The Ontology of Christopher Langan's Psychical Physics: The Neuropsychology of the Atemporal Recursive Processes—an empirical framework.

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Abstract:

Christopher Langan's CTMU offers a new look into an old place: the universe. This theory is both attractive and elusive, a mixture of cosmology and ontology which promises a reunification of what science has so ignobly divided. While the cosmological and spiritual pieces of the puzzle are beyond the scope of this author's competence to define, I propose to demonstrate through specific psychological and neuroscientific example, some of the more tantalizing and etherial ideas mentioned in the CTMU. These ideas are tangible, and are subject to direct daily observation, and hence, empirical demonstration. It should be noted that I am an atheist, and need carry no baggage for Mr. Langan, who has in the CTMU offered up a new idea, one which can be proven or disproven as science, an idea worthy of *consideration* quite apart and independent of one's personal beliefs. Indeed, it is difficult to look at things in a new way, our very mental structure all but forbids it, the lateral prefrontal cortex providing a definitional template for experience, pairing down the information available to us, measuring the situation against *our preconceptions*, structures so very necessary for forming our snap judgments, and also, so inhibitive in the understanding of a new idea which does not conform to them (Gazzaniga, 2009 pp. 578-579). I propose to demonstrate the atemporal cycles of Christopher Langan's telic recursion, as it defines our internal universe and experience. This proof will be multidisciplinary in drawing together threads from a convergence of depth psychology, experimental psychology, and cognitive neuroscience. This ontological proof will be concluded with a series of experimental constructs, which although general, will outline a methodological approach toward demonstration of the psycho-ontological aspects of the CTMU, leaving but a clear experimentally defined articulation of the proposed theoretic connective tissue underlying the unity of the psychical and the physical, to close the empirical gap.

Telic recursion: The coexistence and connectivity of Past, Present and Future

In order to elucidate the application of the theories explained in the CTMU by way of specific example, I will ease my task by focusing my observations clearly in the theatre of the psycho-ontological. To accomplish both my expository, and my experimental, and therefore, linear aim, I must first decide upon a specific piece of theory in the CTMU which will allow me access along the self-referential and circular route of tautological self-containment. This pathway will become clear as we find foothold and firm purchase upon what appear at first, to be some of the more unlikely propositions put forward in the CTMU. I will encourage the reader to take in the entire of the CTMU for themselves, but, once cautioned as to the limits of extracting any fact from its context, I will now do exactly that, and present a few prime pieces of theory to which I will refer again and again, many of which appear as paradox, but are in fact, an everyday dynamic which underlies reality, a dynamic which if working properly, goes unnoticed:

1. Inasmuch as science is observational or perceptual in nature, the goal of providing a scientific model and mechanism for the evolution of complex systems ultimately requires a supporting theory of reality of which perception itself is the model (or theory-to-universe mapping). . .

. . . the universe refines itself from *unbound telesis* or *UBT*, a primordial realm of infocognitive potential free of informational constraint. Under the guidance of a limiting (intrinsic) form of anthropic principle called the *Telic Principle*, SCSPL evolves by *telic recursion*, jointly configuring syntax and state while maximizing a generalized self-selection parameter and adjusting on the fly to freely-changing internal conditions. (Langan, 2002, p.1)

2. The currency of telic feedback is a quantifiable self-selection parameter, *generalized utility*, a generalized property of law and state in the maximization of which they undergo mutual refinement (note that generalized utility is self-descriptive or *autologous*, intrinsically and retroactively defined within the system, and "pre-informational" in the sense that it assigns no specific property to any specific object). Through telic feedback, a system retroactively self-configures by reflexively applying a "generalized utility function" to its internal existential potential or possible futures. In effect, the system brings itself into existence as a means of atemporal communication between its past and future whereby law and state, syntax and informational content, generate and refine each other across time to maximize total systemic self-utility. This defines a situation in which the true temporal identity of the system is a distributed point of temporal equilibrium that is both *between* and *inclusive of* past and future. In this sense, the system is timeless or *atemporal*. (p.6-7)

3. In short, two-valued logic is something without which reality could not exist. If it were eliminated, then *true* and *false, real* and *unreal*, and *existence* and *nonexistence* could not be distinguished, and the merest act of perception or cognition would be utterly impossible. (p. 13)

4. According to the nature of sentential logic, truth is tautologically based on the integrity of cognitive and perceptual reality. Cognition and perception comprise the primitive (self-definitive) basis of logic, and logic comprises the rules of structure and inference under which perception and cognition are stable and coherent. (p. 13)
Therefore, the proposed tautology-preserving principles of reality theory should put mind back into the mix in an explicit, theoretically tractable way, effectively endowing logic with "self-processing capability". This, after all, is exactly what it possesses in its natural

manifestation . . . (p.14)

5. To put it another way: if the “noumenal” (perceptually independent) part of reality were truly unrelated to the phenomenal (cognition-isomorphic) part, then these two “halves” of reality would neither be coincident nor share a joint medium relating them. In that case, they would simply fall apart, and any integrated “reality” supposedly containing both of them would fail for lack of an integrated model. (p. 23)

6. In CTMU cosmogony, “nothingness” is informationally defined as zero constraint or pure freedom (*unbound telesis* or *UBT*), and the apparent construction of the universe is explained as a self-restriction of this potential. (p. 27)

7. Conspansion describes the “alternation” of these units between the dual (generalized-cognitive and informational) aspects of reality, and thus between syntax and state. This alternation, which permits localized mutual refinements of cognitive syntax and informational state, is essential to an evolutionary process called *telic recursion*. . . the conspansive nesting of atemporal events puts all of time in “simultaneous self-contact” without compromising ordinality (p. 30)

8. By putting temporally remote events in extended descriptive contact with each other, the Extended Superposition Principle enables coherent cross-temporal telic feedback and thus plays a necessary role in cosmic self-configuration. Among the higher-order determinant relationships in which events and objects can thus be implicated are utile state-syntax relationships called *telons*, telic attractors capable of guiding cosmic and biological evolution. (p. 31)

9. The process of reducing distinctions to the homogeneous syntactic media that support them is called *syndiffeonic regression*. This process involves *unisection*, whereby the rules of structure and dynamics that respectively govern a set of distinct objects are reduced to a “syntactic join” in an infocognitive lattice of syntactic media.

10. It follows that the active medium of cross-definition possesses logical primacy over laws and arguments alike, and is thus pre-informational and pre-nomological in nature…i.e., *telic*. *Telesis*, which can be characterized as “infocognitive potential”, is the primordial active medium from which laws and their arguments and parameters emerge by mutual refinement or *telic recursion*. (p. 35)

11. The Telic principle simply asserts that this is the case; the most fundamental imperative of reality is such as to force on it a supertautological, conspansive structure. Thus, the universe “selects itself” from *unbound telesis* or UBT, a realm of zero information and unlimited ontological potential, by means of *telic recursion*, whereby infocognitive syntax and its informational content are cross-refined through telic (syntax-state) feedback over the entire range of potential syntax-state relationships, up to and including all of spacetime and reality in general. . . the Extended Superposition Principle, a property of conspansive spacetime that coherently relates widely-separated events, lets the universe “retrodict” itself through meaningful cross-temporal feedback (p. 38)

12. Where the term *telesis* denotes this common component of information and syntax, SCSPL grammar refines infocognition by binding or constraining telesis as infocognition. (p. 43)

13. While an ordinary grammar recursively processes information or binds informational potential to an invariant syntax that distributes over its products, Γ grammar binds *telesis*, infocognitive potential ranging over possible relationships of syntax and state, by cross-refining syntax and its informational content through telic recursion. Telic recursion is the process responsible for configuring the syntax-content relationships on which standard

informational recursion is based; its existence is an ontological requirement of reality. (p. 44)

The metapsychology and neurophysiology of telic recursive function:

So dear reader, now that you have seen the ideas, can you grasp them? It seems as if they are an impossibility, but to look more closely, one can find more than a shadow of reality in them, in fact, these processes live in the shadows of the normal mind, and can be seen to appear everywhere once one has learned to look. But where? Where is one to find such elusive concepts and dynamic relations which seems so separate from each other as past, present, and future? Surely these ideas are exclusive and separate, not interactive or self-configuring in any way! Although this seems a safe and assured position from which to judge the situation, closer inspection will reveal the fact to be otherwise.

Please indulge me to follow this most basic example, and understand that in the ideas of past, present and future, we see just that: ideas! Concepts!—

We are directly present to our externally triggered representation of the world, an internal experience which impinges upon the mental system through stimulus originating from without. We are also present to our inner world of thought and fantasy, which also impinges upon the mental system, but from stimulus originating within. The concept of the present, then, is directly accessible to us in experience, and has as its ontological neural substrate, what I will call: the Perceptual System. While we are conscious, I will propose as a simplistic starting point, that this system encompasses the intrasystemic activity of all the limbic structures, and, the higher areas involved in perception invigorated to produce cortical tone by the ascending activating system (Solms, 2002, pp. 264-267). The past is also a concept, and has as its neural substrate, what I will call the Long-Term Mnemic System. This system encompasses the neural structures which provide for *long-term memory* and its retrieval into consciousness, such as the neocortex (Gazzaniga, 2009, p. 331). Let us now bring the future into focus by remembering that it too is but a concept, and, finds its neural substrate in those areas associated with anticipatory thought and long-term goal-oriented behavior, along with situational planning, such as the pre-fontal cortex, (Gazzaniga, 2009, pp. 555-598).

With this most basic picture in mind, we can see our way around the problem, even if at first, only in a myopic way. In even a single moment of our lives, the seamless integration and mutual affective dynamism of past, present and future is available to observe. We sit in class and think of the next lecture, and the exam to follow, and begin to worry, only to remember the last exam, and then relax, as we got an "easy A." Our past defines what we may well expect in the future and present, and also, *the future* defines our definition of *the past* as well!

In “The Pain Was Greater If It Will Happen Again: The Effect of Anticipated Continuation on Retrospective Discomfort,” we find the following observation: “Across 7 laboratory studies and 1 field study, we demonstrated that people remembered an unpleasant experience as more aversive when they expected this experience to return than when they had no such expectation” (Galak & Meyvis, 2011, p. 63).

Please note how the past, a memory, was altered as to its affective value due to input about a FUTURE condition. Future, affects the past! So even at a glance, we can see the concepts of past, present and future are not fixed, but are in constant dynamic multi-directional affective contact. Now, I trust all this talk of atemporal events in simultaneous contact seems a bit closer to our intuitive understanding. After all, the various brain regions associated with these "separate" sub-aspects are all wired together

into a single intraconnected system. Perhaps the notions of past, present and future are not so fixed or exclusive after all. Let us next examine this piece of theory, and see if we can find the specific ontological genesis of this unusual idea, and thereby approach the matter more closely:

Cognition and perception comprise the primitive (self-definitive) basis of logic, and logic comprises the rules of structure and inference under which perception and cognition are stable and coherent. (p. 13)
Therefore, the proposed tautology-preserving principles of reality theory should put mind back into the mix in an explicit, theoretically tractable way, effectively endowing logic with "self-processing capability". This, after all, is exactly what it possesses in its natural manifestation . . . (p.14)

The onto-genesis of the logical facility: mechanisms and implications for existential self-referential constancy.

The above statement in the CTMU seems inexplicable. How can logic be self-processing, and if logic is an entity which arises out of the system itself as logic must, being as this is a closed self-referential paradigm, exactly how is this accomplished, what are its consequences for systemic and perceptual stability, and, what other implications might we then draw about the system itself from observing its initial form and mechanism of self-configuration?

This matter is expressed in the most clear and intuitive terms in the discipline of psychoanalysis. We can see, in the development of the infant, the self-configuration, the self-processing and initial creation of binary logical forms in response to the mental system itself being immersed in experience (Freud, 1900, p. 565-566; 1911 pp. 218-219; 1920). The infant has experienced a satisfaction, it has fed. Now it is hungry again. It has a mnemic impression of feeding, and seeks by way of perceptual "regression," to reproduce the image in hallucination. This situation proves unsatisfying to the infant, who then seeks to remedy the situation in reality, and holds the image of feeding and its attendant hallucination away from his mind so as to find a new relationship with the world, and seek not just the revival of a memory of satisfaction, but to achieve that satisfaction *in reality. The reality principle* (Freud, 1911, p. 219) is thusly founded. Here, we can see logic, the ability to distinguish between the real and the unreal, logic itself is created from the somatic and mental systems emersion in experience, and by way of systemic feedback, the unreal, the hallucinatory, is deemed unworthy of belief, as the pain and discomfort of the unsatisfied hunger drive are not met by the unreal, the real obtains a clear priority and precedence, and its identity is soon rightly distinguished from that of the hallucinatory and unreal. So developmentally, we may conclude that *logic is self-configured, self-created from within the psycho-somatic system itself as a function of memory, interacting with experience, mediated through feedback with the neural mechanisms of pleasure and pain.* The result is a very particular and specific mental process of prioritization and rejection where a piece of *wishful experiential content originating internally*, a wishful hallucination, *is held away from consciousness*, the regression left incomplete, maintained at the stage of a mnemic image rather than an hallucination (Freud, 1900, p. 566), and another: *reality*, is thereby given precedence in consciousness. This holding away of an ideation from the conscious is a fundamental psychical dynamic which has many implications we will soon articulate. This automatic restriction of conscious ideational content is called *repression*, and it is the cornerstone of mental functioning and balance. Here, we see the very first fundamental *core* of repressive function which will approach its fruition with the creation of the super-ego in later development. Freud (1915) used the term repression to denote a defensive function responsible for creating much of the unconscious, repression: *"turning something away, and keeping it at a distance, from the conscious*" [his italics] (Freud, 1915, p. 147). The unconscious, houses repressed wishes and other unserviceable, ego-dystonic and painful content, as well as our phylogenetic impressions and many aspects of

personality of which we are unaware.

Now these statements from the CTMU should be accessible to all:

Through telic feedback, a system retroactively self-configures by reflexively applying a "generalized utility function" to its internal existential potential or possible futures. In effect, the system brings itself into existence as a means of atemporal communication between its past and future whereby law and state, syntax and informational content, generate and refine each other across time to maximize total systemic self-utility. This defines a situation in which the true temporal identity of the system is a distributed point of temporal equilibrium that is both *between* and *inclusive of* past and future. In this sense, the system is timeless or *atemporal*. (p.6-7)

To put it another way: if the "noumenal" (perceptually independent) part of reality were truly unrelated to the phenomenal (cognition-isomorphic) part, then these two "halves" of reality would neither be coincident nor share a joint medium relating them. In that case, they would simply fall apart, and any integrated "reality" supposedly containing both of them would fail for lack of an integrated model. (p. 23)

Please note how the infant's logical deductive facility is an *emergent property* of the system as it self-configures, poised as it were, between past ideation, present condition, and future expectation, so through simultaneous feedback amongst the full temporal spectrum, mediated via the systemic functions of pain and pleasure, the process creates a unified conscious utilitarian reality, and the exact picture spelled out in the CTMU is formed.

In the CTMU we read: In CTMU cosmogony, "nothingness" is informationally defined as zero constraint or pure freedom (*unbound telesis* or *UBT*), and the apparent construction of the universe is explained as a self-restriction of this potential. (p. 27)

I propose, as illustrated above, that ontologically, repression is the means through which this self-restriction of unbound potential is achieved. To understand the implications of this statement, we must delve into the process of telic recursion itself, define its components, results, and the dynamic cyclical processes implied. From this vantage point, we may then be able to divine the most direct route, to demonstrate via empirical and linear methods, the existence and affective dynamic of this self-referential and circular theoretic construct.

Telic recursion—the lower structures: Unbound telesis, the primary process and the atemporal mechanics of unconscious operation.

I will uncover the psychodynamics of the telic recursive process by way of topographical dissection. Firstly, the reader will please take careful note of the above statements from [pp. 6-7; p. 27] of the CTMU and the following:

Inasmuch as science is observational or perceptual in nature, the goal of providing a scientific model and mechanism for the evolution of complex systems ultimately requires a supporting theory of reality of which perception itself is the model (or theory-to-universe mapping). . .

. . . the universe refines itself from *unbound telesis* or *UBT*, a primordial realm of infocognitive potential free of informational constraint. Under the guidance of a limiting (intrinsic) form of anthropic principle called the *Telic Principle*, SCSPL evolves by *telic recursion*, jointly configuring syntax and state while maximizing a generalized self-selection parameter and adjusting on the fly to freely-changing internal conditions. (Langan, 2002, p.1)

Conspansion describes the “alternation” of these units between the dual (generalized-cognitive and informational) aspects of reality, and thus between syntax and state. This alternation, which permits localized mutual refinements of cognitive syntax and informational state, is essential to an evolutionary process called *telic recursion*. . . the conspansive nesting of atemporal events puts all of time in “simultaneous self-contact” without compromising ordinality (p. 30)

By putting temporally remote events in extended descriptive contact with each other, the Extended Superposition Principle enables coherent cross-temporal telic feedback and thus plays a necessary role in cosmic self-configuration. Among the higher-order determinant relationships in which events and objects can thus be implicated are utile state-syntax relationships called *telons*, telic attractors capable of guiding cosmic and biological evolution. (p. 31)

It follows that the active medium of cross-definition possesses logical primacy over laws and arguments alike, and is thus pre-informational and pre-nomological in nature…i.e., *telic*. *Telesis*, which can be characterized as “infocognitive potential”, is the primordial active medium from which laws and their arguments and parameters emerge by mutual refinement or *telic recursion*. (p. 35)

The Telic principle simply asserts that this is the case; the most fundamental imperative of reality is such as to force on it a supertautological, conspansive structure. Thus, the universe “selects itself” from *unbound telesis* or UBT, a realm of zero information and unlimited ontological potential, by means of *telic recursion*, whereby infocognitive syntax and its informational content are cross-refined through telic (syntax-state) feedback over the entire range of potential syntax-state relationships, up to and including all of spacetime and reality in general. . . the Extended Superposition Principle, a property of conspansive spacetime that coherently relates widely-separated events, lets the universe “retrodict” itself through meaningful cross-temporal feedback (p. 38)

Where the term *telesis* denotes this common component of information and syntax, SCSPL grammar refines infocognition by binding or constraining telesis as infocognition. (p. 43)

While an ordinary grammar recursively processes information or binds informational potential to an invariant syntax that distributes over its products, Γ grammar binds *telesis*, infocognitive potential ranging over possible relationships of syntax and state, by cross-refining syntax and its informational content through telic recursion. Telic recursion is the process responsible for configuring the syntax-content relationships on which standard informational recursion is based; its existence is an ontological requirement of reality. (p. 44)

At first glance, these many statements seem arbitrary and quite impossible, but, as one discovers the ontological source of these "paradoxical" notions and concepts, their truth, the reason they are so deeply hidden and why their dynamic is so impossible to detect, become manifest. So what are we to make of notions such as the atemporal interconnectivity of *unbound,* unconstrained and *primordial information,* which is both *unavailable to consciousness*, is "nothingness," and also, is the *source of all infocognitive potential*? What is meant by *unbound information which is atemporal?* How can our ontological universe, our reality "retrodict" itself through cross temporal feedback, and how does this, *in the sphere of the neurological and ontological,* translate into precise processes which yield this alternation between *"syntax and state,"* whereby the *universe is defined*, and even evolves by way of telic attractors called telons?

To fit these many ideas into a physio-ontological unity, we might best begin our search in the pages of

depth psychology, for it is here that these patterns find clear and tangible expression. As one might well expect in any proper theory which demonstrates connectivity between the cosmological and the ontological, the patterns of mental construction and dynamism, both conscious and unconscious must be accounted for, and defined. Cognitive neuroscience has much to offer, but it is like the scientists who conceived her: this paradigm is logical and linear. It will, of course, uncover linear truths about cognition. These are useful and valid truths, truths about the exact brain regions which are used to process and recognize places, the so-called parahippocampal place area, or faces, the so-called fusiform face area, or potential tools in the left ventral premotor cortex (Gazzaniga, 2009 p. 235, 519; Gerlach et. al., 2002; Kellenbach et. al., 2003), and a host of other fascinating and valuable pieces of information spanning many areas, including social cognition (Gazzaniga, 2009, pp. 599-633). However, I propose that we often miss the underlying point of cognition to look at it in a linear fashion, and indeed, all of psychoanalysis is based on the assumption, proved countless times in the demonstration of psychoanalytic therapeutic efficacy, that mental processes are predominantly non-linear, that is, predominantly *associative and defensive* in nature. In keeping with the language of cognitive neuroscience, I will refer to the combined associative and defensive functions in their conscious and unconscious composite, as: *non-linear cognition.*

Non-linear cognition has been the cornerstone of effective psychoanalytic practice, and is best understood by way of contrast to linear, logical cognition. In free associative technique, we discard the linear, and find the underlying processes of the mind, which are associative and defensive in nature, then become available to us. From *The Interpretation of Dreams*:

"We must aim at bringing about two changes in him: an increase in the attention he pays to his own psychical perceptions and the elimination of the criticism by which he normally sifts the thoughts that occur to him." (Freud, 1900).

We discard the logical and inhibitive restrictions of analysis and higher mental functioning, and are rewarded with a chain of associations which at their final end, pierce the associative [and compromise censorship/distortion with conscience agencies (Freud, 1900)] defenses, to yield the hidden meaning of a symptom, and/or, reveal its contributing determinants, that is, those topics and ideas which in combination give the notion its affective force and meaning. This demonstrates the "primary process" and other rules describing unconscious organization and dynamism, in action. The primary process and other descriptive rules of unconscious operation, which are associative and non-linear are:

"The cathectic intensities [in the *Ucs.*] are much more mobile. By the process of *displacement* one idea may surrender to another its whole quota of cathexis; by the process of *condensation* it may appropriate the whole cathexis of several other ideas. I have proposed to regard these two processes as distinguishing marks of the so-called *primary psychical process*." . . . "exemption from mutual contradiction, primary process (mobility of cathexes), timelessness, and replacement of external by psychical reality" (Freud, 1915e, p. 186-187).

I will refer to these rules and descriptions of unconscious operation as *associo-cognition.* Associo-cognitive processes and associo-cognitive ideational content are unconscious. Hence, they are not, under ordinary circumstances of health and systemic operation, available to observe. These processes are only available to see in dreams and symptoms of illness, once those have been subjected to interpretation, as well as slips of the tongue and other circumstances where our linear facade gives way to reveal, if only for a moment, the primary associo-cognitive underpinnings which form the basis of conscious, logical, cognitive-potential, and provide the affective structuralization and *quality* of all experience. (I will support these last ideas in the next section).

Please note the similarity between the idea of unbound telesis, and, the associo-cognitive (unconscious) processes: Both are timeless, associative (remote events in *extended descriptive contact*), unbound (the primary process), and unreal. Please remember our infant who replaces external reality with a piece of hallucinatory wishfulness, and hence demonstrates other than logical thinking by replacing external with psychical reality. In failing to distinguish a piece of unbound telesis, an hallucination, from reality, the infant is not meeting the ontological and existential requirements of the working, closed, self-defining system, and hence, is rewarded with pain. Soon he learns to keep unbound telesis unconscious (repressed), or, he will likely develop into a schizophrenic! So we can see the apparent contradiction and paradox in statements proclaiming unbound telesis to be both the source of all infocognitive potential, and also, to be "nothingness," are more sensible than appearances might first imply, although how unconscious and unbound ideational content are somehow a source for all potential is still obscure. To further sharpen these ideas and fit them into our coherent and specific psychical and physiological system, we must traverse a vital side avenue and connect together a few ideas about affect, reality, unconscious and conscious operations, symbolic transference and construction, and so, complete the interactive dynamic connecting the upper and lower topographical structures of the telic recursive processes.

Telic recursive dynamism—From wish to world: Dreaming, symbolism as qualitative definitional transference, reality and "the system of affective assignment."

In order to rightly fit the ideas in the CTMU into a known psychical topography and dynamic, it is necessary to enumerate some old ideas from depth psychology, and relate them to some newer ideas in cognitive neuroscience, by way of a bit of new psychological theory. So please be patient, for this elliptical pathway will soon enough yield the prize, and we will then be in a position to grasp the notions of telic recursion and unbound telesis firmly in hand, and finally, outline our linear empirical approach to substantiate the existence and function of the ontological aspects of this closed, self-defining and self-referential circular tautology.

The system of affective assignment: We only experience our perceptions, never the fictional, factual, "thing in and of itself." Perception is never directly able to access the things and events to which our perceptions refer. These perceptions must be identified, and, affectively interpreted, that is, given an emotional context by virtue of which they can be assessed, and appropriate behavior determined. Therefore, one could say that reality testing consists along with object identification, with the giving of proper symbolic value, proper affective value to perception and experience. These ideas converge to a point. In the simplest terms, what does this experience "mean to you." Think of affect as the psychological context through which a neutral perception is defined. It is the affective meaning, the context, which gives symbolic emotional *Quality* to experience. In example: One person may have a fond adoration for his pet mouse, where another may recoil in revulsion. The mouse is the same, a neutral perceptual experience, it is the affect which we assign to it which puts it in the context of our associated experience that varies. This symbolic affective function can become deranged, as we will now see.

Please recall “The Pain Was Greater If It Will Happen Again: The Effect of Anticipated Continuation on Retrospective Discomfort,” where we find the following observation: “Across 7 laboratory studies and 1 field study, we demonstrated that people remembered an unpleasant experience as more aversive when they expected this experience to return than when they had no such expectation” (Galak & Meyvis, 2011, p. 63). Note how the experience was the same, but the affect assigned to it was different, a function of a *new context* (changed future expectation), whereby a different affective value is assigned to the stimulus. Affect is the context, and so, the quality with which we endow perception and

experience, and its assignment to perception is therefore a vital part of healthy balanced mental function and reality testing.

In Levens and Gotolib's "Updating Positive and Negative Stimuli in Working Memory in Depression," we find the following statements: "Compared with controls, depressed participants were both slower to disengage from sad stimuli and faster to disengage from happy facial expressions. . . . For example, biases against keeping positive information active or toward maintaining negative content in WM may underlie the ease with which depressed individuals develop and propagate a negative mood" (Levens & Gotolib, 2010, p. 654). It is clear that the system of assigning affect to stimulus is essential to reality testing.

The system by virtue of which this process takes place is phylogenetically old and complex. All sorts of affective aspects are undoubtedly stored in various anatomical neural locations and retrieved from these many various areas to create the final effect of "affect." We must watch the system work in a known metapsychological context to identify its various parts and their intrarelations. But, as we study sleep, it seems that with some psychology we may see the system of affective assignment in isolation, and gain some not inconsiderable insight into the process. For this reason I will now draw out the proper Freudian picture of the metapsychology of dreaming so it may be related to the current cognitive neuroscience.

I have found that even the very best scholarly papers often misrepresent Freudian theory by way of drastic oversimplification in order to contrast the theory being advanced against the older established theory. Please read the following from an otherwise superb piece of scholarship. In "The Cognitive Neuroscience of Sleep: Neuronal Systems, Consciousness and Learning," we find the following statement: "Freud believed that dream content was determined by a daytime experience that triggered the emergence of related memories" (Hobson & Pace-Schott, 2002, p. 686). This is an oversimplification. Freud did not state that dreams were primarily dependent on episodic memory as this statement may be seen to imply, but instead, had found many dream sources and relations to day-world experience (Freud, 1900, p. 551). The partial statement of the highly complex and nuanced Freudian theory is so brief as to be utterly misleading. Later in "The Cognitive Neuroscience of Sleep: Neuronal Systems, Consciousness and Learning," on the same page, we find this statement which fits perfectly with the nuanced Freudian theory: "Instead, discrete and incomplete fragments of narrative memory are assembled to create the new synthetic scenarios of dreams" (Hobson & Pace-Schott, 2002, p. 686). It seems that in an attempt to define the new, the old has been distorted. For this reason I will begin with a recap of some familiar psychology which we will need to keep clearly in mind in order to construct our new analysis of affect.

Please note that we have already drawn a clear and intuitive connection between the assignment of affect and symbolism. Note also that our understanding extends this chain of ideas to include the notion of context. They are all but, if not truly, identical ideas, or aspects of each other. In psychoanalytic theory, dream and symbolic construction are accomplished by certain complex and specific means. A piece of day-world residue, a trivial dissociated fragment, a memory trace is chosen as a building block for dream construction because it is neutral, free of affect and meaning, and so becomes ripe for representation in a dream, ready as a canvas to accept the many meanings via transference which will be assigned to it in condensation and "overdetermination" (Freud, 1900, p. 279, 283-284, 563-564). The less saturated with meaning, and, the closer to being a nexus for many other ideas, the better. Language, as it is itself a symbol with many meanings and puns, acts as a nexus to which many underlying determinants can attach in condensation and overdetermination (Freud, 1900, pp. 340-341). The memory trace, and there are of course many which will be assembled to form the

finished dream, is then invested with meaning from many sources. A process of disguise and distortion is used to accomplish this which includes: reversal, condensation of many events into one (Freud, 1900, p. 595), overdetermination of a dream through thematic repetition (Freud, 1900, pp. 283-284) and/or overdetermination of a single symbol by connecting many various trains of thought to give it energetic value sufficient to gain representation (Freud, 1900, p. 330), displacement from one object to another (Freud, 1900, pp. 307-308), and a host of other means which symbolically represent and compound affect to achieve representation and conceal the true source of the affect delegated. These means of affective encoding found in REM dreaming function to avoid censorship via compromise formation which functions to create *distortions* (Freud, 1900, pp. 143-144, 506-508, 595-598). It is by condensed symbolic construction and distortion that the affective sources of the symbol are attached, and also, hidden (Freud, 1900, pp. 506-508). The symbols thusly endowed are then woven into a story, a narrative, and are thereby given further episodic context, although be it a false one, in a process known as "secondary revision" (Freud, 1900, p. 488). The distortions are guided in no small part by the process of compromise formation, where the contents are distorted, censored, so as to produce a manifest dream, the meaning of which, the ego will not recognize (Freud, 1900, pp. 143-144, 506-508, 595-598). The process is called dream work (Freud, 1900, p. 277). So we have the process of symbolic construction and dream representation, a process whereby memory traces with little or no affect become suitable to be endowed with affect and woven into a distorted narrative, through many specific means. Highly complex! However I have tipped my hand as this process can be reduced to a simple but broad quantifiable principle. To discover this quantitative reduction the neuroscience must be analyzed alongside the aforementioned metapsychology of symbolism and dreaming.

In his paper, "Sleep, Learning, and Dreams: Off-line Memory Reprocessing," Dr. Stickgold (2001) and an esteemed collection of intellectual confederates bring us the clearest neurologic picture of this metapsychological proposition to date. A clear neurological definition of the trivial unsaturated pieces of memory (memory traces) and symbolic processes of Freudian theory are seen to emerge in the context of memory consolidation, even if in a schematic and reduced fashion. In certain states of psychopathology such as schizophrenia, we can observe the pathogenic assignment of affect to experience as affective assignment operates unrestrained by the higher mental functions, such as input from the dorsolateral prefrontal cortex, just as we can observe in REM dreaming (Hobson, 2001; Hobson & Pace-Schott 2002; Pace-Schott, 2003). In REM dreaming this unrestrained affective processing is isolated and expressed in harmless hallucination. The isolation of the affective system is achieved through a series of changes in neural modulation which Dr. Stickgold enumerates as:

> "More generally, the cognitive changes seen during REM may be the combined result of three physiological characteristics of REM: (i) the shift in neuromodulatory balance from aminergic to cholinergic, (ii) the decreased activity in DLPFC and increased activity in both the anterior cingulate cortex and amygdala (75–77), and (iii) the decreased outflow of information from hippocampus to neocortex (53). Taken together, these findings suggest that the brain in REM is tuned more for the processing of associative memories than for the simple consolidation of recent memory traces and may explain, in part, various features of REM dreams, including their bizarre, hyperassociative quality (95) and minimal incorporation of episodic memories (96, 97)" (Stickgold, R., Hobson, J., Fosse, R., Fosse M. 2001, p. 1055).

In Dr. Hobson's paper we find the statement nicely summed in these few words: "There is also a progressive decrease in output from the noradrenergic, serotonergic and histaminergic neurons, all of which shut off in REM, leaving the selectively activated forebrain aminergically unmodulated" (Hobson & Pace-Schott, 2002, p. 691). In this instance of systemic aminergical demodulation the

intrarelated symbolic subsystem by virtue of which we give affective value to experience is observable as it encodes affect into a dream during consolidation into the mnemic system, and other various functions I will touch on later:

> "This suggests that the brain sources for dream elements are not hippocampally mediated episodic memories, but cortical traces of discrete components of the episodic memories, which then presumably are combined with associated semantic memories. With dorsolateral prefrontal cortex deactivated in both REM and NREM (75, 76, 106, 107) and the hippocampal formation producing only minimal cortical output in REM (53), actual episodic memories may be inaccessible and hence irrelevant to the dream construction process. . . In REM, the central nucleus of the amygdala plays a crucial role in the activation of medial prefrontal cortical structures associated with the highest order regulation of emotions (76, 108, 109). This adds to the deactivation of DLPFC, normally associated with higher cognitive functions (110), in REM. Thus, the brain appears to be biased toward emotional processing in this state. . . . We hypothesize that these features reflect an attempt, on the part of the brain, to identify and evaluate novel cortical associations in the light of emotions mediated by limbic structures activated during REM. This would be in keeping with the proposed role in waking of these structures in the identification of mismatches between expected and actual behavioral outcomes" (Stickgold et al., 2001, p.1056).

So we finally have a clear beginning in our search for an analysis to discover the neuroscience behind the metapsychology. A memory trace suitable for dream construction is now well-defined as nonhippocampally mediated, and so, cut off from episodic memory just as one would expect metapsychologically, as the memory trace must be free of context and preexisting symbolic and affective value to be able to receive affective, limbic value and emotional definition, and act as a neutral substrate, an unsaturated nodal point with which to provide a new symbolic/episodic context. The source of the affect assigned to these free memory traces which are bereft of saturated context and existing emotive value is found through the mediation of limbic structures. Also, the purpose of these structures in providing affective definition to perception and the influence of this process on reality testing is not neglected either, as we read: "We hypothesize that these features reflect an attempt, on the part of the brain, to identify and evaluate novel cortical associations in the light of emotions mediated by limbic structures activated during REM. This would be in keeping with the proposed role in waking of these structures in the identification of mismatches between expected and actual behavioral outcomes" (Stickgold, et al., 2001, p.1056).

So I can now plainly state the quantitative conceptual reduction to which I have alluded: The symbolic processes by virtue of which we give quality to REM dreams, experience and perception, can be reduced to a quantifiable operation: "the assignment of affect to." Symbolism is a transference from concealed limbic sources, from unconscious sources by virtue of which emotion is mediated and affective quality assigned to perception. Symbolism is a function of the system of affective assignment.

I will now express my appreciation to the reader following my footfall along these vital pathways. We are presently in a position to draw out our parallels whereby the ontology of the CTMU will be revealed, and then, discover the empirical solution. It is surely clear to the reader that the *unconscious limbic sources* affectively compounded by the many processes of symbolic construction so as to provide quality to perception: *are unbound telesis*. Please recall that unconscious processes and material are associo-cognitive and hence, must be repressed, must be unconscious, for the system to self-configure properly. We have also seen that if this process is not adhered to in every respect,

hallucination (and/or aberrant mental functioning) will result, as the existential and ontological requirements for reliable telic recursive function are not met. Indeed, it is by exploiting this very fact, that we will gain entry to empirical and linear demonstration of this closed theory. The CTMU describes the system in proper alignment and operation as it functions smoothly. In this instance, the underlying processes described MUST remain unconscious, as resistances of the most potent sort guard our unconscious content and processes of operation. So, if we are to demonstrate what under ordinary conditions of health are necessarily hidden processes, we must create conditions of imbalance in the system to reveal its otherwise seamless and hidden functioning. Briefly put:

To demonstrate the existence and particular operations of a closed self-referential (tautological) dynamic system which is *unobservable in a state of balance*, one must *introduce imbalance*, aberrance, and in so doing, create distortions in systemic operation from which particular modes and types of functioning can be inferred.

This is the approach which will allow the development of an empirical framework in which to demonstrate and test the CTMU.

To traverse this avenue we require but two things: We must more clearly connect the aforementioned information about the physiology and metapsychology of dreaming and symbolic construction with the theory and language of the CTMU, and offer a few more pieces of information about repressive function and its relation to reality, the transference, symptomatic formation and unconscious unbound telic ideation. With these few steps, we will define imbalance as well as balance in the language of the CTMU, allowing us to interpret hidden unbound unconscious telic processes and specific non-informationally defined ideations and their associated transference distortions in the recursive process, and then, begin to gain an empirical foothold on this elusive theory.

Unisection + interpretation = infocognition.

Syndiffeonic relations can be regarded as elements of more complex *infocognitive lattices* with spatial and temporal (ordinal, stratificative) dimensions. Interpreted according to CTMU duality principles, infocognitive lattices comprise logical relationships of *state* and *syntax*. Regressing up one of these lattices by unisection ultimately leads to a syntactic medium of perfect generality and homogeneity…a universal, reflexive "syntactic operator". (p. 18)

The process of reducing distinctions to the homogeneous syntactic media that support them is called *syndiffeonic regression*. This process involves *unisection*, whereby the rules of structure and dynamics that respectively govern a set of distinct objects are reduced to a "syntactic join" in an infocognitive lattice of syntactic media. Unisection is a general form of reduction which implies that all properties realized within a medium are properties of the medium itself. (p. 33)

By putting temporally remote events in extended descriptive contact with each other, the Extended Superposition Principle enables coherent cross-temporal telic feedback and thus plays a necessary role in cosmic self-configuration. Among the higher-order determinant relationships in which events and objects can thus be implicated are utile state-syntax relationships called *telons*, telic attractors capable of guiding cosmic and biological evolution. (p. 31)

While the ideas of syndiffeonic regression and unisection can be seen to imply a regress which

terminates at the lowest micro-level of the subatomic, the principles are also available to observe at a variety of levels, including the psychological and the psycho-physiologic. As one conducts a unisection of the mental system, at the level of the psycho-physiologic, the sum total of various and often opposing ideational and emotional states are emergent properties of cortical tone created through multi-combinative distributions of a precious few neuro-chemicals. These, through their distribution in various specific ways, correspond psychologically to the libido and its conscious emergent manifestations, which demonstrate their "syntactic join" as they become specific emergent aspects (defined information/emotional and perceptual states and definitions), created of this single homogeneous systemic potential, the "reservoir" of unbound (undifferentiated) libido, at the neurophysiological center of which is the ascending activating system (Kaplan-Solms & Solms, 2002, p. 264-267). At the level of the psychological, I have discovered that each time an unconscious ideation is made conscious then understood through analysis, the result of the analysis is identical even as the ideational structures discovered are oppositional: e.g., if an unconscious ideation of sadism is recovered, and its fixated form disbanded via analysis, or, if a sexual or erotic ideation is recovered and analyzed to release the energies from that fixated form, in both cases, both hateful and erotic cases, the energy released as the fixation is dissolved is identical: undifferentiated libido (Norman, 2011). The homogeneous syndiffeonic energetic substrate is revealed, a homogeneous energetic potential grouped as information, as a specific wish of one sort or another, either hate or love, it matters not—all are but different expressions of a single homogeneous unbound potential.

Please recall if you will, the fact that we are not able to see the repressed, that unbound telesis is "nothingness." In the case of the unconscious mental system this unbound potential which is consigned to repression, consigned to "nothingness," is a most specific and particular sort of ideational potential: wishes and painful ideas of all sorts. These ideas are so erosive to the ego, that although they influence all thought and action, and provide much of the defining quality to perception, they can never be seen. If we defy this rule of ontological stability, and ***allow*** this content into consciousness, reality testing is lost, and (allowing for some compromise formation), **psychosis results** (Freud, 1911) [or the aberrance of perversion (Freud, 1905*d*)]. **Neurosis**, on the other hand, is a symptomatic function of the struggle *to* ***repress*** these wishes. To put the difference between the mechanisms of psychosis and neurosis as they relate to the unconscious and reality (Freud, 1924, p. 150-151), in the language of the CTMU:

The psychotic *replaces* reality in whole or in part, with *conscious* unbound telic ideational structures, much as the neurotic distorts his view of reality by way of *refusing* the proper recursion into consciousness of a piece of (unconscious) unbound telic ideation.

Now we can see the curious middle ground occupied by psychoanalytic practice, which functions as a sort of controlled, informationally constrained psychosis. The ideal goal of psychoanalysis, may be stated as: *all repressions must be undone* (Freud, 1904, p. 253), or, one might say, as Freud (1900; 1904, p. 252) so often did, that psychoanalysis and dream interpretation aim to translate the repressed into conscious terms, and make unconscious ideations, intelligible in our ordinary language of consciousness. So, we can see that a psychoanalysis or dream interpretation are a unisection, with an additional step: interpretation. The result is the translation of what was a repressed idea, an idea unavailable to consciousness, a piece of unbound potential, "nothingness," into an intelligible idea: infocognition.

Unisection + interpretation = infocognition.

That is the equation for psychoanalysis, in the language of the CTMU.

So let us return to the metapsychology and neurophysiology of dreaming and memory consolidation, and interpret these within the CTMU framework. As we conduct our unisection, we find the "syntactic join" available to discern at the points of condensation and overdetermination of the memory trace, (and in the interconnections and context generated between them). Each memory trace, once so unsaturated with meaning, so trivial as to be a perfect receptive nexus for symbolic meaning, is then encoded with limbic (and other) information from multiple unconscious (and conscious) sources. (Remember the part played by the censorship). Once this non-hipocampally mediated (by way of restricted hippocampal output) memory trace has been encoded, it is entered into consciousness as a piece of a dream. The encoded memory trace is added into the mnemic system via memory consolidation in REM and NREM sleep, slow-wave-sleep in particular playing a large part in the hippocampal to neocortical dialogue (Hobson & Pace-Schott, 2002; Stickgold et al., 2001). Here we see a piece of "conspansion," as each night the system expresses in a REM dream, the repressed wishes which correspond to "state," to potential, and unburdens the system, which then alternates during the day, and, *represses* this unbound potential state in the *self-restriction* necessary to achieve the ontological and existential conditions requisite in the formation and identification of reality. But we see more than that: we see the creation of a telon.

Please recall this piece of CTMU theory:

> Among the higher-order determinant relationships in which events and objects can thus be implicated are utile state-syntax relationships called *telons*, telic attractors capable of guiding cosmic and biological evolution. (p. 31)

In the sphere of the neuro-ontological we can see the creation of a telon in the finished symbolic product: the encoded memory trace now so laden with information, a higher order structure, by which I mean densely encoded, a component added into the mnemic system through which we give affective definition to experience, and in the act of its addition to that system, as a highly encoded structure rich in information, it *must* thereby alter the overall affective valence of the system, alter its associative balance in actively reconfiguring the system as a result of the incorporation of this new information. The telon, thusly affects the evolution and future responses of the system, by instantiation of the present (and future) into the past each day in direct additions to the system (Stickgold et al., 2001, p. 1052), and at night as a function of memory consolidation in the form of a deeply encoded memory trace which is added into the neocortex's mnemic store during REM and NREM (Stickgold et al., 2001; Hobson & Pace-Schott., 2002). The most daring and pivotal inference in Dr. Stickgold's paper states: “Such evaluations could then lead to the strengthening or weakening of specific activated associations, providing the functional consequence of REM dreaming” (Stickgold et. al., 2001, p. 1056). Indeed, the consequence of adding an affectively encoded memory to the complete store of total mnemic content can have no other effect! The associative connections for all future affective definition are necessarily altered as the past store of affect by which future experience is defined is altered. Past experience, once added to memory, affects future experience. The shift in unconscious valence caused by memory consolidation must alter the transference through which future experience is given associative quality and definition. I will state: The mechanism through which memory consolidation affects the associations that define experiential quality is through a rebalancing of the mnemic valence which is the unconscious source of affective assignment. In the language of the CTMU: The telon, once incorporated into the system via telic feedback, alters the system's function so it evolves in response and self-configures "on the fly," in accordance to changing conditions. Now we must but detail a final interstitial theoretic nexus where the economic, dynamic, and topographical theory of the unconscious instincts, repression and the resultant transference, coincide with the CTMU, after which, our final empirical destination will be at hand.

The repetition compulsion: recursive modus-operandi, primaeval repression and the unbound—Reality and The Transference.

The Freudian principle of the Repetition Compulsion: Once an instinctual state has been achieved, the instinct to repeat the state becomes a drive: the repetition compulsion. This elasticity which wishes to return to a previous form, this inertia of the psyche, is found as a primary element in the dynamic structure of neurotic symptoms, which in the main, evidence the need to return to, and repeat, earlier states of development, in the present (Freud, 1920, p. 36; 1905). So the first idea is that of the repetition compulsion, by virtue of which early impressions assert themselves from the unconscious to produce behaviors based on the need to repeat those early repressed systemic conditions and states. The unconscious exists in a state of unbound cathexis (primary process). [The idea of bound and unbound in this specific sense were added to the "psychological lexicon" by Breuer and then Freud (Freud & Breuer, 1893-1895, p.194).] Please remember the fact that unbound telesis is *primaeval* information in an *unbound* state, un-informationally constrained and *not* subject to the *reality principle*. Keeping in mind the fact that recursion directly implies that which will reoccur, that which repeats, please note the similarity of wording and meaning between the Freud and the CTMU in the following:

"The patient behaves in a purely infantile fashion and thus shows us that the repressed memory-traces of his primaeval experiences are not present in him in a bound state and are indeed in a sense incapable of obeying the secondary [logical/waking] process. It is to this fact of not being bound, moreover, that they owe their capacity for forming, in conjunction with the residues of the previous day, a wishful phantasy that emerges in a dream. . . At this point we can not escape a suspicion that we may have come upon the track of a universal attribute of instincts and perhaps of organic life in general which has not hitherto been clearly recognized or at least not explicitly stressed. *It seems, then, that an instinct is an urge inherent in organic life to restore an earlier state of things* which the living entity has been obliged to abandon under the pressure of external disturbing forces; that is, it is a kind of organic elasticity, or, to put it another way, the expression of the inertia inherent in organic life" (Freud, 1920, p. 36).

There is moreover no doubt from both reading the Freud, and also, my own extensive researches as to the predominant nature of this primaeval unconscious material, this ontological material in a state of unbound telesis, which is indeed predominantly infantile, and as this period of development spans the entire evolution of the formative infantile component instincts, which form the perversions, we may rightly infer that much of unconscious content, and so, *in the sphere of the ontological*, unbound telesis, is also, perverse in character, that is, made up of infantile component instincts (Freud, 1905; Norman, 2011; 2011a, 2013). Please recall the notion of the transference, which has been touched upon, but inadequately. We have established that a transference of affect takes place in dreams, where the system of affective assignment is observed in unrestrained isolation, forming a transference, facilitating the encoding of affect onto pieces of affectively unsaturated day-world residue, called memory traces, which are trivial, non-hippocampally mediated pieces of non-episodic (not contextually/temporally defined) recent memory. Likewise, we have established that a similar transference of affect aiding reality testing takes place during the day from unconscious mnemic and limbic sources, and in so doing, an accurate definition of reality is formed. This ideal condition, one of *non-pathological transference* (my notion), where the self-restrictive function of repression, and the system of affective assignment are working properly, is not the only case. There is another case, different than the ideal one where the smooth functioning of the system hides unbound telesis in nothingness, different than the ideal where the contents of the unbound unconscious are well repressed to yield their potential without

a trace of disturbance, this ideal condition has a counterpart: mental illness.

In this case, one can see the unbound content working as it distorts the transference, and so, distorts reality. As we have seen this can happen in two general ways, as neurosis, and psychosis. So in neurosis, in an attempt to keep a component instinct repressed, the transference becomes distorted, as the instinct works to circumvent the repression via the repetition compulsion, and in its influence alters behavior and reality testing, resulting in symptoms. The level of repression, to a great degree, in the transference neuroses, determines the sort of symptomatology presented. In the case of the more transparent neuroses, such as hysteria, repressive function is quite low (Freud, 1915, pp. 181-185). The perverse ideation works from the unconscious to affect the transference pathogenically, and in neurosis, it is so very often just such a piece of perverse unbound telic content which is the source of symptoms, yielding the Freudian axiom: *The neuroses are, so to say, the negative of perversions* [his italics] (Freud, 1905, p. 165). The meaning is is both unpleasant and clear: There is a perversion, a fantasy or memory, which is dynamically active in the unconscious, an "unconscious positive," an active unconscious ideation (Freud, 1905; 1912, p. 261) causing the symptoms as it distorts and influences the transference. Now we are in a position to summarize the general approach to a linear empirical framework whereby the circular self-referential CTMU might be tested.

First please recall the aforementioned statement:

"To demonstrate the existence and particular operations of a closed self-referential (tautological) dynamic system which is *unobservable in a state of balance*, one must *introduce imbalance*, aberrance, and in so doing, create distortions in systemic operation from which particular modes and types of functioning can be inferred."

I propose to do just that, as we introduce aberrant conditions into the system's vital and sensitive atemporal recursive dynamic structure and balance, and thusly, alter its function in measurable ways which will allow us to infer by deductive analysis of the distortions created, the existence and function of those dynamic systemic processes and content, which are normally concealed. First, I will elucidate the degree to which this goal has already been approached in the realm of cognitive neuroscience, and then, offer up some general and approximate experimental constructions in order to outline the approach which appears most fruitful, by which we might traverse the gulf between the tautological self-referential CTMU, and, the linear, demonstrable result which science requires.

Interruption in telic feedback of present into past, and measurable distortions of future performance.

The theory of memory consolidation is a new and interesting theoretical development spawned within the context of a rigorous scientific spirit, and the trustworthy verifiable standard of experimental construction, which typify the academic rigors of cognitive neuroscience. One clever approach to uncovering the mysteries of REM dreaming and memory consolidation, uses a textural discrimination task and specific sleep stage interruptions as the basis for its inferences (Karnie et al., 1994). As we have established, each night in REM dreaming and NREM sleep, affective information necessary for reality testing (and hence certain types of task performance) is encoded and consolidated into the mnemic system, that is, in the temporal sense: the present (and future ideations) of conscious life, are added into the past, added into the neocortical mnemic store. This temporal feedback from present to past, according to the CTMU, is necessary for those systemic "on the fly" adjustments which allow for self-regulation of the closed system. Hence, if we interrupt this piece of the telic recursive process, interrupt the addition of the present into the past, the system's future performance will be compromised.

This is exactly what we see, as a selective interruption in REM sleep, removes the advantage of training in task performance, if REM interruption is induced during the night after training. Interruption of REM the night before administering a test for a task *previously* learned (and properly consolidated with no REM interruption), had no deleterious effect, isolating the variable of REM memory consolidation, that is, instantiation of the present into the past, as necessary for future task performance improvement after training. Interrupt tecic recursion and the system demonstrates distorted performance. Ergo: telic recursive processes and feedback are necessary for maintaining optimum evolutionary responsiveness, by allowing automatic adjustments of systemic conditions in response to environmental input. So we have an initial empirical foothold *already established* which offers no small measure of preexisting support for the theoretic ontology of the CTMU, as we see measurable distortions, relative decreases in system performance emerge, through interruption of this piece of the telic recursive cycle, and can infer its function, now revealed as a necessary self-regulating adjunct to the evolving dynamic system.

The empirical trajectory—the intrasystemic and unconscious stressors, affective assignment and repressive function distortion: the system revealed.

A brief word about the general experimental constructions which follow is in order. The experimental methodology utilized here is a form I first created to clarify the complex quantitative data which emerges upon analysis of neuronal systems, in a paper entitled, *The Quantitative Unconscious: A Psychoanalytic Perturbation-Theoretic Approach to the Complexity of Neuronal Systems in the Neuroses*. This psychoanalytic approach, which is part physics and part metapsychology, is known as *intrasystemic perturbation theory.* When applied with a medical end in mind, this theoretic framework will yield a solid and particular quantitative template, against which mental illness can be objectively assessed, and identified. In turn, the method will also allow what only much time and psychoanalytic work have been able to uncover by analytic inference: a typological identification of the actual unconscious content which is producing pathology. Although the CTMU is not a psychological theory in the pure medical sense, and no definitions of illness or approaches to cure are promoted within its province, the core of mental functioning is rightly represented in its pages, and so, it is provable by these means.

The theoretic approach, know as perturbation theory, finds primary expression in the classic example of determining the motion of the earth through our solar system, but has many applications in physics, including string theory (Greene, 1999, pp. 289-294). I propose that we can use this perturbation-theoretic approach to interpret the complex data emerging in quantitatively defined mental functioning. Instrumental efficacy is the basis of scientific reliability and usefulness (Boyd in Hempel (Ed.), 1983, p. 84). To find our approximate substitute prediction, we have not far to look, as psychoanalysis, in its curative influence, has been instrumentally demonstrable for over one hundred years. It is through the judicious application of metapsychological acumen that the transference structure is altered, and neurosis curatively affected through psychoanalysis, so, it is metapsychology which will act as our substitute approximate prediction to define mental functioning. By constructing experiments which by their design metapsychologically define the super-complex dynamism of mental operations which we observe as (quantitative) intrasystemic patterns of dynamic neuronal activity, that complex data is thusly defined and simplified, its purpose becoming preemptively intelligible, the data defined as to its function even before its collection, now performing familiar metapsychological roles and psychical functions, which we well understand.

An application of intrasystemic perturbation theory to the system of affective assignment:

Although much work in cognitive neuroscience has been accomplished regarding the affective value assigned to facial expression (Adolphs & Tranel, 2004; Blair et al., 1999; Killgore & Yurgelun-Todd, 2004) and a test like the 1NT which clearly demarcates affective assignment exists, the 1NT does not separate the variables of repression and affective assignment, and, affective assignment is not limited to the assignment of affective value to social groups or faces alone, but endows all of human experience with symbolic and qualitative valence. Think of the previous discussion about affective, contextual and symbolic assignment to our neutral perceptual experience: e.g., One person may look upon a barren desert landscape and see beauty, another may see a desolate expanse most ugly and uninviting. For this reason the following test should be constructed:

One has the subject look at a series of faces and scenes, each with a distinct affective element, or no such element: i.e., some faces are negative, some positive, some neutral, just as the scenes of cityscapes and nature, etc. As each person has individual prejudice and different affective definitions for *all* stimulus, this first test is a baseline marker for that subject. (The addition of a personality inventory and/or test for neuroticism at this point will provide a basic snapshot of personality type and its correlation to affective assignment, and further clarify the results). The subject must be well rested, and will respond to each stimulus and categorize the affect they have assigned to that stimulus by indicating an affective category along a continuum: Loving, Friendly, Kind, Neutral, Hostile, Hateful, etc. Each response is timed and recorded. This is the baseline for affective responsive function. Now the subject has some single specific aspect altered which we suspect correlates with affective assignment, like *deprivation of REM*, since REM, as we have theorized, is the model of affective assignment and symbolic function, and therefore, may well be involved in properly rebalancing the system of affective assignment each night as a metapsychological function of the expression of a repressed wish (Freud, 1900), and analogously in the language of cognitive neuroscience, through the encoding of the affective component of experience into a REM dream indicative of neural processing (plasticity), and consolidation into the overall mnemic system, a process which also involves NREM/ slow-wave-sleep (Stickgold, et al., 2001; Hobson & Pace-Schott, 2002).

In the language of the CTMU: We will introduce aberrance into the self-defining system by disturbing the conspansive alternation between syntax and state. This is accomplished by way of preventing the encoding and addition of a telon into the evolving system, through *interruption and curtailment* of the cross-temporal feedback and simultaneous dynamic interconnectivity of the present (and future) with the past—a state of simultaneous atemporal interconnectivity necessary to support present instantiation into (the mnemic substrate of) the past. The result should be: *an empirically discernible reduction in future system performance and reality testing.*

So, if the hypothesis correct, we will have demonstrated a correlation to be present, as performance of the system of affective assignment will be altered for the worse after REM deprivation: the responses will take longer, demonstrate inefficiency and other *possibly pathological alterations* from baseline. Affective assignment has now been isolated from repression, and a correlation of specific and causal relation has been established.

Next, as the intrasystemic stressor (REM deprivation) has been causally linked to affective assignment, the entire test is repeated in an MEG, fMRI or PET, and the information gathered in the two images compared, one at baseline, one stressed. The system is thereby defined, and understood in context. One can observe the limbic activity and any other mediating affective structures, the particulars of which need not be predicted, but are rightly understood to be observed in operation, as the function

they serve is known before the data that function defines is collected: *Here we are observing a distortion in the transference which provides affective definition to reality and perception.* This distortion in the transference, is a distortion in reality testing, and is evidence by way of aberrance, a clear decline in systemic performance *which is directly linked* to the smooth and efficient operation of the atemporal recursive processes, upon which reality itself is a dependent, emergent property.

An application of intrasystemic perturbation theory to the system of overall repressive function:

Current research into the topic has approached this metapsychological cornerstone, repression, from various ancillary perspectives, ranging from the Pavlovian mathematical modeling and experimental determination of the neuropharmacology associated with SSRI therapy and the suppression of aversive predictions (Crockett et al., 2012; Dayan & Huys, 2008; Huys, et al., 2012), to the resource-depletion framework of task aligned/misaligned cognitive functioning (Storbeck, 2011), or the optogenetic activation of individual brain circuits and structures such as the amygdala, which mediates anxiety, and is sure to have a role in repression (Deisseroth et al., 2011, p. 362; Freud, 1926; Norman, 2010, 2011). Indeed, there are a great many particular neural structures, including the orbitofrontal and inferior regions of the PFC and others, that promise to hold some individual part in the cooperative anatomical conglomeration which must work smoothly together so as to achieve the delicate and appropriate result of proper repressive functioning, which is so crucial to maintaining mental stability and balance (Norman, 2011; Ovaysikia et al., 2011, p. 2.; Shimamura, Marian & Haskins, 2012, p.1). If we are to understand the purpose of the complex and dynamic patterns of information as expressed over active brain anatomy, these patterns must be analyzed in terms of the instrumentally demonstrable metapsychology which they represent, and so, allow us to discover their purpose, and unearth the relative simplicity, the "intention" of those informational patterns of activity as they are made manifest in their operation, now clearly serving to contain the familiar quantitative and qualitative conflicts endemic to mental functioning.

In his 1915 paper on repression Freud wrote that, "*the essence of repression lies simply in turning something away, and keeping it at a distance, from the conscious*" [his italics] (Freud, 1915, p. 147). As the Stroop task works to achieve its effect through the separation and suppression of some ideational elements, and the conscious selection and representation of other intermixed pieces of information, it can be recognized as a well established test rightly aimed at the repressive facility.

We first establish a baseline, and administer a Stroop test suitable for use in a scanner with no stressor. The responses are timed.

Next, the subject is rested, and an unconscious stressor using images spanning the full breadth of polymorphously perverse unconscious ideation is administered, and the Stroop test repeated. As the ego dystonic images from the stressor take effect, the unbound fantasies that correspond to them in the unconscious are encouraged, and made active, just as a dream wish *may* be triggered by day-world experience (Freud, 1900, p. 551). We can, of course, predict a reduction in the efficiency of response times due to stress of the repressive system. In addition, the method goes well past this causal inference which is akin to much of ordinary experimental psychology, in allowing us, via a quantitative scan, access into the neuro-dynamism which creates the causal connection we have found. With the addition of this targeted metapsychological stressor, aimed directly at the sort of unconscious content that is so often pathogenic, one knows psychoanalytically what the quantitatively revealed system is doing, and can look at the complex information gathered in the context of a known metapsychological function, and hence, discover the relative simplicity of intentional informational exchange, represented

in intrasystemic patterns of dynamic activity spanning active brain anatomy—which are now revealed and understood in a functional context of known operation. Now it is clear what familiar thing we are looking at: *the repression of a perversion as it affects the transference*, and so, the complex quantitative information collected is understood as to its purpose and function, even before it is gathered.

In the language of the CTMU: By introducing a condition of aberrance which will add stress to the mental system's *means of self-restriction*, an artificial condition of imbalance is created, where a piece of ontological unbound telic content is encouraged in its energetic potential, much akin to the topographical tensions contributing to a neurosis, introducing into the necessary and delicate balance of the closed self-defining system whereby reality is created, a distortion. This distortion will allow us to observe the normally quiescent system in a state of imbalance which will make its hidden operations and mechanics available to us by way of deductive inference. In this case we can infer: There is a delicate balance between unbound systemic potential and the self-restriction (repression) of that potential, which if altered or stressed beyond certain limits in capacity, will evidence empirically demonstrable reductions in systemic efficiency.

Conclusion:

Christopher Langan's CTMU is a theoretical nexus which fuses the ontological and the cosmological under a single paradigm. This paradigm is structured as a circular self-referential tautology, which seems to admit no linear empirical proof. However, the CTMU is built around a clear representation of the psychology of human mental processes, processes both conscious and unconscious, and so, is best described by depth psychology. Indeed, the patterns represented in Freudian psychology are deeply akin to those in the CTMU. The result of this demonstrable parallel will allow extension of a neurological and psychological formulation of the CTMU which includes imbalance and aberrance, as well as unity. In this instance, the system is no longer inaccessible to linear assessment, and experimental designs can be constructed. Cognitive neuroscience has already tread this pathway to no small degree, and trustworthy confirmation of the basic ideas around which the CTMU finds ontological purchase, is already at hand. In the sphere of the ontological, resolution of the matter seems to be within reach. All that remains is to complete the picture. The CTMU does not claim under its province the specific realm of the medical and psychological, and can not treat an illness, nor is it designed to do so. Its promise and worth lie elsewhere, in providing a unification of that which appears to us as divided. So, but the physics remain. Mr. Langan's genius is not disputed, and what of the task remains is now equally clear: A clear, repeatable, linear experiment, both tangible and mathematical, designed to demonstrate the connection between the proposed malleability of the laws of physics, and their resultant plasticity under the influence and sway of thought. To a man of such height, no lesser challenge will do.

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