims at a truth derived from infused tradition driven psychic reality. It gives way slowly to scientific challenge. Aquinas postulated a seat for both truths in the intellect, which interprets the contents of memory through a perceptual system that produces the affect called 'psychic reality'. This enables a tolerance for culturally recognized two truths in near equation, one better for interpreting numinous transcendent reality, the other better for interpreting external perceptions.

HAPTIC AND TELERECEPTOR COGNITION

The symbolic interpretation of percepts is influenced by memory elements. Natural symbols are memory elements derived from past telereceptor sensations, which shape interpretations of new sensations to represent external reality. Transcendent symbols and the symbols of infused science use new sensations to reinforce preconceptions. The interpretation of content based on transcendent symbols is strengthened by the presence of haptic inner sensations such as awe, hallucination and other accoutrements of mysticism.

An awakening of a sense of reality, appropriate to haptic experience at the narcissistic level of development, influences intuitive interpretation of what is seen or sensed. In this circumstance, philosophically undifferentiated numinous memory and memory for externally perceived phenomena are experienced as haptic sensations because as memories they arise from within the body. A feeling of reality, influenced by recall of the experience of images and concepts shaped by earliest childhood's primary process thinking tolerance for the fantastic, can be applied equally to both.

Immature psychic reality in adulthood is a remnant of tolerance for, persistence of, or regressive reassertion of organizations of reality perception encountered during early development. Such tolerance can encourage acceptance of persistent contradiction between infused consensual and perceptual realities and can produce fantasy influenced symbolic interpretations of sensation. Note the emphasis on symbolic interpretation in the following examples of psychic reality in a young child.

Aviva was four and suffering from an infantile zoophobia for which she was in treatment. Her sense of reality was so poor that her actions were primarily motivated by fantasy. At one point during a therapy session she ran from the playroom to her mother screaming that "Dr. Sarnoff is a bear."

A father and his four-year-old son took the subway to the circus. Eyeing the subway entrance, the child declared "That's a cave. I read about caves in a book with mommy." As they approached the first level down, a train came noisily into the station below. "There's a dragon in this cave declared the tot." He seemed reassured when it was explained that the sound came from a train. They proceeded down, only to be met by a running crowd of adults heading for the exit. He tore his hand from his father's and began to run with the crowd. When overtaken, he proclaimed "If this isn't a cave and that's not a dragon, why

are these people running?"

HAPTIC AND TELERECEPTOR COGNITION INFLUENCE ADULT SENSE OF REALITY

The paradigm for sense of reality first occurs during the borderless narcissistic period of early childhood, when inner (haptic) sensations dominated the perceptual processes, and the all about and the all within were fused and experienced with all *the "fierce vexations of a dream,"*[10] This dreamlike *sense of reality* persists even though the maturation of cognitive skills makes possible a *boundary* between external perceptual reality and the inner world consisting of haptic experiences, memory and fantasy informed by hope. The inner world persists in memory panels located in prefrontal cortical areas whose contents are experienced as real. Experienced adult psychic reality is the product of persistence of or *regressive reassertion* of the feeling of psychic reality encountered during the originating experiences of psychic reality in the child. Its persistence makes possible the conversion of a mixture of perceptions, hopes, and memories into an intrapsychic phenomenon experienced as reality. Such residual cognitive paradigms support a sense of reality, which gives the feeling that an experience is real.

EARLY COGNITIVE PARADIGMS AND TOLERANCE OF DUAL REALITY

Recent scientific studies (Werner (1940,1963), Yahalem (1967), and Kubie (1953) have identified stages during early child development that underpin the ability to accept multiple realities, such as the dual realities of our civilization. One such stage encompasses the shift of dominance between haptic and telereceptive cognition. In the earliest experiences of the child, haptic (close in, internal) sensations such as proprioception, protopathic sensation, vibration, heat and cold, and affects, dominate in the recalls of early affectomotor memory. They are not subject to external corrections. Haptic memory elements that participate in this form of perception are at first not sensed to be representations. Rather the retrieved memory is early on experienced and later on recalled as syncretic with the original experience or perception. Reality interpreted in the light of memory, which has been encoded according to the principles that guide haptically acquired percepts in early childhood are highly personalized and limited to sensations from within the body. The haptically based initial world of the infant is as a result unshared, and self centered. It lacks a remembered concept of the self immersed in a consensual world of reality, to be used as a reference for interpretation and communication. Sleeping or awake haptic

percepts cannot naturally be confronted by perceptions of the external world. There is no way of consensually validating haptic percepts as there is for vision and hearing. This leaves a paradigm for interpretation of meaning derived from fixed "infused faith" (scientific or religious) for content, intensified by awe to create an affect of reality.

This contrasts sharply with reality interpreted in light of memory encoded according to the principles that guide telereceptor based percepts. (Visual and auditory perceptions at a distance that can be compared and shared.) The latter, including fragile shared myths (scientific or religious fixed ideas) participate in the creation of a differentiated reality tested external world. (See Kubie (1953)

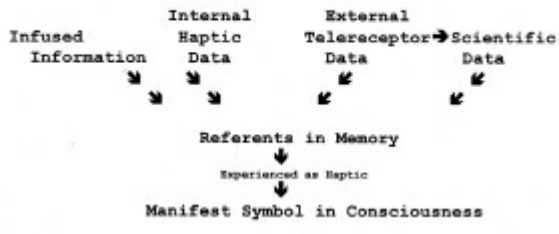
During the first months of life, there is little in the memory to give interpreted shape to the diffuse sensory experiences that are the phenomena of telereception, (incipient vision and hearing). As a result early in the first year haptic cognition dominates. Telereceptor based cognition, which operates with consensually validatible sensations, and which has the potential to focus on conscious contradictions are at first thinly cathected. They are relegated to unimportance and overwhelmed by the diffusing effects of synaesthesia and physiognomic thinking. The gradual enhancement of stored items in memory, which can be used for the interpretation of visual and auditory sensation, enabled the creation of panels of telereceptor based perceptual forms. With the accumulation of panels of sustained visual memory elements based on telereceptor sensations and the development of verbal concept memory, confrontation about shared experiences becomes possible. When these become stabilized, recognizable and interpretable they enhance interpretation with preconception and opinion. At that point concepts become subject to verbal confrontation, challenge and correction. This early process provides a paradigm for the intellectual verbal confrontations of secondary process thinking, and the construction of a stable inner world of memory that represents phenomenal reality and can be codified into memory panels to be used as the basis for defining new inputs as real.

SYMBOLIC FORMS

The memory contents to which new inputs are compared during the activation of the sense of reality consist of symbolic forms in memory. These are images that are derived from sensory and infused inputs, which become the basis for comparison in judging whether or not a new image or concept is valid.

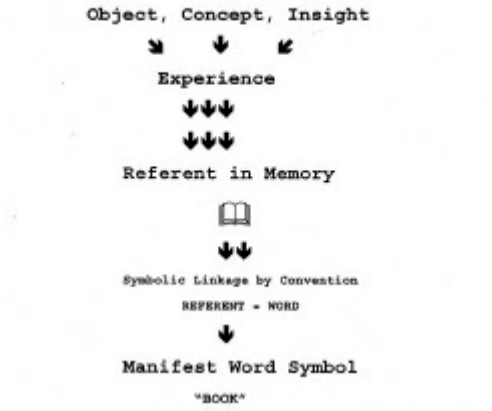
The judgment that accepts the truth of an interpretation is guided by the accepted theoretical constructs of a culture and the intrapersonal needs of persons.

Chart A. General Symbol Formation

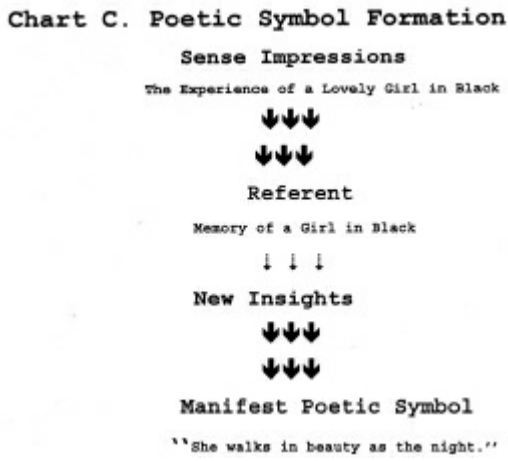


THE SIMPLE SYMBOL'S manifest representation has a culturally determined linkage to the content of its referent. These linkages are determined by *conscious* convention. An example of a social convention based symbolic linkage would be the communicative spoken word. The sources of the referents to which words refer are the objects, concepts and insights that are shared by and define the society of the symbolizer. (see chart B)

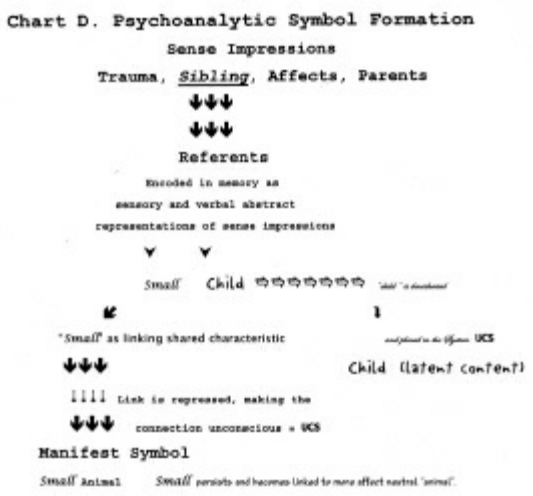
Chart B. Simple Symbol Formation



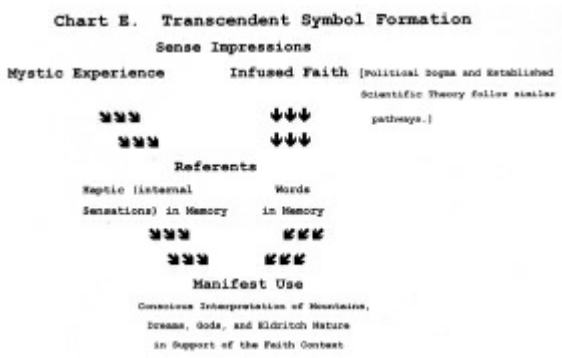
THE POETIC SYMBOL'S manifest representation is consciously selected by poets from facets of the meanings of known words chosen to convey innovative meanings. The sources of its referents are extraordinary new insights and concepts, which expand the worldview of a group or culture. Poets are artists who are gifted with a talent for discovering new ways of using words to represent new insights. Through these somewhat cryptic forms society is introduced to new referents. The freshness of these representational insights introduces new symbolic uses for old words. An example of poetic symbolism would be the phrase "She walks in beauty as the night"[11] used as a description of a young woman dressed in black. Poetic symbols invigorate language, for in Emerson's (1844) phrase "Every word was once a poem." (p. 455) (See Chart C)



THE PSYCHOANALYTIC SYMBOL represents inputs, which are associated with sensory experiences of intolerable affect. The manifest content of the psychoanalytic symbol is the product of a protective choice in which elements, which convey less affect than the painful memory trace which they represent. The referent contains sense experiences of recent traumas, current wishes and past experiences, affects, parents, sibs, and other important figures from the childhood of the symbolizer. The link between referent and representation is unconscious. An example would be a small animal representing a sibling in a dream. (see chart D)



THE TRANSCENDENT SYMBOL derives its manifest representations from reverence for landscapes, from the avatars of gods, the songs of birds, and the labors of humble men and sacred dreams. The impelling source of the referent is understood by initiates simply to be a "God" or his works. These images are linked to referents according to principles fixed by the traditions and conventions of "infused faith"[12], consciously known to initiates, though at times thought of by common men as a mystery. Their manifest symbols are employed in support of the beliefs of initiates in a transcendent being beyond the boundaries of the self. (See Chart E)



SYMBOLIC FORMS IN THE CREATION OF DUAL REALITY

There is a clash of explanations for the sources of their referents that sets transcendent symbols apart from poetic simple and psychoanalytic symbols.

Transcendent symbols are understood to be derived from referents whose origins lie within a sphere of a "reality" that transcends man. They are held by theorists immersed in the ways of transcendence to be messages from God without a point of origin in the brain. An example would be the use of mountains in the paintings of Frederick Church, who consciously painted landscapes to illustrate the grandeur of God's creations. In regard to the latter, Savary (1984) describes dreams as coming ". . . from an origin other than one's own conscious ego . . ."(p 3) which is ". . . an invitation given by the Source of our life and destiny calling us on a spiritual journey toward greater consciousness, and to a relationship with the divine . . ." (p 4); In essence (Psalm 1) "The heavens declare the glory of God; and the firmament showeth his handiwork."

Simple symbols are sensed to be real by comparing them to referents determined by convention. Poetic symbols are linked to their referents by creative insight. The referents (latent contents) of psychoanalytic symbols are understood by the scientific world to be memory banks, which contain elements too affect-laden to be represented directly. These memory panels can contain fantastic, incomplete or false images of reality. They have the potential to inspire symbols, which offer idiosyncratic

truths, which undermine reality. These can be uncovered and corrected through psychoanalysis using free association. For instance the meaning of a mountain in a dream or landscape can be traced to prior experience of the dreamer, through analysis of free association to the dream symbol, and seaweed seen as hostile can be resolved into the anger of a child for a mother who left for a little while.

Western culture supports systems for defining truth, which simultaneously can see truth in scientific natural and in experienced religious realities, as well as all forms of infused truth, such as an individual mother's concept of a healthy diet. There are champions for each system and supporters of both simultaneously are not at all rare. To contain such diverse types of symbols in one logical system, it is necessary to accept the existence of two simultaneously contradictory truths through a philosophical orientation that supports the coexistence of the scientific method, and an infused religion, which is reinforced by the presence of experienced externally presented symbols and icons. This requires cognitive systems, which match recalls and inputs with remembered worldviews to activate the affect of sense of reality, as in "It feels true". In this circumstance manifest symbols with veridical telereceptor based referents and manifest symbols supported by transcendence based referents as well as infused knowledge can be felt to be equally true.

NEUROSCIENTIFIC MECHANISMS AND STRUCTURE THAT CONTRIBUTE TO THE SENSE OF REALITY

INTRODUCTION

Sense of reality refers to the affect associated with the recognition of mental representations as real. These include derivatives of haptic perception in memory as well as immediate telereceptor perception. An interpretation does not have to be congruent with natural reality (physis) to be sensed to be real.

Sense of reality is prone to error. It is a residuum of infantile omnipotence. The capacity to sense reality was considered by Ferenczi (1913b) to be an ". . . hallucinatory omnipotence . . . that survive(s) into adult life." (p223) ("Hallucinatory omnipotence" refers to a small child's capacity to create images that feel as alive as the fall of day, such as the fearful monsters of the twilight moments that precede a child's sleep.) ". . . (P)ersistence of (this) period of unconditional omnipotence." (p 219) into later life may be seen in the ability of the older child or adult to tolerate a mature mind's creation of false

"realities" through distorting interpretations. ". . . attention is arrested above all by those objects of the outer world that on the ground of resemblance remind (one) of (one's) dearest experiences." (p 228)

Inputs detected by the source organs of perception, may be recognized as real, when they bear a resemblance to the content of a previously acquired memory panel. A memory panel consists of an organization of memory traces that by experience or convention are consensually validated to be true as a result of convention or shared experience.

SOURCE ORGANS OF SENSATION

The source organs of sensation, include external telereceptor receptors (visual and auditory) and the internal servants of haptic memory. Both internal and external stimuli can be interpreted to be equally true. What is required is that either set of stimuli pass comparison with validating mnemic traces contained in memory panels.

Freedberg (1998) described the scanning function involved. "When we see an image, we strive to constitute it according to some graspable form with which we are already visually acquainted . . ."(p 281) We try to convert it into a symbol for that which we already know.

Memory panels offer comparison criteria for validating inputs as true. They are derived from two sources. There are those that are based on "knowing about creatures as a result of sense perception" of natural reality (Aquinas v.s.), and there are those knowledges, the first truths of which have beginnings in "infused faith" derived from deistic authority. (Aquinas v.s.) Both sources may be encoded in memory verbally. As such when retrieved they are experienced as haptic traces.

Recognition of similarity through comparison to memory panels generates "sense of reality". Attribution of reality may identify conflicting realities as both true. Contradiction between memory panels' content is acceptable because the mind is comfortable with back and forth shifts of cathexes between telereceptor and haptic based memories, and between non-linear and linear organizations of data.

Shifts of cathexis between frontal and parietal areas is a fact of maturation for the attentional areas

of the brain. In early childhood there are paradigmatic maturational shifts between wholly narcissistic haptic memory traces and telereceptor traces with their potential for shared validation. In adulthood, mature cognition draws its strength from the identification of reality through comparison with verifiable telereceptor traces. In the creation of externally verifiable secondary elaborations, sensations are organized into communicative structures with fixed patterns, which fit prior established memory patterns stored in the frontal memory areas. The impact of the latter is diminished when attention cathexis (awareness) is shifted from temporal memory storage areas to transitional polymodal (auditory and visual and haptic) memory areas in the parietal lobe. These memory areas move into a position of dominance in defining truth, when they draw cathexis away from telereceptor influenced memory panels.

Panels of validating information can be called up for comparison in support of identification of the familiar as truth. Traces that are organized into memory panels may have origins in haptic traces and infused knowledge as well as in consensually validatable telereceptor sources. The finding of identities between inputs and memory panels in the frontal lobes is congruent with experiencing the quality of reality. The capacity to achieve direction of cathectic energies to frontal panels depends on physiological states. Should there be interference with frontally directed cathexes, as occurs in REM sleep, meditation, etc. (v.i.), *reflective functions* send cathexes toward the left parietal area where memory panels consisting of traces that are tuned to conform with simultaneous primary process cognition, permit greater latitude in the acceptance of infused inputs as imbued with a sense of reality.

THE LOCATION OF THE REFLECTIVE FUNCTIONS WHOSE CATHEXES GENERATE A SENSE OF REALITY

Ferenczi's "Capacity to Sense Reality", Aquinas' "Intellect" and Plato's "soul", are associated with the frontal limbic region. Solms (2000) has noted that the reflective systems associated with conscious sense of reality are lost in people with frontal limbic damage. "Patients, with damage in this region . . . lose the ability to distinguish between dreams and real experiences." (page 50) They suffer from ". . . a disturbance of reality-testing . . ." (page 50) which Luria (1973) attributed to "equalization of the excitability of traces." During which the panels that they contribute to become equal in their ability to attract attentional cathexes that imbue them with the sense of reality.

ON MEMORY PANELS

The existence of units of memory (panels) that can be used as referents for recognizing new sensory inputs is one of the oldest insights into human psychology. A reference may be found in Plato's (ant) "Phaedrus". Plato described knowledge based on prior experience as the basis for recognizing reality thusly, ". . . every human soul . . . has beheld true being . . . but it is not every soul that finds it easy to use its *present experience as a means of recollecting the world of reality."* (Page 56). Note that here that Plato's "world of reality" refers to memories based on experiences of goodness before birth not early infused content based on transcendent symbolism.

In 1907, Bekhterev linked the function of correlation of new inputs, with panels made up of traces of past experience, to the frontal lobe when he noted that animals without frontal lobes ". . . cannot correlate new external impressions with past experience . . ." This leads to ". . . loss of successive traces . . . failure to evaluate impressions . . ." and loss of ability to make deliberate choices. (pp 1464-1468, See also Luria 1977 II,5, p 222). Werner (1963) refers to this organization of traces through which the world is "known rather than merely reacted to . . ." (p 13) as a "symbolic vehicle" (p 15). Sperber (1975) referred to a search within memory for a "stock of acquired knowledge" (P117) from which can be constructed concepts by which new inputs can be recognized. He describes such a structure in memory as a "field". (p 121) He postulates the existence of a "conceptual mechanism" (p 141), which reconstructs fields, from "traces left by previous acts of construction" (p 141), which are used in the recognition of new inputs and remembered concepts. This concept has strong resemblance to "panels" evoked for use in evoking recognition for new perceptions and concepts. Gazzaniga, M. (1998) postulated an "interpreter" situated in the left hemisphere which ". . . assimilate(s) perceived information into a comprehensible whole." (p 26) The comprehensible whole that is produced, though less than accurate, becomes the basis for comparison of new external impressions with past experience. In this situation the "qualia" that is produced becomes a symbol imbedded in a panel to be used for comparison in evaluating reality. Comparison of new perceptions and interpretations with such prior infused or perceptually assimilated memory trace panels may produce a correlation. If this occurs, the basis for the experience of the illusion called a sense of reality is established.

Ninio (2001) in his scientific explication of illusions describes the sense of reality (". . . the one that

makes us believe that we have a direct hold on reality." p 181) as possibly the strongest illusion of all. His explanation of this illusion introduces the concept of "Criteria of judgment" (P 189), against which comparisons (p 184) are made in search for clues to correct actions and a stock (p 186) of words which are ready to surface to provide correlation of prior experience in the interpretation of new perceptions. His concept of a panel of memory traces is loaded in the direction of affects and social expectations. These shape behavioral responses. His panels of memory traces are not conceived of as fixed units persisting in memory. Rather they are awakened as associations to perceived cues. (". . . every stimulation from the outside awakens everything in memory related to it." (P 186) Traces are used for comparison in identifying the validity of a plan or perception. They are organized into panels as the result of dynamic interactive processing influenced by current situational and behavioral contexts. In Ninio's view, panels are actively organized from traces of prior experience at the time that new perceptions or concepts occur. It is possible within his theory for organized preexisting panels to be used for recognition of new inputs. Sense of reality contains an affect. Plato (ant) was the first to report the presence of a strong affect accompanying the recognition of a present experience as a simulacrum of the remembered world of "reality". He noted that people ". . . when they see some likeness of the world above, (preexperienced in the period of prelude to life) are beside themselves . . ." (p 56) The presence of such affects provides the sensation part of "sense" of reality. What is implied is the involvement of the hypothalamus the amygdala, and autonomic nervous system discharge in the production of the sense of reality experience that motivate responses such as hiding from a fearful hallucination.

LOCATION OF MEMORY PANELS

Bechara (1997) has reported the existence of memory panels in the ventromedial prefrontal cortex that are filled with traces of prior experience, which he describes as "records of previous individual experience". (Page 1294) These records form a basis for comparison in judging the validity of an input. These records must be retrievable to be useful as traces of past experience. Sense of reality requires an intact long-term memory, plus the short-term memory ability to move between short-term memory trace panels and long-term memory trace panels. Sense of reality cannot exist without an intact memory.

Bechara (1997) detected linear sequential serially related secondary process nonconscious mentation in the ventromedial prefrontal cortex experimentally. Normal participants and patients with

prefrontal damage associated with decision-making defects were given a gambling task during the performance of which behavioral, psychophysiological, and self-account measures were obtained in parallel. Normal subjects chose advantageously before they realized consciously which strategy worked best. ". . . prefrontal patients continued to choose disadvantageously even after they knew the correct strategy." (1293) "Moreover, normals began to generate anticipatory skin conductance responses whenever they pondered a choice that turned out to be risky . . . whereas patients [with damage to the ventromedial prefrontal cortex] never developed anticipatory [planning] . . ." (P 1293). Bechara (1997) saw this as ". . . evidence for a complex process of nonconscious signaling, which reflects access to records of previous individual experience specifically of records shaped by reward, punishment, and the emotional state that attends them." (p 1294)

OTHER MEMORY PANELS

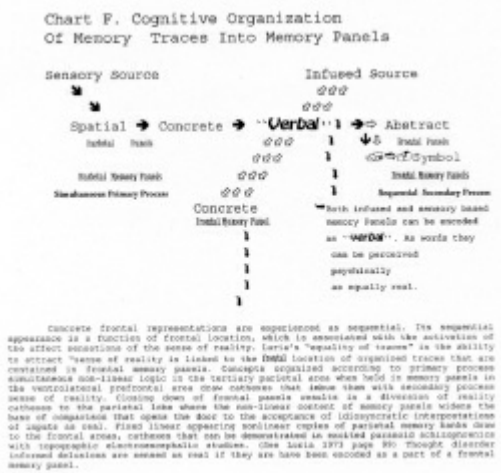
Luria (1973) described fixed linear appearing nonlinear memory panels with the primary process characteristics of "tertiary" parietal cognitive organization in the frontal areas of paranoid schizophrenics who were concentrating on their delusions as demonstrated by topographic EEG studies. (page 99) He also found memory panels in the left parietal lobe. People with left lateral parietal damage have no sense of reality. They have lost the sequential haptic memory panels whose use verifies reality. Sense of reality improves with memory return. The rule of thumb is that spontaneous improvement can be expected up to one year after injury. Luria (1973) has placed processing of concrete perception into verbal abstractions and memorization and storage of organized material in the tertiary zones of the posterior cortical regions (p 74). The location is in the left inferior parietal lobe. This storage location was identified by ablation studies and posttraumatic clinical findings. This parietal function contributes to the content of prefrontal memory panels.

Luria (1973) placed memory panels containing non-sequential nonlinear thinking without logical order in the left inferior parietal lobe of the brain. Solms (2000) in a paraphrase of Luria ("see Luria, 1966, 1973") differentiated the simultaneous nature of inferior parietal-lobe mechanisms from the sequential processes associated with frontal lobe memory patterns (p 46). Luria placed the synthesis that transforms traces encoded with primary process mechanisms into panels of traces encoded according to the principles of secondary process mechanisms in the tertiary multimodal zones of synthesis of the

parietal lobe. Luria (1973) noted that "This work of the tertiary zones of the posterior cortical regions is thus essential, not only for the successful integration of information reaching man through his visual system, but also for the *transition from direct, visually represented syntheses to the level of symbolic processes*—or operations with word meanings, with complex grammatical and logical structures, with systems of numbers and abstract relationships. It is because of this that the *tertiary zones of the posterior cortical region play an essential role in the conversion of concrete perception into abstract thinking,* which always proceeds in (sic) the form of *internal*schemes, and for the *memorizing of organized experience*or, in other words, not only for the reception and coding of information, but also for its storage." (Italics are Luria's.)(1973 p 74)

This process is not limited to the parietal lobe. The frontal lobe is involved in the final stages of the process too. Ablation and post trauma studies reveal a loss of relevant associations and serial connections in thinking with loss of frontal lobe function. Luria (1977) noted that "This facile lapse into irrelevant connections apparently lies at the root of the intellectual defects considered by many workers to be the specific feature of frontal lobe lesions." (Italics removed)(p 285)

Bechara (v.s.) has reported memory panels containing observed, organized experience, which are operational as templates for comparison of new inputs with prior experience in the ventromedial prefrontal area. (see Chart F)



MEDIATORS OF SHIFTS OF THE CATHEXES THAT CARRY THE SENSE OF REALITY

Shifts of the cathexes that imbue memory panels with conscious sense of reality are mediated by humeral, physiological, traumatic, and voluntary factors. Such shifts of the cathexes of the internal interpreter of the reflexive system, between frontal and parietal memory panels occurs on an ongoing basis. Solms (2000) has described one such example ". . . attentional cathexis is directed uncritically during dreaming towards the perceptual regions . . . Thus the process ends in a concrete perceptual representation, which is hypercathected by the reflective systems as if it were a real experience." (p 54) Note the similarity between these observations and the descriptions of St. Thomas Aquinas (v.s.) and the description of the "the reflective system" which Plato called the "Soul".

There are physiological reasons for shifts from telereceptor based (sequential verbally processed) prefrontal ventromedial memory panels to the haptic based (simultaneous visually processed) parietal memory panels, which are the sources of the symbols used for recalls during REM sleep. Acetylcholine dominance, which is a characteristic of REM sleep results in a chemically mediated alteration in cognition. There is exclusion of frontal memory panels as sources of representations during REM sleep (See Siegel (2000) p 78); Damasio 1999 p249 and Maquet 2000 p834). (Acetylcholine dominance

produced by the experimental infusion of physostigmine into the brain induces a shift in brain activation from the frontal to the parietal lobe. (Robbins (2000) **This frequent reversible physiological shift between serial and non-linear memory panels enhances the spectrum of tolerance of the intellect for the shift between haptic and telereceptor realities and reinforces tolerance for the two truths of the Western world.**

A shift in the cathexes of patients away from frontal lobe memory panels (associated with external organs of perception and stored in the ventromedial prefrontal cortex) also occurs when one is deprived of frontal lobe function as the result of trauma. Solms (2000) has noted in such cases a shift in the content of awareness away from abstract verbal entities to visually encoded memories that are stored in the parietal lobe. "Concrete, near-hallucinatory experiences" are produced (P. 204).

A reclining position introduces such a shift in preparation for sleep or free association. Meditation and mystic experiences are induced by active focusing of attention away from telereceptor sensations. (See Newberg 2001, Underhill 1955) Loss of retinal vision is often accompanied by shifts of cathexes to visual storage areas or visual traces. Hallucinations as in the Charles Bonnet syndrome frequently occur. (See Ramachandran 1998 p 87.)

The memory panels of the Ventromedial Prefrontal Cortex contain serially related, secondary process contents. The memory panels of the left inferior parietal lobe contain non-linear, spatially organized, primary process contents. The temporal lobes (see Ramachandran (1998 p 179) and Newberg (2001 pp 31-32) have been suggested as the local of memory panels for transcendent "realities".

The direction taken by cathexes during the search for an operative memory panel, is influenced by many factors. These include fatigue, humeral (acetylcholine) dominance as in REM sleep, mental illness, willful withdrawal of external attention cathexes from external reality, and states of sublimative creativity. As a result of the loss of availability of linear frontal lobe memory panel function, reality sense endowing cathexes are channeled toward non-linear contents in parietal panels. As a result sense of reality is attached to poorly organized primary process panels to produce, for instance, REM dreaming and Charles Bonnet Hallucinations.

DISCUSSION

Aristotle established a psychic reality system based on external phenomena perceived by the senses. This differed from the ancient cultural system based on the Platonic dualist concept of myth as reality. Aquinas identified the venue for the sense of psychic reality for both systems in internal mental interpretation. Contemporary studies recognize that experience perceived as psychic reality consists of interpretation of sensation based on comparison of new inputs to organized memory traces (panels).

As a result of a culturally accepted philosophy that makes possible assignment of sense of reality to internally generated sensations, psychic reality sense in our culture tolerates the perception of a wide spectrum of inputs as "reality". Inherent conscious contradictions between external sensation and input from within is tolerated because of persistent availability of the haptic cognition of the first year of life, when personalized early haptic events were the whole world and the shared and challenging sensations of sight and sound were barely developed. The contents of early haptic memory are endowed by boundary free narcissism with a sense of being real. This paradigm for an unchallenged sense of reality supports later influence of memory for distorted and symbolized experience as a criterion for the evaluation of new inputs as real. The shift to shared telereception as the source of validating memory begins with the development of sight and sound telereceptors. These become the source of a second bank for comparison in producing a sense of reality.

Neurophysiological studies offer anatomical locations for the circuits involved in the cognition that support the existence of shifts in the definition of reality. The circuit for the sense of reality consists of systems for reflection with an affect generator in the frontal limbic areas that responds to comparison of inputs to memory panels in the left parietal, prefrontal ventromedial, and temporal regions of the brain. The degree to which a faulty input can be recognized as real in spite of irrational characteristics depends on which location is the site of the memory panel that is cathected at the time, in the process of the scanning that will identify the new percept as familiar. In certain physiological states the memory panels of the frontal lobes are unavailable and reality endowing cathexes are routed to the memory panels of the parietal lobe or in the case of meditation to the temporal lobe.

The direction taken by cathexes during the search for an operative memory panel, is influenced by many factors. These include: humeral (acetylcholine dominance as in REM sleep), mental illness (as in

the acceptance of the reality of delusions in schizophrenia), willful withdrawal of external attention cathexes from external reality (as in states of sublimative creativity, and meditation), destruction of the frontal lobe (as occurs with trauma and brain tumor), and loss of telereceptor input (as in Charles Bonnet Hallucinations following loss of vision). With the described shifts of cathexes to memory panels in the parietal lobes, the sense of reality of frontal lobe syndrome patients attaches to the "a logical intellect" and "randomly found associations" [See Luria's (1973 II,5,p282) comments on Kleist (1934)] of the poorly organized primary process. The latter is presumed to be located in the "tertiary" area memory panels of the left parietal lobe. Tolerance for this condition in frontal lobe syndrome patients is supported by the persistence of the infantile cognitive organization. In normal development with the increasing impact of telereceptor influence on the synapses through which the content of parietal memory panels advance, the location transitions into the left frontal lobe. In this regard, the function of the right frontal lobe is little known. (see Luria 1973 II,5, p 293)

The ease with which the sense of reality can shift away from telereceptor reality underpins the dual reality of the Western world. For this reason, the world itself remains ever beyond human grasp. We are born into a drive dominated haptic fantasia. As adults we strive for shared telereceptor based realities. Because reality testing in adult life is frequently based on infused inputs, distorted interpretation, and symbolized telereceptor sensations, the best that we can hope to achieve is a psychic reality-based on symbolizations that are tuned to the world and vibrate in harmony with it.

SUMMARY

The elements of the brain infrastructure that make up the dynamic mosaic of distant points in the nervous system that are united in the task[13] of producing a "sense of reality" for the dual reality of the Western world are studied in this chapter.

"Sense of reality" drew attention first when the ancient definition of reality through mythological education was challenged by Aristotle who described reality as an external phenomena perceived by the senses. Aquinas later localized the sense of psychic reality to internal comparisons between new inputs and old memory banks. Philosophical tolerance for dual reality was created. Persistence of the cognition of the first year of life with its boundary free narcissism, combined with the maturation of sight and

sound, which added a verifiable second bank of panels for comparison in producing validation for detection of reality, supports this dual reality.

Trace panels for use in internal comparisons of new inputs to memory contents are contained in the left parietal, and prefrontal ventromedial regions of the brain. Cathexes from reality affect generating systems in the frontal limbic areas endow perceptions and inputs with the affect of "sense of reality". When the memory panels of the frontal lobes are unavailable, reality cathexes are routed to the memory panels of the parietal lobe. Secondary process contents are replaced by the primary process contents of the memory panels of the left inferior parietal lobe, making a dual reality possible.

NOTES

1 In primitive culture, individuals survived in personal encounters with the dangers of the hunt by a personalized approach to immediate dangers that could be seen and heard as well as through the manipulation of animistic symbols.

2 Hesburg (1994)

3 This material is derived from Kretzmann (1993) and from Zilboorg (1941) P 69 which is in turn a paraphrase of Nordenskiold, E (1926).

4 See Kretzmann (1993) P 70.

5 See Bourke (1960) ppxvi-xviii.

6 Boethius on the Trinity II, 3, c.

7 Adapted from Zimmer (1972)

8 See Silber (1934)

9 Adam Smith, David Hume, see Shott (1976) p 39.

10 Shakespeare 'Midsummer Night's Dream' iv 1 74.

11 Byron (1815)

12 Aquinas(1258)

13 This sentence is an adaptation of Pavlov as quoted by Luria 1973 part 1, (1993) P 70