the quantum field patterns or memories which the two aspects of the field process, acting in cooperation, have laid down in their overall tendency to facilitate the symmetry tendency of the normalizing process.

[43 The source of these structures is the asymmetrical structural "free energy" of catabolistic processes and their configurations are determined by the quantum organizations underlying the internal receptors.]

[44 According to Cannon's chemical theory of motivation it was postulated that hormones stimulated internal receptors open to the fluid matrix which in turn led to primary drives and emotions. However, a long series of experiments over the past twenty years has failed to bear out this hypothesis. That is, drive states have been obtained by the injection of hormones into the fluid matrix, but they have been of a crude and erratic sort and far from those that characterize human drives and emotions. In view of this, this writer suggests that that internal drives and emotions have the same causal mechanism as the external muscular tonic system. That is, internal muscular tonic changes (actually configurational normalizing distortions) due to tissue depletions (needs) result in the initiation of what subsequently becomes experienced as our internal affects. Hormones are secreted by the contracting cells (and not the other way around, as Cannon envisioned) into the fluid matrix. The hormones in turn stimulate special

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undergo rotational feedback with their respective complexing areas, the memory chains in these areas facilitate their own extension. 308

Under normal conditions, the functional resultants of both systems of muscular contractions cooperate, the one facilitating the other. The high asymmetry level and internal physiological development provided by patterns of internal muscular contractions provide the necessary physiological conditions and sub-systems for the operation of the external muscular system which the central semi-autonomous process controls and uses to improve—via locomotion and manipulation—the spatial relations of the organism with respect to the environment. The improved spatial relations between the organism and his environment tend to facilitate the normalizing process of the organism within its environment. An adaptive behavioral response is the resulting change in the relations of the organism to its environment; i.e., a response which facilitates the normalizing process of organism in environment.

In reference specifically to the experiential phenomena at this level of structuring, the experiential resultant of the structuring and spatially ordering process is sensory and affective ground. In humans, this "ground" phenomenon does not appear alone but appears in synchronization with the other two levels of structuring. Sensory ground apparently does not appear for all modalities at this level for the human. For example, visual ground seems to be mediated by the cortical areas, but for the majority of modalities, the tropistic structuring level seems to serve this purpose.

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drive-reducing centers such as the food and thirst centers in the hypothalamus. Moreover, removal of peripheral tissue (for example, the stomach wall), for the purpose of removing the primary drive would not eradicate the hunger driver drive per se because the complexing (memory) areas mediating this drive in the central memory area (located perhaps in the anterior frontal and hypothalamic areas) and other memory areas have not also been removed. Thus, physiological drives are postulated to be due to changes in the tonicity of internal muscle receptors which in turn result in the production of macro-mosaic stimuli. These are then dispersed and then converged, structured into aggregates, coupled onto asymmetry chains and experienced, etc. In this way, the momentary variations in these internal sub-systems (called momentary variations in affective states) are experienced and, by their

interactive effects on the asymmetry chain, affect the perceptual processes of the human. Tonic effects on perception from the external muscular system have been demonstrated by the sensory-tonic experimenters. These effects are of interest in themselves but also because they demonstrate the interactive effects between quantum structural aggregates on the asymmetry chain as can be seen by the shifting of visually perceived lines to one side of the chain or perceptual field by changes in tonic stimulation. The "dynamic process" which the sensory-tonic theorist hypothesizes is here postulated to be the reticular structuring centers and the sensory-tonic "elements" are postulated to be the quantum structural aggregates.]

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2. THE SECOND OR PERCEPTUAL LEVEL

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The third route of the asymmetry chains coupled with structural aggregates (from the central structuring center at the tropistic level) is to complexing areas of each modality on the next level of structuring. This route from tropistic structuring centers is conceived to be along the specific afferent projection fiber tracts of each sensory modality to the cortex. However, rather than serving as projection tracts, the projections system is conceived instead to serve the same function as the geniculate bodies, that of spatial dispersal, the dispersal being that of the structural aggregates emerging from the central quantum organizations at the tropistic level. The dispersed segments are probably not specific quantum structures as on the tropistic level but larger parts of the structural aggregate. Thus, the terminus areas of specific projection fibers (striate area for the visual modality) are conceived to be the first complexing level for these partial quantum aggregates.[45]

Before reaching centers of symmetrization, the dispersed quantum aggregates pass through two levels of complexing memory quantum patterns. On the first level there seem to be short chains of quantum patterns (memories); on the next level there seem to be longer, more complex sequences of such quantum memory organizations. (The second level would be, for example, the parastriate area for the visual modality.) [46] The incoming partial quantum aggregates decouple longer similar links of these quantum memory structural organizations and sweep these to specific spatial symmetrization (structuring) centers.

The second level of structuring is conceived to lie within the reticular formations in the higher brain stem, that area which Penfield

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[[45] The projection areas for the exteroceptors and some interoceptors have long been known. About twenty years ago, the anatomist Le Gros Clark found the anterior-frontal area to be a projection area for the hypothalamus. In view of this, the anterior-frontal area is regarded as the complexing areas for the internal affects, in other words, memory areas for the specific food hungers, emotions, and feelings. It is within these areas that structural aggregates, whose intrinsic structural changes lead to our affective experiences, are recorded.]

[[46] The striate and parastriate areas may be poor examples to illustrate the nature of memory levels on the perceptual level of structuring for visual ground phenomena seem to be mediated on this level rather than on the tropistic level. Stimuli are known to go first to the striate visual area, then back to the reticular centers, then to parastriate visual areas, then back again to the reticular centers (Jasper). The striate areas may be serving the "ground" or tropistic function and the parastriate areas may serve the "figure" or perceptual function. Perhaps this is the significance of primary and secondary areas for other modalities—that is,

the evolutionary corticalization of the "ground" function so that both "figure" and "ground" are mediated cortically.]

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calls the centrencephalic system—a system known to be bilaterally 310
connected with both cerebral hemispheres and which serves to coordinate their activity. Many relatively similar partial links of decoupled quantum memory organizations must be brought to this structuring center by the dispersed (tropistic) quantum aggregates but, because of the discrete coupling nature of the underlying quantum organizations, only one of these partial links can enter and, hence, undergo spatial structuring at any one moment. The first such link to reach the structuring center under normal conditions is apparently determined by the hierarchical status of the particular incoming internal and external stimulus within the quantum memory hierarchy in a particular memory area.

Spatial symmetrization of the stimuli of each sensory modality occurs in the specific quantum organizations sub-served by the reticular centrencephalic system. This structuring of the aggregate parts, due to the formative aspect of quantum structured fields in isolable processes, provides the "figural" properties of our internal and external perceptions.

After the product of each sensory modality has been individually spatially symmetrized, each feeds into a central quantum organization also sub-served by the centrencephalic system. At the moments of coupling with the normalizing-respiratory asymmetry chains, serial order is effected within each specific modality and interrelationships effected between the structural aggregates of the various modalities. It is at these moments that we experience the "figural" and dimensional (intensity variables) properties of combined internal and external perception. Thus, the results of this continuous but constantly varying structuring process are the figure phenomena of our perceptions with all their qualities, intensities, and momentary variations. The psychological phenomena that we experience, however, are due to moment to moment variations in the structures being symmetrized in the underlying quantum structural organizations; psychological phenomena, as pointed out above, do not cause underlying structural changes but are themselves always the resultants of such structural changes. The central structuring center producing "ground" and the structuring center producing "figure" are kept in step or are paced by the normalizing-respiratory process, their synchronized function yielding the combined internal-external figure-ground phenomena of our perception.[47]

[[47] One might wonder about the significance of the various levels of symmetrization which are postulated to yield our perceptual and conceptual-symbolic processes in synchronization with one another. A clue might be had by analogy to the molecular organizations that serve as

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After spatial (temporal) ordering and simultaneous psychological 311
manifestations, these aggregate-carrying chains are also spontaneously dispatched from the central quantum organizations along at least three separate paths. One of these is the rotational (feedback) path to the complexing (memory) areas of each specific modality on this (perceptual-level of structuring. A second path is to complexing (motor memory)

areas. A third path is to complexing areas of each specific modality on the next level of structuring.

Referring specifically to the first path—the first level of memory formation occurs in the terminus areas of the specific projection tracts. Within this first memory level, the qualitatively specialized phylogenetic quantum memory chains (that is, sequences of quantum structural patterns already present in the organism and which appear after the completion of maturation) seem to be relatively fixed; that is, they undergo little ontogenetic extension during the individual's lifetime. Within the second memory level there appears to be a great number of qualitatively specialized phylogenetic chains capable of greater ontogenetic extension than the comparable chains at all lower levels.

The various qualitatively specialized chains of quantum patterns of the first level, when decoupled and allowed to approach their intrinsic structural symmetries in the structuring centers, are experienced as the specific sensory qualities such as colors (hues), ranges in pitch (tone), odors, tastes, pains, temperature sensitivities, and tactile impressions related to our exteroceptive system and the aspects of internal affects related to our interoceptive system: emotions, hungers (of which there appears to be many types) etc., and kinesthetic impressions. The quality ranges such as

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catabolistic processes. The first molecular organization to be evolved was a very inefficient means of catabolism. Superimposed upon this molecular organization was a more highly organized and efficient means of catabolism. The former less complex molecular organization was not used anymore but it could be so used when the latter was inoperative. The next complex organization is superimposed upon the last, the property or function of the last one to be developed is used for optimum efficiency; that is, each level is more organized and efficient than the last.

Thus, the most complex and efficient means of catabolism is the one that is dominant and in continuous operation and, if the dominant structural organization is impaired or destroyed, the next less complex catabolistic process—one step removed in organizational complexity and efficiency—comes into operation. Apparently, the three levels of symmetrization have somewhat the same significance (with the exception that all three levels are in synchronized operation). The highest level (conceptual-symbolic) is most compexly organized, dominant, in continuous operation, and provides the most efficient psychological and behavioral activity and flexible adaptation to the environment.]

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the color spectrum (400-800 mμ) [Ed.: 400-800 nanometers], the range of 312
pitches (20-20,000 c.p.s.), the nine-fold odor qualities, the four basic taste qualities, etc., are postulated to be ranges of adjustive-disruptive normalizing distortion phylogenetically built into the modality sub-systems. Intensity variables such as the loudness of a sound and brightness of a color are postulated to be measures of current normalizing distortions being produced in the system by the stimulations of the movement. These intensity variables have fairly fixed points (adjustive and disruptive normalizing distortion) but also can vary with the momentary degree of normalizing distortion present in the sub-systems (modality) and display the property known as adaptation in the field of sensory processes.

The second level is conceived to yield longer, more complex sequences of quantum structural patterns than the first level, and when decoupled and

allowed to approach their intrinsic structural symmetries in the structuring centers, are experienced as the highly articulated aspects of our visual, auditory, tactile, kinesthetic, etc. perceptions. (These sequences of structural patterns on the second level are partially obtained from the structural contributions from the first level to the incoming stimuli and partially obtained from the quantum structures of the incoming stimuli themselves with the sequences being formed in the structuring centers.) The formation of these sequences of specific quantum patterns (or sequences of specific configurational qualities yielded by these quantum patterns) during the lifetime of the organism is called perceptual learning and the resultant of the formation of these sequences yield what is called perceptual meaning. Meaning for visual perception is objects, situations, and events in space; for auditory perception—words, melodies; for tactile perception—percepts of hardness, softness, roughness, smoothness, etc.; for the affects and primary drives—finer aspects of emotions,[48] appetites, etc. and for motor perception –finer kinesthetic impressions, etc. If the memories on this second level of perceptual memory are either structurally or functionally impaired (the latter ----------

[[48] At birth, the infant has one emotion: general excitement. Shortly thereafter, the three basic emotions: fear, anger and love or pleasure start to maturate. When maturation is complete, finer aspects of emotion begin to develop due to learning experiences. At the age of 4 or 5, a new hierarchy of affective experience starts to develop called feelings. These are also developed via the learning process and continue developing, perhaps, throughout the lifetime of the adult. These affects are closely related to value experiences; i.e., learned social and cultural goals. Perhaps we can ascribe "general excitement" to the tropistic level; anger, fear and pleasure to the first perceptual level; the finer aspects of these basic emotions to the second perceptual memory level; and the feelings would be ascribed to the three memory levels of the cognitive processes. Anxiety seems to be a complex of emotions and drives, having pain and fear aspects.]
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by failure of the asymmetry induction process), the various types of agnosias 313
appear which refer to a loss of memory for the meaning of (and hence, loss of the ability to recognize the use of) objects.

Instincts are complex meanings already in the organism on this level. That is, instincts are sequences of quantum structural patterns containing exteroceptive, interoceptive, proprioceptive and tonic components of a relatively high degree of organized complexity coordinated into one composite memory chain already in the organism, that can be decoupled by incoming stimuli as soon as maturation is complete. (The extent to which such "instincts" exist in the human organism is the special task of ethology to discover. It seems that many such instincts exist in the human but are obscured, colored, and controlled by our cognitive processes. Instincts are not to be conceived as uncontrollable calls to action but as less complex and less variable forms of activity which have been largely superceded by more complex, efficient, and more flexible forms of activity. Moreover, according to Tinbergen, there is no aggressive or fighting instinct per se in either animals or man. Fighting patterns are present, however, but are closely linked to other activities such as sexual activity. There are, on the other hand, many fairly well known cooperative instincts. The human would do well to accept his instincts—especially his sexual instincts—and use them to enrich his cognitive life rather than suppress and distort them with the distortions showing up as neurotic and psychotic symptoms.) The intensity

variables on this particular level yield us our shifting criteria of hardness, brightness, loudness, etc., related to some specific event or object. That is, this is why we consider some objects as heavy and others light; some objects as bright and others dull, etc., and why the same object may be considered as heavy at one moment and light the next moment. This shifting frame of reference on the perceptual level is given by the shifts in normalizing distortion at this particular level. This will be more fully explained below in the footnote on adaptation level. The sensory-drive and perceptual-emotional levels compare to the level of cognitive processes are fast acting (fast structuring) and are the levels of "reflexive" and "instinctive" behavior for the human.

The incoming partial quantum aggregates pass through all quantum patterns on either or both levels (decoupling only similar structures) so that each sensory quality and perception experienced is a generalization of past phylogenetic and ontogenetic memories recorded in these areas. Thus, each structural aggregate formed is built up by the structural contributions from all similar memories in the memory areas. Hence, an experience, sensation, percept, or concept is a function of all similar quantum structural patterns already present in the memory areas. This is the significance of the term transaction—what is already in the memory sub-system contributes to what comes in (differentiating the stimulus in the process) while the transacted or complex stimulus itself serves to develop further the sub-system since it, as a symmetrized structural aggregate, subsequently becomes a part, via memory formation, of the same sub-system that just differentiated it. The implication is that we literally must learn to perceive (see, hear, smell, etc.) and do so by the ontogenetic formation of these sequences of quantum patterns on the second memory-perceptual level in the very early years of our lives. Thus, the structural aggregates on this second level, when arranged in a certain order and recorded as memories, yield the objects, events, and situations of our visual perceptions. (The arranging of the structural aggregates into serial order in effect arranges their configurational properties into a certain order.) And similarly the structural aggregates that yield sounds (pitches), when arranged in a certain order yield words, melodies, etc. Thus, the perceptual meaning that appears is the resultant of the ongoing events in the structuring centers (the formation and ordering of structural aggregates) and is recorded on the second complexing or perceptual level via memory formation.

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Primitive figure-ground phenomena are apparently present from birth (as we would expect since figure-ground is due to an intrinsic mechanism) but object or situational meaning and aspects of orientation come about by learning. This progressive differentiation of the memory areas provides the means to discriminate and generalize incoming stimuli. The phenomenon of perceptual constancy, for example, seems to be a resultant of this increasing differentiation and it is a good example of the organism-in-environment stability promoted by the normalizing process. As the memory areas become more and more differentiated we have more and more "clues" from the environment decoupling similar memories. These structural transactions recombine to give us a more veridical representation of objects and situations in our environment despite a certain amount of instability in our

distal perceptual-environment.[49] Perceptual constancies may be due to both

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[49 The fact that humans must take the whole context of events into consideration to make a proper adjustment especially under unstable conditions is well illustrated by perceptual constancy. When the entire stimulus manifold is available to the adult, we experience our perceptual world much as we could go out and touch it (empirically examine it), but when the manifold is reduced (Boring and Holway) or the context is reduced, we have a harder and harder time trying to determine perceptually what is "out there."]

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phylogenetic and ontogenetic differentiation of the memory areas and they also seem to be mediated by the attention process called "set." 315

Referring specifically to the second path of structural aggregates emanating from the perceptual structuring center, the continuously moving aggregate-carrying asymmetry chains pass into complexing motor memory centers. The complexing motor areas for the externally oriented muscles seem to be the motor and pre-motor areas in the pre-central region of the frontal lobes. The comparable complexing motor centers for the internally oriented muscles seem to be in the anterior and side-wall (Rolandic fissure) portions of the same cortical lobes; projections from the hypothalamus arrive in these areas and projections *from* these areas pass to lower hypothalamic and other areas. There are also probably two complexing levels within each motor system. The first level seems to yield relatively specific stereotyped sequences of muscular contractions; the second level yields sequences of specific type of muscular contractions which, however, are acquired via memory formation and "motor" learning during the lifetime of the individual.

Thus, internal and external motor memory chains are decoupled by similar incoming dispersed stimuli. (If no stimuli are active and, hence, none coupled onto the asymmetry chain and dispersed, of course, the motor memory chains are not decoupled and muscular movement does not occur.) The complexed chains then pass to the hypothalamus and other central centers that control these internal and external muscular contractions. The external sequences of muscular contractions of this level manifest themselves in the many and varied relatively stereotyped kinds of bodily movements, locomotion and manipulation—other than the highly flexible and refined skilled motor movements (such as those of speech) which also often involve the mediation of the attention process. The internal sequences of muscular contractions manifest themselves in more specific and directed spatial and temporal secretions of hormones into the fluid matrix which permits a more precise control of internal development.

The sequences of external muscular contractions, again under control of the central semi-autonomous process, serve to order progressively the spatial relations of the external environment with respect to the organized nature of the memories on this level and, in the long run, with respect to the one-way directional tendency of the normalizing-respiratory process. The spatially and temporally controlled secretions of hormones into the fluid matrix serve to develop progressively and control the internal processes also in respect to the memories in the internal memory areas (anterior frontal) on this level and with respect to the symmetry tendency of the normalizing process. 316

The functional activity of specific external and internal muscles results in the initiation of stimuli, that is, stimuli coming from both smooth and striated muscles. These internal and external motor stimuli, in the form of quantum structures, pass on to specific and the to central quantum organizations within the centrencephalic system and undergo spatial ordering. These motor structural aggregates, now in a configurational and spatially (temporally) ordered form, enter the other internal and external modalities during the latter's to and fro feed-back activity.

The configurational structural changes in the structural aggregates from externally oriented (striated) muscles are experienced as kinesthetic perceptions of specific muscular movements. The configurational structural changes in the structural aggregates from the internally oriented (smooth) muscles of organs and glands are experienced as the finer aspects of emotions and primary drives. These configurational experiences—emotions, tastes, appetites, etc.—together with their variations in degree and quality, are the figure of figure-ground affective internal perception and appear temporally contiguous with exteroceptive perception.

The internal and external motor structural aggregates, after central symmetrization, also undergo feedback with their respective complexing areas (anterior and posterior frontal), the memory chains on these levels facilitating their own extension. It is these quantum chain extensions and differentiations (of the second level) that are responsible for future specific sequences of internal and external muscular contractions, called muscular coordination, or patterns of muscular contractions. The result of the one-way process of development (selective elimination of distortion-producing quantum memory organizations) manifests itself in the more and more organized and ordered chains of muscular contractions of locomotion and manipulation. The resultant of the same process in reference to the internal system of muscular contractions is a more specific secretion of hormones into the fluid matrix.[50]

[[50] That is, the overall resultant of this rotational activity is the progressive extension and differentiation of memory structural organization of similar types of configurational structural patterns. These extended and differentiated sequences of similar types of quantum memory organizations, decoupled by future stimuli, manifest themselves in more specific (in relation to external situations) locomotory and manipulatory activity. The internal functional resultant is a more specific spatial and temporal sequence of secretion of hormones via activation of the autonomic system that more precisely controls the anabolistic and catabolistic processes which use the fluid matrix as a channel of communication.]

Before we leave this discussion of the perceptual level, we will briefly 317
discuss the transactional movement at Princeton University and its important implications for unitary theory. In their experiments and demonstrations, the transactionalists utilize the well-known hierarchy of cues; for example, in space perception there are certain cues that enable us to gauge aspects of space-size-distance relationships of our perceptual experiences. These cues have weighted value in resolving spatial relations so that they can be arranged in a certain order of their importance. In fact, this hierarchy of cues can be used to illustrate the highly dynamic, flexible, and creative nature of the structuring process that underlies and which yields our

perceptual and symbolic-conceptual phenomena. The example cited here will make use of a perceptual situation (one of the Ames' demonstrations) containing a cue of known dominance—in this case the cue of perspective. If the projections of the shadows cast by an actual window due to an overhead light are painted on both sides of a rotating trapezoidal cutout so that the actually further edge of the window is made to appear nearer to an observer (thus reversing the perspective as it would appear in a natural setting) and observed with one eye by a subject with normal vision, the trapezoidal cutout will be seen as an oscillating rectangular window (instead of the empirical circularly moving trapezoidal window). If a rod made of wood is attached to the rotating trapezoidal window, the rod will be seen as either cutting through or wrapping itself around the window, depending upon whether the subject assumes the rod to be wooden or rubber, and moving in an opposite direction to the window whereon it is rigidly attached. If a cube is fastened to the window, it will be seen to detach itself momentarily from the window and float freely in space and describe a full circle while the window is still seen oscillating in half circles. All of the illusion can be seen to take place at once in a dramatic demonstration forming a novel perception, completely foreign to our past experiences. Apparently, certain perceptual memories called "assumptions" are elicited by the reversed dominant perspective cue (the only aspect in the controlled situation varied) and structuring proceeds in terms of these perceptual memory patterns or "assumptions." That is, perception occurs in accordance with the unveridical assumptions elicited. (In this case the unveridical assumption elicited by the demonstration with the reversed perspective due is that the rotating trapezoidal cutout is a *normal rectangular window seen in normal perspective.* What we see then—an oscillating *rectangular* window, a wooden rod cutting through or wrapping itself around the *rectangular* window, etc.—is determined by, or accords with, this unveridical assumption.) The novel perception (i.e., we do not see wooden rods bending like a rubber hose, nor cubes floating 318
unsupported in space in ordinary visual perception) demonstrates both the transactional nature of our perceptual process and the truly creative nature of the structuring process. (That is, we do not see exactly what is out there but we see a combination of what is out there and what is contributed by our perceptual memory organizations.) In this case new properties appear; in the case of the illusion or our perception of the demonstration, a completely novel perception appears. These demonstrations are used by transactional theorists (Cantril, Kilpatrick, Ittleson, etc.) to point out that the presence and nature of the assumptions based on past experiences made by observers regarding the probable characteristics of the objects and situations they are viewing.[51] In this way we can discover the part played by the subject's purposes, values, etc. in perceiving a particular situation.

The transactionalists suggest that by changing the assumptions (contributing to our perceptions) through action we can overcome the unveridicality of our behavior based on such unveridical perceptions. The directive state theorists hold to an analogous viewpoint that human values and personality characteristics strongly influence what we perceive. In the opinion of this writer, the cognitive processes do have a controlling influence over the perceptual processes since they seem to be the dominant process in the psychological hierarchy. However, this control is not thought

to be of such a nature that the higher processes determine in large measure what we perceive as seemingly implied in the literature. (For example, despite full knowledge of the nature of some of the Ames demonstrations, we still cannot perceive them as they are; that is, we still perceive the novel perception despite the change in cognitive attitude.) As Allport has pointed out, most perceptions are veridical—that is, there are very few perceptual situations in our everyday experiences that elicit unveridical assumptions which cause us to perceive unveridically. By far and large the "assumptions"

[[51] Cantril has shown in an interesting series of articles and books how the above implications can be put to work in devising a scientific basis for human ethics and human values. Those actions that promote the development of the individual in the social environment are "good" and other actions "bad." This viewpoint on human ethics and values aims at the goal of mutual development stressed throughout this work. This writer is indebted to both social psychology and Cantril, for many of the viewpoints expressed throughout this work. This writer, however, would put an emphasis on social-cognition rather than on social perception in social psychology, value theory, etc. The phenomena of the perceptual level are relatively fixed including the perceptual assumptions while, on the other hand, social conceptions can be, and are, rapidly changed via learning.]

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elicited by cues are in accordance with what is out there in the external 319
environment. Allport and others suggest that the influence of the cognitive processes over the perceptual process is exerted through the process of attention called "set." "Set" implies the induction of a patterned (this is the writer's viewpoint to be expanded below) asymmetry into the perceptual memory areas which act as a selector of what the human reacts to and perceives. That is, we all tend to perceive veridically but we may select different aspects and, hence, vivify the selected aspects and slight the other aspects of our perceptions. (For example, an empirically distorted room may initially appear as a normal room to an observer. However, if the subject observes a bouncing ball in this room, the room gradually appears distorted as it is empirically. The alteration is due to changes in the way we look about the room which cause us to pay more attention to certain aspects we may have slighted before.) The vivifying of these aspects and not a change in the perceptual assumptions gradually results in the veridical perception. In this way, cognitive factors such as attitudes, motives, and beliefs may influence perceptions through set, but in most cases our perceptions are veridical—it is a phenomenal world that most humans have in common with each other along with small variations due to individual differences in set and possibly past perceptual learning.

We should not, however, lose sight of the important contributions of the transactionalists to psychology in general and also to sociology. Perhaps the salient point illustrated by the transactional demonstrations is the dominance of the cognitive processes over the processes and sub-systems such as perception lower in the organizational hierarchy in the human's nervous system. (Actually, if we think for a moment—the psychosomatic and hysterical symptoms of neurosis and hypnosis illustrate the same thing.) The transactionalists point out that if we base our behavior on such novel perceptions or illusions as illustrated in the above demonstrations, we would have chaos for behavior and the empirical situations would not correspond. But luckily such perceptual illusions in everyday living are rare, "assumptions" are hard to change, and there is a fairly good representation

of the environment in our perceptions. The point is that we often base our actions on illusions—but the illusions are cognitive. It might as well be said that we live in an age of highly organized cognitive chaos and confusion because our thoughts and actions are often based on highly unveridical social-cultural concepts. (Science is an exception, but when the scientist bases his actions outside of his field on religious or philosophical cognitive systems, he is no better off than the rest. However, it is a fact that the 320
individual men and women of our time—even in the lower educational groups—are far superior and far more sophisticated that the somewhat child-like unveridical socio-cultural cognitive systems that are supposed to set the norms and values that guide and direct their behavior.) [52] As we mature and perceptual and cognitive learning take place, our behavior becomes more veridical, that is, more in correspondence with empirical situations; this is the basis of the human adaptation process. Perception and cognition—the latter the most complex and hence the dominant process—are actually two phases of the same continuous process bringing the organism and environment into conformance. The unitary tendency is a formative process of decreasing asymmetry which in this case means an increase in correspondence between the perceptual-symbolic-conceptual structural organization of the organism and the structural organizations and events of the environment. Only when our perceptual-conceptual organizations have a one-to-one correspondence with their empirical referents—which is the meaning of veridicality—do we have valid relationships and valid knowledge and only then can our behavior realistically correspond and hence, realistically develop and direct our environment. This intrinsic movement toward veridicality, moreover, demonstrates the unitary and structural principle that the organism-in-environment is one system and that the structural organizations in the organism must conform to what is in the empirical environment. This is the healthy situation; other situations—except those in the arts and in hypothesizing in ordinary life and in science—are abnormal cognitive relationships.

The third level processes, the cognitive processes, enable the human to differentiate what he experiences on the second or perceptual level, that is, he is able, via his cognitive experiences (and extrapolations of these), to find out more and more what his perceptual experiences signify. Discrimination and the human's knowledge of reality depend upon these cognitive meanings. The discriminations of the human are derived due to the processes employed by the third level—going down to empirical referents and the providing of veridicality or conformance between conceptual-symbol and empirical referents. An increase in conformance between our concepts and empirical referents, moreover, enables us to discriminate perceptually to greater degrees.

[52 This signifies, for example, that if a view of society and culture is set forth by science, it will be very rapidly accepted by the American, European, and other peoples of the world. And by this shift of emphasis, the norms and values espoused by unhealthy religious and philosophical systems will be thereby rejected.]

The above implies that reality cannot be perceived in its entirety but 321
it can be known by the successive refinements of our concepts. With this refined veridical knowledge we can direct our perceptual processes or extra-corporeal extrapolations of these to "look for" what is out there. This is essentially what scientific method provides for us. That is, scientific method is not necessarily something the scientist does but scientific method is the human's cognitive processes extrapolated and at their best. Our concepts approach denotability. Our understanding of things as they *are* and not only as they appear is accomplished by a constant system of checking by all means on hand—corporeal and extra-corporeal such as with the aid of scientific equipment—to see if out concepts are really veridical or illusionary as in the perceptual demonstrations above. The cognitive processes, extended and supplemented by scientific method, are thus the human's road to valid knowledge and the road to understanding and adjustment. Such understanding, moreover, enables humans as individuals or social groups to take the smaller and larger context of events in hand and to relate the two.

3. THE THIRD OR COGNITIVE LEVEL [53]

The third route of the aggregate-coupled asymmetry chains emerging from the perceptual level of structuring within the centrencephalic system is to the complexing areas of the next level of structuring. One such complexing area, possibly for audition, has been recently discovered by Penfield within the temporal lobe.[54]

[53 This writer would postulate that all animals below mammals lack this third level of structuring. The phylogenetic emergence of this third level (some 200 million years ago) enabled the mammals to interpret and respond to their perceptions in terms of more discriminable conceptual processes which, in the human, have become conceptual-symbolic processes. The concepts, of course, include affective and motor components. Moreover, along with the third level of structuring came the possibility (through set) of more and more discriminative perceptual and motor processes which permitted a greater knowledge and ordering of the internal and external environments via a greater specificity of response to them. In reference to the human, the cognitive processes of the third cognitive-memory level (which began to appear only some 200,000-500,000 years ago, and hence are exclusive to man) enable him to interpret his perceived environment in terms of long complex patterns of quantum field which are manifested in the conceptual-symbolic language processes which, in turn, enable him to react discriminately and deliberately or swiftly to his environment as the occasion may demand. The slow, deliberate, highly discriminative conceptual-symbolic processes enable man to control his environment and to be the arbiter of his own fate.

54 Penfield, however, seems to regard this memory center within the temporal lobe as a central center for the recording of all specific past experiences rather than as a single center involving only one modality, in this case, audition. It was stated above that quantum memory chains are conceived to contain one central structural chain with as many subsidiary chains of other modalities as were activated at the time the central chain was recorded. Penfield's temporal memory areas seem to be of such a sort rather than a central center for all specific past

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The route from the second level of structuring to the third level complexing 322
area is probably along the projection fibers such as those that project to Penfield's temporal memory areas. Thus, the dispersal means at this level seems likewise to be the projection fibers such as those which project to the

above temporal memory areas. The dispersed segments must, however, be more complex than the dispersed partial aggregates of the second level of symmetrization.

The dispersed partial aggregates, before reaching the highest level of symmetrization, pass through either one or all three of three possible levels of complexing memory areas. On the first level there are conceived to be specific sequences of quantum memory organizations that mediate specific total past experiences such as Penfield has discovered; on the next level there are longer, more complex sequences of quantum memory organizations, each specific sequence forming what is manifested as a concept; on the third level, the longest and most complex specific sequences of quantum memory organizations appear, each of which mediates some complex personality attribute. The specific sequences on all levels are, however, interrelated via configurational structural similarities. This interrelationship provides the highly organized attributes of the human's cognitive processes and their resultant—the human personality.

The incoming partial aggregates decouple long similar links in these quantum memory areas and sweep these to specific spatial structuring centers.[55] After structuring has occurred the aggregates are fed into the central

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memories. In other words, each modality should contain memory areas such as Penfield has discovered in the temporal lobe. This multiplicity of memory areas—each one containing besides its own memories, the memories of other modalities as well—might help to explain Lashley's mass action data which is the obverse or highly specific localization of psychological processes such as is implied in this development. Specific areas of the brain (other than those well known to be) may very well be highly specialized to record and participate in processes involving specific types of stimuli but, because of the multiplicity of specific memory areas, removing one specific area still leaves the memories of this specific area as subsidiary memory chains in other areas. It is furthermore postulated that if the first of the three complexing levels on this third level of structuring is impaired (structurally or through failure of the asymmetry-respiratory induction process) aphasia appears. The term "aphasia" refers to a loss of, or impairment in, language functions such as labeling and naming of objects and situations. This also includes loss of arithmetic and mathematical words and names.

[55] The third or cognitive level is postulated to be also in the centrencephalic-reticular system. Thus at the lowest or caudal end of this reticular system lie the cognitive structuring centers; at the upper or cephalic end lies the tropistic structuring center, and in between lies the perceptual center. Perhaps a fourth structuring center exists within the anterior-frontal area. If such exists it is the highest symmetrization center. The above development is based on the assumption that only three such levels exist.]

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quantum organizations at this structuring level. At these brief moments of 323
structuring and coupling with the normalizing-respiratory chains, psychological phenomena characteristic of this particular complexing level are manifested. It is at these moments that we experience various aspects of the cognitive processes, depending upon what particular complexing level is involved at the moment. Thus, symmetrization in this highest structuring center provides the various psychological aspects of our symbolic-conceptual or cognitive processes with all their articulation.[56] The central structuring centers producing ground, perceptual figure, and the various

aspects of symbolic-conceptual processes, when synchronized by the pacing process, yield our unitary perceptual-symbolic-conceptual psychological phenomena.

After structuring and spatial (temporal) ordering and simultaneous psychological manifestations, these aggregate-carrying chains are spontaneously dispatched from the central quantum organizations along at least three separate paths. One of these is the feedback path to the complexing areas of each specific modality on this level of symmetrization. The second path is to complexing (motor memory) areas of internal and external muscular systems. The third route, since there are no longer any higher complexing areas and symmetrization centers, is postulated to be continuously feeding back into the three complexing levels and back to the specific and central symmetrization center. This continuous feedback and continuous activation of the highest structuring center is the source of the human's central semi-autonomous-symbolic-conceptual process which appears above threshold as human thinking and above and below threshold as

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[[56] The source of the configurational or articulated aspects of our cognitive processes is in the incoming aggregate-coupled asymmetry chains from the perceptual levels, the sequences of complexing memories with which these partial aggregates transact, and the structural aggregates produced within the structuring center in the highest (functional) level of the centrencephalic system. It will be recalled that on the second level of symmetrization, sequences of quantum memory organizations yield percepts such as objects, events and situations in space in our visual perception. On this third level of symmetrization, sequences of quantum memory organizations yield our symbolic-conceptual ideas, attitudes, assumptions, values, past experiences, etc. in our thinking. The meaningful aspects of these cognitive products are due to the interrelated sequences of underlying structural organizations. That is, meaning is based on the formation and elicitation of complex sequences of these quantum memory organizations. An important point to realize is that new meaning can result from the re-arrangement of the structural aggregates comprising the quantum memory organizations. These symbolic-conceptual meanings however may be related to the environment or may be completely unrelated to the environment as is the case of the completely unveridical perceptions in the transactional demonstrations.]

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a continual organizational and ordering process. (Empirically the semi- 324
autonomous process is the normalizing process, in the form of the highly vibrating asymmetry chain, at its highest level.) It is the process involved in human symbolic-conceptual learning, creative human thinking, the motivation of most human behavior, the development of complex organizations called personality attributes, etc. This will be expanded below.

In reference to the first path of the aggregate-carrying chains dispatched from the central cognitive center, there appear to be three levels of complexing at this highest level of structuring. Within the first complexing level, each specific composite memory pattern seems to contain the complete record of specific past experiences, without generalization, and seems to be delimited only by the span of the attention process operative during the time the specific past experience was recorded.

> . . . recollection is presented to consciousness. But the record is not that of the event alone. With it is stored a record of the substance of the individual's thinking concerning the experience and the attendant emotion that may have accompanied it. The neuronal mechanism which we have stumbled upon in the course of neurosurgical operation, which is probably duplicated in homologous areas of the two hemispheres,

seems to have for its function the reproduction of 1) a remembered event or experience, 2) thinking related to that event, 3) the emotion evoked. . . .As far as this evidence goes then, the conclusion must be that the memory of specific events recorded in temporal patterns sometimes includes the emotions invoked, and the individual's original interpretation of the experience. It seems obvious that such duplicated recording patterns can only be formed in the cortex after there has been complete coordination or integration of all the nerve impulses that pass through both hemispheres, that is to say, all the nerve impulses that are associated with, or result from, the experience. (Penfield)

These temporal lobe memories discovered by Penfield (and all such memory areas in other modalities), it seems, are open to immediate decoupling (experienced as recall and recognition) by current perceptual experiences. Thus, it is postulated that this level is the highest memory level in the per- ceptual sub-system and at the same time, the lowest level in the cognitive sub-system, the latter of which is controlled by the semi-autonomous process. In other words, this level is postulated to be a link between perceptual and cognitive processes. It is also the level of imagery associated with conceptual-symbolic units that we call "specific past experiences." (It is probably this level whereupon the "assumptions" of transactional perceptual theory lie. Hypnosis also probably operates at this level.) The decoupling or recall of these past specific experiences by our central semi-autonomous process is partly the basis for our cognitive process of comparison and judgment in reference to "concrete" (Goldstein) perceptual-cognitive past experiences. Moreover, it should be carefully 325
noted that, although incoming stimuli may be the same for different individuals, the memories decoupled and recalled (many of which are the resultant of the individual's own thinking and reasoning) will be different for different persons according to their past experiences. This results in different interpretations given to the same perception and to the rise of different "sets" and behavior to the same perceptual situation. This fact of individual differences is of salient importance and is the source of the richness in the individual and in any community and culture. . . [*Omitted here is an extensive discussion on societal structure taking place on page 325. Ed.*]

These quantum structural organizations underlying specific past experiences are somewhat analogous to the specific qualities on the first complexing level of the second level of symmetrization with the exception that these past experiences are almost all, if not all (with the exception, of course, of instincts), acquired during the lifetime of the human and, 326
moreover, involve the human's semi-autonomous central process. Within the second complexing level, each separate quantum memory organization seems to contain long complex sequences of specific similar quantum memory organizations that have undergone generalization. These generalized past experiences we call concepts. These concepts are analogous to the sequence of qualities that yield percepts on the second complexing level of the second level of structuring. When these sequences are elicited on the second symmetrization level, we have the perceptual phenomena: objects, situations, events in space, etc.; when the comparable sequences are elicited on the cognitive level, we have the cognitive phenomena: ideas, attitudes, interests, beliefs, opinions, human values (that is, learned social and cultural goals and norms), etc., which in their dynamic form take the form of what we call conceptual thinking. Within the third complexing level, each separate

quantum memory organization seems also to contain long, very complex sequences of similar quantum memory organizations that have also undergone generalization. These generalized concepts which involve language symbols (and include ideas, attitudes, beliefs, goals, etc. that have become abstracted and interrelated) form what are called abstract concepts and personality attributes or traits. When these come into operation, we say the human is "thinking abstractly,"[57] and/or is evincing various levels of character development. Underlying the personality attributes and cognitive processes on this highest complexing level there must be a fantastic field complexity and diversity of the highest order, but accompanying this complexity there must be an equally fantastic ordering and organization of these structural organizations. Moreover, the two highest levels of complexing apparently undergo continuous (mostly sub-threshold) organization, elaboration, and extension throughout the lifetime of the human, being perhaps the major source of the human's cognitive attributes. The lowest level of complexing apparently undergoes elaboration only when the attention process is evoked or when the person is asleep and dreaming.

[[57] "Abstract thought or thinking" certainly does not mean that "the distance between fact and explanation has lengthened" and that abstract concepts, hence, are "unrealistic and un-representational." Nor does it mean that the human personality, after a long period of evolutionary development is becoming more and more pallid—like a dried prune! In fact, quite the opposite is true. These abstract concepts contain the maximum of meaning, the maximum of generality and representation, but in a very small and highly complex structure. And similarly, each personality trait has the essential (which is the meaning of abstraction and not emptiness) of all lower areas within its structure—from the lowest tropistic level to the cognitive level. Such is what makes for the mature and highly differential adult personality of our experience.]

The differentiation and specialization of all three of these levels has 327
progressed the furthest in the human species; the highest complexing level appears to be an exclusive human possession. Moreover, the highest complexing level has become specialized to a degree that the differentiation permits the human to retain records (long complex sequences of quantum structural organizations) of abstracted language concepts which eventually enable the semi-autonomous central processes of the human to reproduce the symbolic concepts in human thinking. (The central process then is able to convey the symbol-involved concepts to the two lower complexing levels.) Language stimuli must consist of highly complex structural configurations which less highly organized and differentiated nervous systems below man are unable to abstract from and record as memories on their most complex memory level and, hence, unable to complex these and reproduce them in the thinking process. Animals think (and also reason), and must think all the time much like humans, but their thinking apparently does not involve language symbols, at least not to any great degree.

Incoming partial structural aggregates from the perceptual levels pass through all quantum memory organizations on the first complexing level. If complexing occurs (that is, if similar quantum memory organizations are present to be decoupled), these decoupled long links of quantum memory organizations are swept to the symmetrization centers. Due to the selective properties of the reticular centers, only one of perhaps many similar quantum memory organizations (in this case, past experiences) enters the

quantum organizations underlying the reticular complex and undergoes structuring and spatial (temporal) ordering. The cognitive aspects of this symmetrization at this particular complexing level appears as the recall or recognition of specific past experiences together with their attendant aspects such as past interpretations made to such situations, including imagery, affect, and motor components.

If the incoming stimuli or decoupled quantum memory organizations (specific past experiences) entering the structuring center are of such a nature that normalizing distortion appears (indicated by current intensity attributes related to an incoming stimulus or by the experience of affective change related to some past experience), the normalizing distortion sets in motion certain underlying events we experience as and call the attention process. On the second level, the partial aggregates from the first complexing level mediated by the semi-autonomous central process, pass through all quantum memory organizations, being generalized in the process. If similar quantum memory organizations are present, these are decoupled 328
and swept to the structuring and spatially ordering centers. The psychological aspects of this structuring appear as what are called concepts and, since sequences of these are usually elicited and since they almost always involve language symbols, we have sequences of such concepts as characterize symbolic-conceptual human thinking. The human is then apparently able (via the semi-autonomous central process) to feed these concepts and conceptual sequences into the third complexing level. The partial aggregates from the second level pass through all quantum memory organizations on this third complexing level also being generalized in the process. If similar quantum memory organizations are present, these are again swept to the structuring and spatially ordering centers. The cognitive aspects of his structuring appear as what is called “abstract” human thinking.[58] The attention process directed into such “abstract” levels of memory aggregates results in what is called “abstract” reasoning. Thus, the most complex cognitive process manifested in all humans is that in the process of human “abstract” symbolic-conceptual thinking and reasoning. (The human is apparently able to elicit or activate all levels at once; thus, he is able to compare abstract concepts with more or less concrete concepts.)

Sustained to and fro sub-threshold feedback occurs between each complexing level and the cognitive level of structuring in the centrencephalic-reticular complex. The phasic motor structural aggregates enter these quantum chains during this prolonged feedback activity. This is how highly specific motor and affective components enter into and accompany conceptual and abstract human thinking. The resultant of the prolonged feedback activity on the first complexing level is the extension and differentiation of complex memory organizations already present on this level. The process results in the formation of current total experience into one composite memory chain and in the interrelating of similar past experiences. (Each modality may have such a memory area.) The resultant on the second level is the formation of generalized interrelated sequences of these specific past experiences called concepts. (There are perhaps only one or two such conceptual complexing areas in each cerebral hemisphere. Perhaps

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[58 "Abstract" human thinking and reasoning are certainly not restricted to mathematics, science, and logic. Nor are they particularly more quantitative than qualitative. Literary works (especially poetry), as well as musical, artistic and dramatic works employ and involve human abstract thinking and reasoning to a high degree. Some of these works emphasize the feeling aspects, some emphasize imagery, some the motor aspects, and some the conceptual aspects. But all are products of the highest cognitive processes of the human personality.]

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they are in the posterior parietal lobe.) The resultant on the third level is 329
the formation of generalized concepts into complex organizations that underlie those complex attributes we call personality attributes. (There is possibly only one such complex area in each cerebral hemisphere. It may be located in the anterior-frontal lobes.)[59]

Thus, the overall resultant of the activities initiated by the incoming stimulus structures is the progressive appearance of the configurational structural symmetry latent in environmental stimuli with the contemporaneous increase of differentiated organization of the memory areas. The transacted stimulus structures, now a part of a vast structural organization, provide the potentialities for the central semi-autonomous process to be described below. By reaching these highest levels, the stimulus field structures have been complexed and symmetrized to the limits of human ability excluding the spontaneously operating central thinking process.

In reference specifically to the second path at the cognitive level of structuring, the aggregate-coupled chains (from the various complexing levels) feed into internal and external complexing motor areas. The external motor complexing areas appear to be in the posterior parietal areas. (Partly as a result of the apraxias which follow lesions in the parietal cortex posterior to the postcentral convolution, this area is now believed to be of great significance in the synthesis of learned patterns of skilled activity.) The internal motor complexing areas appear to be located in areas (controlling highly specific autonomic activities) in the anterior, and possibly in the posterior, frontal lobes. There are probably three complexing levels within each motor system on this level of structuring, each one permitting more ontogenetically acquired discriminative sequences of movements than the other. The manifestations of these highest levels of motor complexing, in reference to the externally oriented muscles, is expressed in highly specific manipulatory activities of vocalization, skilled movements of the hand and fingers and skilled movements of the locomotory appendages. Spoken, sung, and written language is perhaps the acme of manipulatory behavior along with other skilled activities of hand that have made our age the age of technology. The most skilled locomotory

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[59 See, for example, the frontal lobe syndrome (due to impairment of anterior frontal lobes) in *Best and Taylor*, P. 1023-24 (1950) or in many other sources, and note, the many personality and character disorders such as: (1) Lack of social restraint, (2) Distractability and restlessness, (3) Flight of ideas, (4) Lack of initiative, (5) Impairment of memory for recent events, (6) Impairment of moral and social sense, etc.]

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activities possibly appear mainly in recreational activities such as in sports 330
and in dancing. (Dancing—art, music, and the drama associated with it—since time immemorial has been a mode of expression for the creativity of the human personality. Long before the age of Aeschylus, Sophocles,

Euripides and their rivals, our ancestors found outlets for their creative spirit in the song and dance, which modern men and women would do well to recapture. . ..)

Internal and external motor memory chains are decoupled by similar incoming partial aggregates and, as above, if stimuli that contain motor components are not active at the time, motor memory chains are not decoupled and hence muscular movement characteristic of these complexing levels would not occur. If such stimuli are active and they complex similar motor memory chains, these pass to the hypothalamic and central external motor centers that control internal and external muscular contractions. If more general sequences of muscular contractions are being activated on lower levels, the more complex dominant structural aggregates select out, in some way, more specific and directed movements. The external sequences of muscular contractions manifest themselves in the highly discriminative and skilled manipulatory and locomotory activity characteristic of the human. The internal sequences of muscular contractions secrete highly specific (temporal and spatial) patterns of hormones into the fluid matrix.

The changes in and movements of specific external and internal muscles again result in the initiation of the internal stimuli from these systems. These internal and external motor stimuli, in the form of quantum structures, pass to specific and then to central quantum organization within the centrencephalic system and undergo structuring and spatial ordering. These internal and external motor stimuli, now in a configurational and temporally ordered form, enter the other three complexing levels which are active at the time. This is the means whereby conceptual and abstract human thinking acquires motor components and internal affects with all their subtle and momentary variations. The configurational stimuli from externally oriented muscles are experienced as highly specific kinesthetic perceptions. The configurational stimuli from the internally oriented muscles are experienced as the refined affects called feelings.[60]

[[60] It is these feelings that play a preeminently important role, if properly developed, in enabling the human personality and, if improperly developed or left to chance, play as important a role in debasing or severely maladjusting the human personality. Character, embedded in the total structure of personality and its development, in large part, depends upon the proper development of these feelings. Character may be defined (after Cronback) as the way the individual makes choices which effect the welfare of others. . .]

[*Omitted here (large footnote on page 331 of the book) is a non-scientific dissertation on societal structuring.* Ed.]

The internal and external motor structural aggregates, after central structuring, undergo feedback with their respective complexing areas, the memory chains already formed in these areas facilitating their own extension. 331

4. THE CENTRAL SEMI-AUTONOMOUS PROCESS

It would seem that there is a ganglionic mechanism within the temporal cortex that is utilized in making such judgments and that this mechanism has an organization that is somehow separated from the mechanism utilized in the

> recording of contemporary experience. This is indicated by the fact that when the interpretation mechanism becomes the site of epileptic discharge, a predictable change takes place in the subject's interpretation of sensations and experience. . .
>
> *Penfield*

The third path of the aggregate-coupled asymmetry chain from the perceptual level of structuring goes to complexing (memory) areas on the next level of structuring. But on the cognitive level there are no higher 332
levels of complexing to which the structural aggregate-coupled asymmetry chains of the third pathway can go. It is postulated, therefore, that this third pathway is continuously feeding back into the various complexing levels on this, the highest level of structuring, and that it is this process which underlies the continuous thinking activity of the human. Since these complexing levels invariably involve organizations that have symbolic-conceptual characteristics, and since the process may be in synchronization with, or act independently of, the perceptual process, this continuous aggregate-coupled asymmetry chain activity (feedback) and structuring process is referred to as the spontaneous semi-autonomous symbolic-conceptual thinking process of the human which operates in, and from, the central quantum organizations underlying the reticular formations in the highest level of symmetrization in the centrencephalic system. This spontaneous semi-autonomous structuring activity and feedback goes on constantly unless perceptual processes disrupt it via the evoking of the attention process.

Ordinarily, incoming interoceptive and exteroceptive stimuli reach the first complexing level of this highest structuring center and elicit (decouple) similar memories recorded on this level. If similar quantum memory organizations are not present to be decoupled, we experience only the first two levels of symmetrization (perceptual processes) and the spontaneous thinking associated with the semi-autonomous activity of the third level of symmetrization. If there are similar quantum memory chains in the first complexing level, then decoupling ensues and the recall of specific past experiences, together with their past interpretations and affect, occurs. And if affect is involved (actually qualitatively different configurational forms of quantum field patterns with internal empirical referents) in the recall of the past experiences, the spontaneous thinking is disrupted; that is, the spontaneous feedback activity of the semi-autonomous process is disrupted. At this moment it is said that the attention process is evoked.

The disruption of the spontaneous central process is the event that puts the perceptual process and cognitive processes in synchronization—that is, all three structuring centers are now acting as a synchronized unit. The central aggregate-coupled asymmetry chains now feed into the same level as the perceptual process. The structural aggregates on the central asymmetry chain induce a configurational sensitization (determined by the incoming stimuli and the specific past experiences redintegrated) to certain quantum memories, the structural asymmetry nature of the asymmetry chain raises these structures to an asymmetry (energy) level that is just below or above threshold. (That is, the central process induces structural asymmetry of a configurational nature such that the asymmetry, or energy, level of certain specific memories in the first complexing level is raised to just below or—in

the case of sustained habitual motor behavior—above threshold.) This action thus sensitizes—configurationally and, at the same time, energetically—certain perceptual level memories so that when certain environmental cues appear, decoupling of the sensitized memories readily occurs with the experienced phenomena of perceptual-cognitive recognition.[61] In this way, the hierarchy of memories (which determines the particular memories that will be decoupled by an incoming environmental stimulus and also which stimulus will reach the structuring center first) is controlled by the central semi-autonomous process or the cognitive processes.

This induction of configurational asymmetry into our highest perceptual memory level is what "sets" us to perceive or behave selectively and in sustained fashion to our environment. When the aggregate-coupled asymmetry chain of the central process is oriented thus toward the environment we call the orientation and experiential phenomena "expectancy" or "anticipation." When it is oriented toward motor response so that sustained activity—such as in a series of locomotory or manipulatory movements—is manifested, we call the orientation and behavioral phenomena "intention." The central process may induct its configurational asymmetry at a high asymmetry level into any or all three of its complexing levels. It is at these moments that we compare our perceptual experiences with past cognitive processes, make decisions or predictions based on this comparison activity; in other words, at these moments we interpret, judge, reason, makes choices, plan, etc. When the central process, at a lower asymmetry level, is directed into these complexing levels, again exclusive of exteroceptive stimuli, we daydream, fantasize, etc.

"Set" thus is the induction of configurational asymmetry by the semi-

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[61 Actually, the whole process is cyclic. The configurational asymmetry inducted by the third level into certain perceptual memories sets up a symmetrization tension or tendency in these selectively activated memories. When the structural counterparts of these sensitized structures enter the organism, the symmetrization or structuring is completed and what we experience as recognition is the resultant of the completion of the configuration initiated by the third level process. Another way of saying the same thing: the central process sets up a partial structure of a specific configurational sort in the organism which the environment completes.]

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autonomous process along a particular memory chain so that we think, perceive, 334
and behave in a sustained manner to, and in accordance with, specific memories and not others. When "set" is in operation our perceptions take on what is called cognitive meaning or significance. That is, we are able to interpret or judge the significance or cognitive meaning of our environment via our perceptual experiences. Moreover, due to the above manner of inducting structural asymmetry, our past experiences (interpretations, assumptions, purposes, values, attitudes, etc.) and our conceptual learning process are called into play and are involved in relating ourselves to the various aspects of our environment.

This third pathway of contiguous aggregate-coupled asymmetry chain feedback is probably by far the most important process involved in human behavioral motivation, as well as in what is ordinarily thought of as human learning, and is the main process underlying the organization and

appearance of complex attributes that characterize the human personality. The rate of structuring (the rate of formation of structural aggregates) in the central center may well be what accounts for differences in levels of human intelligence. (Thus, a hormone or enzyme which could raise the structuring rate in the reticular structuring center might have a marked effect on the intelligence level.) This constant to and fro activity (of the spontaneous semi-autonomous conceptual-symbolic process) from specific and central symmetrization centers to the various complexing levels, results in the continuous sending of symbolic-conceptual quantum memory organizations, coupled onto the asymmetry chains, into the various complexing levels. In doing so, these symbolic-conceptual quantum memory organizations traverse the quantum structural organizations involving past concepts and sequences of concepts and result in the continuous feedback of these decoupled links into the specific and central quantum organizations underlying the reticular formations and the structuring experienced as our symbolic-conceptual thinking. (The ingoing partial aggregates become transactionally complexed and generalized by similar quantum memory organizations underlying these concepts and sequences of concepts.) By this spontaneous activity, the semi-autonomous process continuously brings forth motivational factors (concepts or conceptual sequences which contain affective and motor components), and these appear in human thinking and/or simultaneously in highly specific locomotory and manipulatory activity. The spontaneous activity results in the constant redintegration of these past conceptual sequences; cognitive thinking activity and behavior usually proceed along a specific path.[62] By this semi-autonomous central process, the human is able to send quantum memory aggregates to motor and other complexing areas and thereby precisely control his thinking and his overt behavior.

The configurational sequences of external muscular contractions under symbolic-conceptual control (manifesting themselves in highly discriminate patterns such as in speech, skilled movements of the hand and fingers, etc.) serve to order progressively the spatial relations of the various aspects of the human environment with respect to the individual and with respect to the social cultural groups of which he is a part. Human societies, by the organized accumulation of countless millions of inventions and discoveries,[63] transmitted mainly by the written and spoken word, have devised

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[[62] Human behavior and human motivation appear to be based far more on the continuous redintegration of these sequences of concepts, which may or may not involve affective components but which do involve past value judgments and interpretations, than upon interoceptive stimuli such as the primary drives or upon perceptual-emotional situations as seems to be largely the case in lower animals. In animals, environmental stimuli structured into perceptions do not elicit conceptual-symbolic interpretations (conceptual activities are apparently elicited but not symbolic-conceptual activities—at least not to any great degree) nor do their central semi-autonomous processes elicit such activities, while in the human internal and external perceptions can initiate such language involved concepts which in turn can elicit other long sequences of such concepts with or without affect. Thus, lower animal behavior remains closely related to the immediate internal and external environment. Human behavior, on the other hand, is motivated, sustained and directed via decoupling of language involved concepts which can elicit long chains of symbolic activities called interpretations and judgments, etc., which may or may not involve effect. This does not deny that affects play a large role in the motivation of human behavior but it suggests that neutral conceptual-symbolic factors may have just as great, if not far greater, a role in the motivation of human

behavior. Humans are more conceptually-symbolically oriented, can and do base most of their actions on complex judgments and interpretations; however, the affects are not to be slighted or neglected. They still play a powerful role.

[[63] The same was put rather picturesquely as follows:

> It is with powerlessness that thought comes . . . This beast was on the verge of something; he had hands free from locomotion. They could explore things in the surrounding environment; they could close around sticks and stones, move things from place to place. The creature had set out on the loneliest road in the universe, though he was not yet aware of it. He was destined to grow aware of the past and future; he was about to go behind the hitherto accepted face of nature and people the dark with gods.
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> *Marston Bates*]

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complex extrapolations of the individual's intrinsic means of communication, 336
manipulation and locomotion. [*Omitted here is social commentary and its related large footnote 64, comprising pages 336-337.* Ed.]

. . .Moreover, the spatially and temporally specific configurational patterns 337
of secretion of hormones into the fluid matrix serve to control precisely the internal developmental processes. This latter specific or precise control of the internal processes, and its progressive attainment as the human matures, is reflected in less and less non-specific emotional involvement in life situations. . .

. . .Moreover, it is this process of semi-autonomous structuring activity that 338
enables the human to order and reorder his conceptual sequences and/or form new concepts and conceptual sequences to extend and differentiate those already formed; this is, hence, the basis for human symbolic-conceptual learning. That is, with the evoking of the "attention" process, the spontaneous aggregate-coupled asymmetry chains, or what is called our thinking processes, are fed into the level of specific concepts, and by their decoupling action, bring back similar quantum memory organizations to the specific and cognitive reticular center where they are recombined and ordered and experienced as our thinking process which is taking place in the quantum structural organization underlying the central reticular formations at the highest level of symmetrization. These are then recorded as new sequences of concepts whose future elicitation guides and directs more discriminate human thinking and locomotory and manipulatory activity. . .
[*Omitted here as social discussions are the last two paragraphs of page 338, its footnote 65, and footnotes 66 & 67, comprising most of page 339.* Ed.]

. . .The constant to and fro activity of aggregate-carrying asymmetry chains 339
from specific and central symmetrization centers to various levels of complexing, besides bringing motivational factors into continuous cognitive activity,[67] and besides being the basis of the human symbolic-conceptual judgmental and learning processes, is also a constant sub-threshold organization producing process. [*Omitted are psychology footnotes 66 and 67 that comprise most of page 339.* Ed.]

340 - 343

[*Omitted as social-psychological discussions are pages 340, 341,342, 343 in their entirety, along with the first paragraph of page 344. We resume on page 344 with the section on the Adaptation Process.* Ed.]

Q. THE ONE-WAY DIRECTION OF DEVELOPMENT: THE ADAPTATION PROCESS

344

It has been postulated that the human nervous system is a system of hierarchically arranged symmetry forming processes or, in terms of empirical referents, a system of hierarchically arranged creative structuring processes which facilitates the formation of structural aggregates in a manner and with the developmental direction described by Whyte, whose description is paraphrased below:

> The system organism-environment is marked by an oscillating equilibrium between two sets of processes: the local symmetry forming processes of the organism's hierarchical system and the processes of the wider system of which it is a part. . . The result of this oscillating equilibrium is the development of the organism's hierarchical processes and a gradual increase of mutual conformity between organism and environment.

In terms of the postulated structural organization of the human's nervous system, "the local symmetry forming processes of the organism's hierarchical system" refer to the hierarchically arranged three or more levels of quantum structuring processes underlying the reticular formations. The "processes of the wider system," which play a role in the structuring process as outlined and postulated above, refer to the processes of the unitary field as a whole; in other words, this refers to the normalizing process and its properties. The "oscillating equilibrium between two sets of processes" refers to the fact that the recombined stimuli constantly tend to approach their latent symmetry which tendency is as constantly opposed by the repolarization activity of the normalizing process. This process results in the continuous formation of the quantum structural aggregates which subsequently serve to differentiate the memory organizations of the organism. Taking the system organism-in-environment as a whole, a living organism is a hierarchically arranged system of interrelated and interdependent transacting sub-systems each of which, as well as the system as a whole, is in a continual state of this oscillating symmetry tendency resulting in the formation of these structural aggregates in the structuring centers. The sub-systems of the organism and the organism and environment transact via the means of stimuli and quantum structural aggregates coming 345 to or from these structuring centers. The transactional mode of process between sub-systems and between the organism and environment takes into account the historical differentiated order already present in the organism. (What enters combines with what is already present and the resultant aggregate is the factor of operation.) Thus, current development and the behavior and experiential phenomena of a particular moment or an organism depend upon the present stimuli and the differentiated order of the past. This historical feature is perhaps the main difference between a living organism and a machine. (Bertalanffy) Actually, five billion and more years of creative structuring activity separates the human organism

from a stone or a machine. Both the mechanistic-materialist and the vitalist slight or miss this salient point of a long creative development.

Each differentiated sub-system in an organism operates in such a manner as to eliminate deviations of a specific type from the asymmetry norm. The structural aggregates formed in the process to which the environment and organism both contribute are coordinated (interrelated on the asymmetry chain) as components of the comprehensive normalizing process of the organism in its environment. That is, each differentiated sub-system, in eliminating normalizing distortions of its specific type, produces structures which the environment completes. These then feed into structuring centers that form and spatially interrelate the various structural aggregates (from different sub-systems) on a common asymmetry chain. These structural aggregates are then used by the structuring process (a part of which is the normalizing process) to develop structural organizations, functions, and activities that promote the symmetry tendency of the normalizing process in the organism-in-environment system.

The basic developmental characteristics observed in living organisms—growth, heterogeneity, complexity and the progressive ordering and organizations of this development so that the organism and environment conform—may be considered a consequence of the fact that the structures and processes of living organisms are the resultant of the continuous formation of quantum structural aggregates on all levels of the structuring hierarchy and of the fact that the normalizing process has a controlling influence over the structural aggregates beyond the isolable processes.[70] That is, the normalizing process controls the differentiated development of the

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[[70] The reordering and extension of the aggregates in the chains of quantum field patterns on the genetic level is called crossing-over and mutation (the latter of which was postulated to be due to the formation of new structural aggregates) and on the neuro-physiological level is called memory formation. The resultant product of these extensions

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organism on all levels by using the structural aggregates formed in these 346
processes to promote the growth, heterogeneity and complexity of the organism's sub-systems. This development is ordered and organized (integrated) in such a way as to promote its symmetry tendency in a particular organism-in-environment system. In short, genetic, biochemical, physiological, and neuro-physiological, phylogenetic and ontogenetic development is postulated to be due to changes in, and the action of, interdependent and interrelated quantum field patterns which are controlled and synchronized by the normalizing process. The normalizing process and its complement of quantum field patterns is the empirical process and its symmetry tendency is the law of organism which develops, interrelates, and unites the sub-systems of the organism and the organism and environment into one structural-functional unity.

The progressive differentiation of quantum memory organizations takes place in such a way that the stimuli and structural field patterns which facilitate the symmetry tendency of the normalizing process tend to be retained and differentiate the memory organizations of the organism while those stimuli and structural field patterns of the quantum memory

organizations that distort this symmetry tendency tend to be eliminated selectively. The overall resultant is a gradual increase of normal conformity between organism and environment. (Basically, development is the formation of the quantum field patterns due to the decrease of asymmetry but the further development initiated by the normalizing structuring process must conform to the overall formative tendency in the quantum field—a decrease of asymmetry. The unitary formative tendency is never complete—the organism is in a continual state of stimulation and formation of structural aggregates which initiate processes and develop structural organizations which, in turn, continuously tend to bring organism and environment into conformance.[71])

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and reordering of aggregates on the genetic level over long geological eras is the formation of new characters and species. The resultant product of these extensions and reordering of aggregates and formation of new aggregates on the neuro-psychological level during the human's life span is the formation and change of percepts, assumptions, concepts, ideas, personality attributes, etc. Or to use a common term—phylogenetic and ontogenetic structural differentiation with related processes and functions is due to phylogenetic and ontogenetic differentiation of quantum structural field patterns which are controlled by the normalizing process.

[[71] In other words, the normalizing-structuring process, if structural organization within the organism and environmental conditions and circumstances permit, continuously adjusts the organism to even momentary changes in the environment. This is best seen in the cognitive processes called ego defensive mechanisms, such as that or rationalization, which are universally employed by humans. The same adjustive process is very likely also continuously

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347 The normalizing process is the causal process behind the selective elimination and selective retention of stimuli and memories that distort and promote its symmetry tendency respectively for it selectively eliminates stimuli and memories that do not promote the growth and differentiation of the organism's sub-systems in conformance with the environment.

It is the patterns of quantum field structures controlled and synchronized by the normalizing process that are responsible for the orderliness and creative

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operating on the genetic level. For example, if humans develop cognitive organizations that facilitate their mutual development and these are used over a long period of time, we could expect that these cognitive organizations would subsequently appear in the human's phylogenetic memory organizations much as what are now called instincts appear. All instincts are complex memories in the organism that promote the organism's relationship to the environment. There are no destructive or self-defeating instincts per se in any organism. Environmental conditions and circumstances may make them so but they are not intrinsically so. Moreover, it should not be thought that the normalizing process adjusts the organism in relation to some particular purpose or goal or in a particular structuro-functional way as envisioned by Lamarck. It works simply to make organism and environment conform with the development potentialities available, for in that relationship the normalizing distortion is reduced to a minimum and the symmetry tendency of the normalizing process restored. Naturally, if a species or an organism have quantum memories which develop internal structural organizations that cannot change, the normalizing process cannot promote further conformances of organism and environment. Such organisms must seek an "ecological niche" to prevent disruptive normalizing distortions from developing. Moreover, since the normalizing process is not foresightful, and since the environment sometimes changes very rapidly, an organism or species may be left with a structural organization that does not promote the organism's or species' conformance with its particular environment and which the normalizing process cannot selectively eliminate rapidly enough. But in most cases, given the time, the proper circumstances and conditions, the normalizing process adjusts the organism

to its particular environment so that it conforms to that environment. This relationship is essentially what the psychological therapist attempts to bring about despite the diverse theoretical trappings with which he may surround the therapy sessions. He discovers the distortion-producing cognitive memory patterns (motivational conflicts, personal inadequacies, etc.)—which may be a difficult task because all humans resent intrusion into their private lives, even by the therapist—and then he seeks to have the patient reorder these patterns or form new ones that both remove the distortion and put the human into the proper relationship with his environment. This latter process is the adjustive situation and again may be an exceedingly difficult task because the patient's personality may be greatly disorganized and his social-cultural environment may itself need drastic changes. This, in many cases, is a practical impossibility. But in most cases, given the time, the proper social and cultural conditions, the therapist can bring the patient and environment back into conformance or relationship. And if the personality is not too badly disorganized and if favorable cultural and social conditions persist, the normalizing-cognitive processes of the human will gradually reorganize the personality. Thus, the human personality, much like the structural-functional processes on the physiological level with which the medical doctor deals, will gradually restore its healthy organization, if given a chance. It is, of course, the normalizing process which causes this intrinsic tendency toward healthy organization.]

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nature of developmental process on the bio-chemical and physiological level. 348
That is, the normalizing process and its directive structural aggregates control the harmony or proper timing and spacing of [the] physio-chemical process. This harmony leads to the occurrence of growth in each cell and larger physiological sub-system at the appropriate time and place. However, even after differentiation is complete, the normalizing process continues to operate (to maintain its symmetry tendency) in each differentiated sub-system and send specialized stimuli back to the structuring centers and to the memory patterns which control further adjustment of the sub-system to the momentary conditions within and without the organism. It is this cyclic arrangement that establishes and maintains the structural-functional integrity of all sub-systems in such a way as to keep or bring organism and environment progressively into conformance.

Changes in the timing or synchronization of the quantum stimuli and aggregates as they traverse the nervous system determine which stimuli and aggregates reach the structuring center first and hence, the change in timing is an effective way of controlling the developmental processes which the structuring aggregates initiate. The stimuli that reach the structuring centers first are the ones that undergo structuring and are subsequently channeled into other sub-systems such as internal and external muscular systems. The normalizing process, by controlling the timing, controls the stimuli and the structural aggregates by impeding or facilitating their path to the structuring centers or on their way to other sub-systems from the structuring centers. The normalizing process controls the timing via its control over parasympathetic (acetycholine) and sympathetic (adrenalin) hormone secretions. Acetylcholine and its chemically related substances and adrenalin and its chemically related substances, maintain a balanced regulation of transmission across the synapse. Acetylcholine speeds up, or aids, the process of transmission whereas adrenalin inhibits such transmission. (Marazzi) In this way, the normalizing process eliminates the distortion-producing stimuli and structural aggregates and facilitates the symmetry-promoting stimuli and aggregates. That is, the latter undergo structuring and initiate developmental processes and further differentiate the memory areas thereby insuring a progressive relation of the organism to its specific environment. Differentiation of the genetic and neuro-

physiological structural memory patterns is not, it is postulated, a product of chance but is determined by the normalizing process operating in the organism-environment system which tends to bring the organism and 349
environment progressively into conformance. The mode of operation of the normalizing process is thus prevention of the operation of distortion-producing stimuli and structural aggregates in and between the organism and environment and in and between sub-systems of the organism. Thus, in living organisms the normalizing process leads to the selective elimination of stimuli and structural aggregates that do not facilitate normalization, and furthers the extension of those memory organizations—and hence the selective sensitivity to certain stimuli—that do facilitate the symmetry tendency of the normalizing process.

The tendency toward progressive selective sensitivity to stimuli and the selective extension of quantum patterns so that the organism and his environment progressively approach mutual conformance is what is meant by the one-way direction of development. In the human this tendency is manifested as increasing perceptual and cognitive (which includes affective) discrimination and increasingly ordered and differentiated personality growth and behavior in relation to a particular environment. (Locomotory, manipulatory, migratory activity on the part of any sub-system or by the organism as a whole, collectively called the behavior pattern, is actually part of its configurational symmetry tendency in a particular environment much as the motion and movements of the particles are part of the configurational symmetry tendency or pattern of a particular sub-system on the quantum level. For the human, configurational tendencies on all levels—biochemical, physiological, psychological, social—are part of the same configurational symmetry tendency to bring the organism and environment into conformance. All patterns of processes and activities are controlled, in the last analysis, by the normalizing process using the structural memory patterns as its directive and developmental agents.)

The development of selective sensitivity to environmental stimuli that distort and facilitate the organism's configurational symmetry tendency in a particular environment (via the selective development or selective elimination of memory organizations and hence, the processes and behavior that they initiate) is the basis of the adaptive process and operates on all levels of the living organism from the genetic to the neuro-physiological... (Omitted here are the last 4 lines on page 349, all of page 350, 351—footnote 350-352
71--as being strictly social commentary; we resume on page 352 with its footnote #72. Ed.)

In reference to the quantum memory chains, memory formation consists of the formation, extension and reordering of chains of quantum field patterns. [According to traditional neurophysiology, memory formation and learning involves neural changes of reduced synaptic resistance. Due to these psychological processes, synaptic boutons are developed with lower resistance which leads to the formation of reverberatory circuits, cell assemblies, phase sequences of these cell assemblies, etc. (Hebb)] The extension and reordering of these patterns of field structures is due to the self-facilitating property of memory organizations already present and to

the incoming aggregates from the structuring centers that provide the means for this extension and reordering to take place. On the second of three complexing levels on the third symmetrization or cognitive level, as outlined above, this memory formation is called concept formation.[73] Learning is the resultant of the formation of these structural aggregates, of the extension with these aggregates of the quantum memory patterns into specific sequences of varying length, and of the restructuring of these patterns by the normalizing-structuring process once the memory has been recorded. (The extension of quantum memory chains into specific sequences of varying length is the extension into concepts or interrelated concepts on the second complexing level—the varying lengths of the sequence being determined by the duration that the "attention process" was operating when the sequences were being formed. This does not necessarily hold for the perceptual level.) Thus learning results from the formation of these aggregates

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[73 As will be recalled from the above, quantum memory chains are postulated to possess one central chain with as many subsidiary chains as modalities that were activated (and hence became spatially contiguous with the central memory) at the time it was being recorded, including internal and external motor memories. Hence, since these quantum memory organizations underlie what are called concepts, every concept has internal and external affective and sensory components and internal and external motor components.]

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and from the extension and restructuring of spatially ordered sequences of 353
these specific quantum memory organizations. [74]

At present there are two main varieties of learning theory in psychology. These are called the "association" theories and the "field" theories. The first type (such as Hull's) is mechanistic and employs conditioned-response constructs and logic. This type of learning theory interprets learning as "a bit-by-bit", gradual and continuous acquisition, through reinforced repetitions, of the strength of a linkage between a stimulus and a reaction." The second type (such as Tolman's) is based on the classical notion of field as employed by Gestalt theory. "A goal is achieved or a field coming, through the behavioral act, to equilibrium are the dynamic principles." In this latter theory the organism is postulated to learn meanings and relationships rather than the specific movements to be made in a particular stimulus situation. This theory predicts that the acquisition of whatever is learned will be a fairly sudden, discontinuous process such as, for example, in insight, for learning represents a coming of the cortical field to equilibrium. These two varieties of learning theory—which includes a broad field—have perhaps, with the exception of perceptual theory, written the most brilliant pages in the history of experimental psychology.

[74 The resultant of memory formation is called learning on the neuro-physiological level and evolution on the genetic level. There are thus three basic types of learning due to the formation, extension, and reordering of these quantum aggregates and quantum patterns, respectively, on the three structuring levels. First, we have "tropistic learning" which we could call "reflexive" learning. This type of learning was first studied by H. S. Jennings who incidentally did not call it tropistic learning. Secondly, we have "perceptual learning." On the first perceptual level (which utilizes the lower level), this is the classical conditioning of Pavolv, Hull, Miller and Dollard, Spence, etc. On the second perceptual level we have the instrumental learning of Skinner. [Tinbergen describes the instinctive act as beginning with

the "random movement" or "exploratory behavior," which he calls "appetitive behavior," and ending with an instrumental act which he calls "consummatory behavior." This description is identical in its entirety to that act which Skinner describes as "instrumental learning." This is of great theoretical interest for it indicates a continuity instead of a discontinuity between phylogenetic (genetic) development—such as in maturation—and ordinary learning. R. H. Wheeler, in fact, pointed out this continuity long ago in his "maturational hypothesis," but up to now has been largely ridiculed for his efforts.] This level, as all other higher levels, utilizes the organization present on lower levels. Thirdly, we have the 'perceptual-cognitive" learning of Tolman and the long list of Gestalt psychologists. On the second cognitive level, we have "conceptual learning" which is currently a subject of intense study. On the third level, we have "abstract" or principle learning which is also a subject of current research. All the other types of learning posited, this writer suggests, can be subsumed under these three basic type of learning.]

From the viewpoint of this development, the two types of theory are 354
regarded as actually complementary with respect to both the basic parameter underlying learning and in their ways of accounting for how learning takes place. It is postulated that the bit-by-bit gradual and continuous strengthening of linkages between the components of the first type of learning theory actually points to both the basic elementaristic-aggregate nature of the learning parameter—the quantum structural aggregate—and to the fact that one type of learning takes place by the gradual extension (differentiation) of the quantum memory organizations via the use of these aggregates. It is postulated that the second type of theory points to both the creative field nature of the basic learning parameter or the structural aggregate and to the fact that learning can be sudden because of the formation of new structural aggregates in the structuring process or by the rapid reordering of the quantum patterns already recorded. Moreover, the organism learns meanings, relationships and specific movements in a particular situation through the interrelating of aggregates in the structuring process that contains and yields these factors and feedback. Taking the two theories together—but rejecting both their mechanistic and classical field bases as we did in the section on the history of field theory—we have unitary theory, the concept of the structured field with its asymmetry to symmetry tendency which underlies and appears in all processes in the universe, in this case in human memory formation and human learning. Points on reinforcement, expectancy, meaning, significance, etc., have already been briefly touched upon or will be discussed below.

The semi-autonomous central process, especially because of the human ability to symbolize, is a superbly efficient process for forming concepts and reordering concepts into spatial (temporal) sequences. These concepts can be ordered and reordered into any sequence that suits the individual via the means of his quantum-pattern-symbolic-concepts and his structuring-feedback process. New learning occurs by the formation of new quantum pattern-concepts, and by the extensions of quantum memory organizations or by reordering the spatial sequences of concepts previously formed. Adaptation or relation of the human to the environment is thus most easily effected by the spatial reordering of previously formed concepts or by the forming of new concepts—in either way new cognitive meaning and relationship arises. This cognitive activity is also a supremely efficient way of selectively eliminating distortion-producing stimuli and quantum memory patterns nd their functional resultants. The normalizing distortion,