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Relations between the Signifying System and the Neural System: Ψ, the Signifying System, and Recent Neuropsychoanlytic Findings

(a preliminary draft)

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The objective of my 2003 project is to do preliminary research on the soundness of my hypothesis that the Freudian and Lacanian theories of the unconscious and the signifying system pinpoint a "missing and missed link" in the neuropsychological accounts of the mental mechanisms. This hypothesis has been confirmed. A crucial link is both missing and missed because it is processed in highly paradoxical ways. As having been promised, follow-up studies will be undertaken to explicate the mental phenomenon, and eventually to be used to support studies on postmodern cultural phenomena. The following is a preliminary draft of part of the findings obtained from last year's study.

1. The Solmses' Findings

Karen Kaplan-Solms and Mark Solms's studies combining neuroscience and psychoanalysis have succeeded in identifying what Freud calls the "nucleus of ψ" as the ventromesial frontal cortex. The studies are done according to A. R. Luria's methodology. This Russian psychologist, following the Freudian track, "modified the classical clinico-anatomical method to accommodate the essentially dynamic nature of the mental process" (Kaplan-Solms and Solms, 2002, p. 39). The Solmses sees this as the breakthrough Freud himself considered to be necessary for a reunion of psychoanalysis and neuroscience. And applying Luria's method of "dynamic localization," the Solmses, as described in their *Clinical Studies in Neuro-Psychoanalysis* (2002), attempted psychoanalyses of the symptom-complexes caused by local brain lesions of different sites. In this way, they are able to produce convincing descriptions of the mind-body structures underlying syndromes. In the following, I will focus on the parts related to the Freudian ψ system.

Kaplan-Solms and Solms's analyses show, damages to the ventromesial frontal cortex lead to different degrees of psychosis. Such patients present almost completely disinhibited cognition and behavior, which the neuropsychoanalysts find to match Freud's description of the primary process (i.e., the functioning mechanism of the primitive mind). For the ventromesial frontal patients, the real and the imagined, the present and the past, the external and internal are all intermixed and equalized. To add an economic description to the analysis (which the neuropsychoanalysts failed to do and which will, as the following discussion shows, adequately explain the perplexing cases of their right cerebral hemisphere patients), we can say that in the mental

apparatuses of such patients, all the memory traces are now fully re-cathected with energy quantities of the levels of the φ (perceptions) and ω (consciousness) systems, whose psychichal representatives (imagery or words) are cathected with energies of much higher levels than what there are in the unconscious, which Freud calls the ψ system. The latter, the unconscious, has in the cases of the ventromesial patients been abolished and now all the mental indications, no matter whether they are of the past experiences or purely imaginary, are equally and fully cathected and thus produce hallucinations and delusions.

Since this type of phenomenon emerges because of ventromesial frontal lesions, the obvious conclusion, which the Solmses have arrived at, is that this brain region exerts the function of inhibition or, as Freud calls it, the secondary thought process. This function can be severely obstructed or nearly completely obliterated owing to ventromesial frontal damages. But what is the structure of the larger ψ system, or the relationship of the nucleus of ψ with the related parts of the brain? This can be inferred by comparing the Solmses' analyses of other types of brain lesions and Freud's scheme.

The Solmses' findings concerning damages of the right perisylvian cortex are especially interesting in this regard. The right-hemisphere syndrome is found to be characterized by the various disorders of spatial behavior and cognition. These spatial disorders are coexistent with mental disorders showing fundamental disturbances concerning the body, self, and self-other relationship. These patients treat their paralyzed left limbs in extraordinary ways. Some ignore them, some claim vehemently that they are okay, and some get obsessed with them and even harbor strong hatred for them. They treat their self and the people around them in similar ways. Their mental states, the Solmses point out, correspond with Freud's description of hypochondria, melancholy, and narcissism.

The Solmses contend, the right perisylvian cortex, which is in charge of concrete information of space, is the brain region that generates perception or cognition of the whole-object; it is "a crucial component of the neuroanatomical substrate of whole-object representation, and therefore a neurophysiological vehicle for whole-object cathexes and the capacity for mature object love" (197). The collapse of the spatial relationships inscribed in this region would make "external object cathexes collapse back into the ego" (196) and result in what Freud calls narcissistic diseases (e.g., paranoia) and their reverse forms (e.g., severe depression), which the Solmses have in fact discerned in their ventromesial patients.

The foregoing conclusion has been reached by stringing together subtle symptoms, other neuroscientists' hypotheses, and the Freudian theory. Although I find the reasoning illuminating and the conclusion largely acceptable, I nevertheless see

some significant gaps in them. And I find the bridging of these gaps to be of paramount importance for our understanding of the Freudian theory as well as of some structuring and functioning rules of the human psyche.

The Solmses draws support for their argument from an experiment conducted by V. S. Ramachandran in 1994 which confirmed an observation first reported by Bisiach, Rusconi, and Vallar in 1991. Ramachandran administered ice-cold water to the left ear of a right perisylvia patient, Mrs. M, whose syndrome included dense hemineglect (neglect of the left-hand side of space, especially her paralyzed left arm) and profound anosognosia (a near-delusional disavowal of her disease). This treatment succeeded in making Mrs. M temporarily conscious of her physical deficit. Ramachandran concluded that

> *the information about the paralysis was being continuously laid down* in her brain, i.e., the denial did not prevent memory … we may conclude that *at some deeper level she does indeed have knowledge about the paralysis*…. The remarkable theoretical implication of these observations is that memories can indeed be selectively repressed…. Seeing [this patient] convinced me, for the first time, of the reality of the repression phenomena that form the cornerstone of classical psychoanalytical theory. (Quoted in Kaplan-Solms & Solms, p. 158, emphasis added by the Solmses)

The Solmses confirm Ramachandran's diagnosis with their analysis of another right parietal patient's symptoms, which include a severe right-hemisphere syndrome, especially hemineglect, and an extreme form of narcissism, an almost total oblivion of the things around him that do not concern his own well-being. This patient, Mr. C, had a peculiar behavior. "Every now and then, and for no apparent reason, his face would suddenly crumple, and he would either burst into tears for a brief moment, or he would look as if he were about to burst into tears before rapidly finding his composure again. The whole episode would be over in a flash, forming a curiously incongruous contrast with his more pervasive attitude of invulnerable, narcissistic superiority" (Kaplan-Solms & Solms, pp. 164-165). And Mr. C, once when tactfully led by the therapist in the analytical situation, confessed in lucid language his worry about the lack of improvement of his paralyzed left arm. "Then Mr. C was silent for a long while, whereafter he reverted to his usual, apparently indifferent state" (Ibid. p. 166). The explanation the Solmses give to this incident is that, the intervention of Mr. C's psychotherapist had the same effect as Ramachandran's caloric stimulation.

> They momentarily overcame the patient's resistances and enabled him to

> face squarely the facts that he had until then been strongly disinclined to acknowledge…. *These patients are indeed continuously encoding information about their defective bodies*, *and at some deeper level they do indeed have knowledge about their handicaps and the emotional implications thereof*. All that they lack is the capacity – or, as we are suggesting, the inclination – to attend to this knowledge, to permit it to enter conscious awareness. (Ibid. p. 167, emphasis added)

This explanation looks curious; it is not in full accordance with the psychoanalytic theory, which postulates that a piece of unconscious knowledge, once made conscious, especially through the words of the person in question, will as a rule remain conscious and become open to rational influences. Herein lies the basic principle of Freud's "talking cure." Mrs. A's and Mr. C's lucidity, on the contrary, were momentary. Mrs. A's lucid utterance appeared only when she was under the brief influence of the caloric stimulation; and Mr. C, in the same therapy session in which he spoke of his worry about his paralysis, reverted to his usual indifference. Both of them are in some aspects shrouded in a near-schizophrenic apathy. Apparently, neither can be said to be appropriately responsive to psychoanalytic interventions. Such patients, to follow the Freudian nosology, shouldn't be diagnosed as neurotics, as the Solmses do; instead, they should be classified as psychotics and put in the same camp as the Solmses' ventromesial frontal patients whose "nucleus of ψ" has been found to be severely disturbed.

3. Repression and the Return of the Repressed

More fundamentally, the Solmses' explanation seems to reveal a misunderstanding of the Freudian mechanism of repression. The Solmses use the term "repression" strictly in the negative sense, meaning the abnormal, pathological, regressive mode of keeping some knowledge from entering awareness, whereas the term "inhibition" refers to the positive form of repression, with the help of which human beings are able to turn away from unfavorable, undesirable mental development or behavior. This is sharply different from Freud, who uses a single term "repression" to indicate both the (more or less) normal and the (possibly) pathological modes of keeping something away from consciousness. For Freud, the two modes of repression are more similar than dissimilar; what is of radical importance is the existence or non-existence of the system of the repressed psychical representatives – that is, the system of the unconscious – and not whether something is repressed in a normal way or a pathological way. For Freud, neurotics, whose deployment of the repressed (that is, the structure of the system of the unconscious) is disturbed in

certain ways – and whose is not? – are basically put on the side of normality; only psychotics, in whose psyche the system of the unconscious Freud finds to be fatally damaged, are considered to be radically and irrevocably ill.

Freud's account of the development of the normal mode – that is, the neurotic mode – of repression is as follows. First, there is a phase of primal repression, "which consists in the psychical (ideational) representative of the instinct [*das Trieb*, the drive] being denied entrance into the consciousness." A "fixation" is established thereby. Then follows the second phase of repression, called "repression proper," which, aided by the repulsion from the direction of consciousness, functions to draw the derivatives of the repressed representative and the trains of thought associated with it away from consciousness. From then on, in the unconscious the repressed representative goes on "organizing itself further, putting out derivatives and establishing connections" (1915a, p. 148).

Thus, repression involves a detachment of psychical energy from the repressed representative; this is "the essential and regular mechanism of every repression." A normal person, although more or less upset or even traumatized by such a detachment, "will at once begin looking about for a substitute for the lost attachment; and until that substitute has been found the liberated libido will be kept in suspension within his mind, and will there give rise to tensions and color his mood" (1911, pp. 71-72). In the earlier "Project for a Scientific Psychology" (1895) a more mechanistic, neurological account was given to this same phenomenon: in the ψ system (the unconscious), psychical representatives of the experiences of satisfaction are repressed, in the sense that they are kept by bound cathexes, which form an organized system and in which the psychical energy is reduced to a greatly lowered level than it is in the other two systems, φ (perceptions) and ω (consciousness); as to the emotional aspect of a previous perception which is now repressed, it can only be dimly – almost imperceptibly – sensed as vague "qualities" of pleasure or unpleasure, which, like the signals of "1" or "o" in cybernetics, will serve to guide the movement of unconscious cognition and judgment toward the re-finding in reality of something matching the repressed representative.

That is, to be able to serve as reliable and useful biases guiding human decisions and behavior in effective ways, memory traces have to be repressed, to be divested of direct connections with the outside world, to be free from vexations of immediate emotional or intellectual reactions, to be structured according to the basically abstract relations between themselves, and to be put in some remote niche of the psyche which is called the unconscious. The conceptualization – the discovery – of this level of the human psyche is a tour de force of Freud, and the whole idea can be said to be paradox itself. To benefit from past experiences, including the related emotions and

thoughts, one has to first tone them down radically until they become imperceptible faint traces and are thus transformed into almost totally pure signifiers belonging to a signifying system, which is the Freudian unconscious. This much has been made clear through Jacques Lacan's "rediscovery" of the Freudian insight, especially in his seminar delivered in 1959-1960 (Lacan, 1992), which dealt with the technical as well as the moral aspects of the necessity for keeping the ψ system.

As a result of the normal course of the ever ongoing mental development, one is led, forced even, at the level of the core of one's being to give up one's attachment to what has been found to be dear and satisfying. But in unfortunate cases this activity of detachment may go wrong, and Freud tries to theorize on the factor that transforms it into being radically pathological. In neurosis, he points out, the liberated psychical energy is either displaced to other representatives or transformed into somatic innervations or into anxiety;

> but in paranoia the clinical evidence goes to show that the libido, after it has been withdrawn from the object, is put to a special use. It will be remembered that the majority of cases of paranoia exhibit traces of megalomania, and that *megalomania can by itself constitute a paranoia*. From this it may be concluded that *in paranoia the liberated libido becomes attached to the ego*, and is used for the aggrandizement of the ego. *A return is thus made to the stage of narcissism* (known to us from the development of the libido), in which a person's only sexual object is his own ego." (1911, p.72, emphasis added)

In their analysis of the case of Mrs. A and Mr. C, the Solmses have indeed arrived at the same conclusion, which is that such patients have regressed to the stage of narcissism. But the reality of this regression is interpreted by Freud and the Solmses in different ways, which is something of special interest to us. As was mentioned earlier, the Solmses, drawing support from Ramachandran's idea of "selective repression," interpreted Mrs. A's and Mr. C's usual neglect of their paralyzed left limbs as an effect of repression. "These patients are indeed continuously encoding information about their defective bodies, and at some deeper level they do indeed have knowledge about their handicaps and the emotional implications thereof " (Kaplan-Solms & Solms, 2002, p. 167). Apparently, the Solmses see the unconscious of these patients as intact and functioning well.

The story Freud tells is a completely different one. As was mentioned, repression consists of two phases, "primal repression" and "repression proper." After the system of unconscious is thus established, the normal path of development for a drive and/or

its representative is for it to proceed from the unconscious to consciousness via pre-consciousness "by this thing-presentation [i.e., the unconscious representative] being hypercathected through being linked with the word-presentations corresponding to it" (1915b, p. 202). (Incidentally, the dichotomy between the thing-presentation and the word-presentation seems to echo the widely acknowledged hypothesis of a division of labor between the right hemisphere and the left hemisphere of the brain, with the former preoccupied with emotions and concrete images and the latter oriented toward language and logic.)

In addition to the foregoing development and functioning of the basically normal mode of repression, Freud postulates a stage of further development, which is "the most important as regards pathological phenomena" and which he theorizes as "the third phase of repression." And according to his observation this is, paradoxically, "that of failure of repression, of *irruption*, of *return of the repressed*." And this irruption starts "from the point of fixation," i.e., from where the psychical representative got fixed in the unconscious. This abnormal path thus "implies a regression of the libidinal development to that point" (1911, p. 68).

Then we are led to see that the regression of psychical energy, which is more or less normal as long as it stops within the boundary of the system of the unconscious, may in some cases go out of bounds. This is something catastrophic. It may trigger the abolition of the system of the unconscious, and thereby nullify at one stroke the economic, topographical, and dynamic divisions that are essential for the effective operation of the psychical apparatus. The leveled chaos now becomes a raging cauldron of hallucinations and delusions. This fatal cataclysm Schreber poignantly sensed amid his mental confusion as "a profound internal change." And Freud gives the phenomenon a succinct description: "*what was abolished internally returns from without*" (Freud, 1911, p. 69, emphasis added). What was kept in the system of the unconscious, when it is set loose by the abolition of the system rather than pursue the normal path toward pre-consciousness and consciousness, emerges from somewhere outside the system in the forms of hallucination and delusion.

It has become clear in what cases regression is sure to reach out of bounds: it is when the fixation in question, from which a trend of regression or "return of the repressed" irrupts, is located in the developmental phases before the system of the unconscious, along with the mechanism of repression, was safely established. Those diseases with the related fixation, or the point of irruption, situated at the period of narcissism, e.g., paranoia, or at the period of auto-eroticism, e.g., schizophrenia, are characterized by this kind of abolition and the ensuing confusion. Freud has repeatedly made remarks to this effect.

This idea of Freud's is very important because it demarcates for us the realm of ψ,

or the unconscious. The ψ system is brought about by repression for the purpose of building up a computation center for the organism that is a human being. This organic computation center, just like artificial intelligence, executes its tasks by operating at a minimal level of energy because at this level whatever is stored there becomes a faint trace, a signifier. And this system propped up with the principle of minimalism, when suddenly flooded by the irruption of energy from a fixation before the Oedipal phase, the developmental phase marking the onset of repression, may experience a radical breakdown. This seems to be the common fate of the Solmses' ventromesial frontal patients and right perisylvian patients. Concerning the perisylvian patients, what is mistaken by Ramachandran and the Solmses for "selected repression" is actually what Freud identifies as failure of repression, or "return of the repressed from without" after repression, at least some essential part of it, has been abolished.

Some more words have to be said here about the Solmses' distinction between repression and inhibition. Let's compare their view with Freud's. For Freud, there is only one definition of repression: the phenomenon of repression happens whenever a psychical representative is "denied entrance into the conscious" (1915a, 145). For him, there is no clear-cut demarcation between what is normal or abnormal about repression; so long as the system of the repressed, i.e., the unconscious, manages to come into being and continue to exist somewhere, the psychical apparatus, as well as the whole human being, can fare fairly well. The reason why Freud fails to clearly distinguish between normal and pathological (or neurotic) forms of repression is, therefore, that repression means just one and no other mechanism, and that repression, even in neurotic cases, is fundamentally benevolent and indispensable.

For Freud, indeed, what is pathogenic is belated repression. He conjectures, "If ψ is able to put this inhibition into operation soon enough, the release of unpleasure, and at the same time the defence, will be slight; otherwise there will be immense unpleasure and excessive primary defence" (1895, p. 325). The latter case is possibly pathological; it can trigger failure of repression, or "return of the repressed."

Obviously, the Solmses' distinction is the result of a misunderstanding of the Freudian conception of repression. They reserve the Freudian term "repression" for the neurotic modes of keeping something away from consciousness, "inhibition" being what they call the allegedly normal mode. As for the extreme cases of regression one sees in right perisylvian patients, in which the mental state regresses to a phase before the emergence of repression and thus causes its ψ system to break down because of the inundation of undiminished quantities of psychical energy, the Solmses mistakenly equate them with the neurotic condition; such patients, they say, reveal "selective repression" because they retain unconscious knowledge about their plight. The ψ system of these patients, whose conditions the Solmses diagnose as

paranoia, melancholy, and narcissism, has broken down in an essential way. In a word, these patients should be given the same diagnosis as the one Freud gives to Schreber, that is, the abolition of the unconscious. The complex nature of this syndrome will be further looked into in the next section.

3. Ψ and the Signifying System

Damage to the right cerebral hemisphere results in what is known as "right-hemisphere syndrome," which have been generally supposed to include symptoms of three categories: first, unawareness of deficit, even a near-delusional disavowal of illness, and sometimes an emotional indifference toward their disabilities; secondly, neglect of the left-side of space, including their paralyzed limbs; and thirdly, disorders of spatial perception and cognition (Kaplan-Solms & Solms, 2002, pp. 150-153).

To the categories of symptoms cited above, the Solmses add a sub-category to "neglect" and it is misoplegia, an obsession with the left-hand side of the body in the form of a negative attitude (e.g., disgust or repulsion) that is sometimes even "organized into a near-psychotic hatred of the left arm or leg" (Ibid. p. 152). The Solmses regards this sub-category as not having been "adequately integrated into contemporary neuropsychological models of the mechanisms underlying the syndrome, or into models of the normal psychological functions of the right cerebral hemisphere" (Ibid. p. 152), and they will subsequently cite this phenomenon as a support of their conclusion of "selective repression"; the negative emotions of the patients, they suggest, prove the existence of "their unconscious knowledge of the paralyzed state of their bodies," which is repressed "because this knowledge is a source of intolerable distress to them" (Ibid, p. 160).

I agree with the Solmses that misoplegia has not received the attention it deserves, but I find their account of the symptom to be somewhat amiss. In order to clarify, let us first take a closer look at the cases of Mrs. A and Mr. C. These patients' lucid *awareness* of their paralysis is achieved and retained only as long as the momentary *perception* of their paralysis lasts; and this perception of theirs lasts only as long as they are aided by the *external* caloric or therapeutic stimulation. To fully analyze this paradoxical phenomenon, we have to resort to the Freudian conception of the human psyche as a composite structure, especially the earliest version.

In "Project for a Scientific Psychology" (1895) Freud postulates a psychical apparatus composed of three systems: φ (perceptions), ψ (the unconscious), and ω (consciousness). In the φ system there are perceptions of the external world, which do not leave memory traces or mnimic images behind them. This system does not have the function of learning; it serves merely to offer indications of the outside world.

These indications are turned into memory only after they are registered in the ψ system. The registration procedure is meticulously conceptualized by Freud. A quantity of energy coming from φ (called Q to indicate that it is of the energy level of φ) is upon entering ψ greatly diminished by being ramified and led along various neuronal pathways. It is here in ψ, at a radically toned-down energy level, called Qη, that the human psyche is put on its journey of "reality testing" (that is, the effort to seek identity between the memory trace of satisfaction with the external perception) quite freely along the various paths or chains of memory traces linked by facilitations (*Bahnungen*), which are the permanently altered states of the contact-barriers of the ψ neurons brought about by previous experiences, or, to use today's neurological terminology, the connections between pre-synaptic activation and post-synaptic potentiation. Today we know that such connections, called conditioning, is brought about by activating the inhibiting circuit involving essentially the prefrontal cortex, with the ventromesial part as its core. We also know that the operation of this circuit relies basically on inhibiting neurotransmitters, such as GABA and serotonin. In contrast, the brain circuits involved in perceptions, emotions, and the process of learning (that is, the thalamus-amygdala-hippocampus circuit and the pathways in the primary and secondary sensory cortices) rely essentially on excitatory neuronal agents, such as dopamine and acetylcholine. These two circuits correspond respectively with Antonio Damasio's "as-if body loop" and "body loop" of the mental activities (1994). We can now, by comparing findings of neurological studies and psychoanalytical theory, infer that the detachment of psychical energy from the repressed representative, which is "the essential and regular mechanism of every repression" and which we have discussed in the context of the Freudian theory, is achieved by substituting for, or at least supplementing, the "body loop" or the direct pathways in and between φ and ω with the "as-if body loop" or the roundabout activity of reality-testing in ψ. Since it is now known, though preliminarily, that the retrieval of long-term episodic or contextual memory involves the increase of dopamine in the more posterior parts of the hippocampus (in contrast to the anterior parts, which is activated by novel experiences) (Strange & Dolen, 1999), we can speculate that the principle of minimalism of ψ – i.e., that there is energy of a minimal level of quantity flowing along pre-cathected and pre-organized pathways in ψ – means neurologically the joining of the excitatory factor and the inhibitory factor, with the latter being the dominant actor.

In the next step, the flow of minimal level of quantities proceed toward the direction of ω or consciousness. (A regression is prevented by the mechanism of inhibition or defense, especially a regression going beyond the boundary of ψ and directly back into φ instead of taking a normal detour through ω. The latter type of

regression will cause psychosis.) The faint memory traces, something like Damasio's "dispositional representatives," stored in ψ will in the process of the mental activity of reality-testing be "hypercathected through being linked with the word-presentations corresponding to [them]" (1915b, p. 202) and thus enter the system of pre-consciousness and consciousness. This is said to be yet another registration of mental inscription. Thus we see that the Freudian psyche has a stratified structure, in which a mental trace has to be inscribed several times in different layers. And it is only by passing from one system to another in the right order, and most fundamentally, by taking the detour through unconsciousness, that one can steer safely from perception to consciousness to find ways leading to satisfaction of one's desires as well as to one's survival.

The tripartite structure of the human psyche, it is clear, base all its meaningful activities on the soundness of the ψ system, the meeting place of one's past, present, and future. It is this part of the self that Freud calls the "ego," which he defines as "the totality of the ψ cathexes," or "a network of cathected neurons well facilitated in relation to one another" (1895, p. 323). It is within the boundary of this network that the secondary process of thought will proceed from one faint memory trace to another along the pre-organized paths; and this is the way a human being will manage to handle all her needs, desires, judgments, decisions more or less successfully. Thus the ψ store of constantly cathected representatives (*Vorstellungen*, as Freud calls them) or memory traces will be, as Jacques Lacan emphasizes, "the core of the psychic apparatus" (1992, 51) as well as the core "around which the human world is organized" (1992, p.49).

We are now prepared to recast the structure of ψ in the light of recent findings from neuropsychology. Freud conjectures that "the ψ neurons should be divided into two groups: the neurons of the pallium which are cathected from φ and the nuclear neurons which are chathected from the endogenous paths of conduction" (1895, p. 315). As has already been pointed out by the Solmses (2002), Damasio (1994) and others (e.g., Bechara, 2000), the ventromesial frontal cortex is the neuronal equivalent of nucleus of the ψ system. This brain region, which is the site of Damasio's "as-if body loop," is the hub of the psyche that takes charge of the monitoring and maneuvering guided by what he calls "somatic markers," which are both the psychical representatives and the facilitated pathways (drives) in the Freudian scheme. The stimulations this part of ψ receives "from the endogenous paths of conduction," we can identify, are the action-potential concerning emotions and episodic memories coming from the thalamus-amygdala-hippocampus circuit.

And the stimuli from φ that Freud says cathect the neurons of the pallium, we can surmise, may be mainly from what one finds extremely perplexing in the

Solmses' studies, namely, the right cerebral hemisphere, which is in charge of spatial perception and cognition. This brain region "is usually conceptualized as a literal localization within the tissues of the right hemisphere of the engrams for allocentric topographical relationships, and for the orientation of one's own body in extrapersonal space" (Kaplan-Solms & Solms, 2002, p. 153).

We can then, following Damasio's hypothesis of ongoing monitoring with the help of what he calls the "somatic marker," venture the conjecture that the flows of information carried by stimulation from both directions, i.e., that from φ to the pallium of ψ and that from the limbic circuit to the nucleus of ψ, are constantly put in juxtaposition with one another, and also with the related memory traces already stored in the nucleus of ψ (i.e., the ventromesial frontal cortex), and in the process the three versions of information exert influence on one another. This influence is a kind of orthopedics concerning the organization of ψ, which is a holistic picture of one's world. It is orthopedic because the juxtaposition means putting together the new sets of spatial relations and of episodic context, and the old version of the self-world relations. We can even speculate that this is a secondary orthopedics in the psyche, the primary treatment of this kind being the adjustment made when the two sets of structure – the spatial and episodic structures – are rendered in their respective brain circuits. And now, when these two sets of structures and the existent version of self-world relations are put together, a radical transformation is achieved: the merging process involves a kind of chemical cgange and the resultant radical decrease in energy level (which we know is attained mainly by the shifting to the dominance of inhibitory neurotransmitters).

The radical transformation of the chemical and quantitative aspects functions to usher in something radically new: the signifying system. This is just what the re-inscription of the memory traces in (the nucleus of) ψ means actually; here, as Lacan (1992) points out, they become faint, monotonous traces and are thus transformed into signifiers.

And again as Lacan (1992) points out, Freud postulates a thought-provoking theory of how the psychical apparatus executes cognition and judgment. According to Freud, cognition involves dissection of a perceptual complex into two parts, of which one is "non-comparable" and "stays together as a *thing*," and the other, the attributes of the "thing," "can be *understood* by the activity of memory." Freud surmises that, because the "thing" has no practical purpose, during the process of judging its cathexis is discharged; this explains why the attributes or predicates "are separated from the subject-complex by a comparatively loose pathway" (1895, pp. 331-332). From this we can deduce that the giving up of the cathexis of the "thing" *is* the instance of primary repression, or the successful resolution of every traumatic

experience. The “thing” is non-comparable and defies all attempt of understanding; therefore, if its cathexis were maintained, hallucinatory thought and unpleasure might ensue. It is the radical repression of this “thing” that establishes ψ as a signifying system.

References

Damasio, Antonio. (1994) *Descartes' Error: Emotion, Reason, and the Human Brain*. New York: Harper Collins.

Freud, Sigmund. (1915a) Repression. In *The Standard Edition of the Complete Psychological Works of Sigmund Freud* (*SE*), vol. 14. 141-58.

_____. (1915b) The Unconscious. *SE* vol.14. 159-204.

_____. (1950 [1895]) A Project for a Scientific Psychology. *SE* vol. 1. 281-387.

_____. (1985 [1887-1904]) *The Complete Letters of Sigmund Freud to Wilhelm Fliess: 1887-1904*. Ed. Jeffrey Moussaieff Masson. Cambridge, Ma.:The Belknap Press of Harvard University Press.

Kaplan-Solms, Karen, and Solms, Mark. (2002) Clinical Studies in Neuro-Psychoanalysis: Introduction to a Depth Neuropsychology. London: Karnac.

Lacan, J. 1992. *The Seminar of Jacques Lacan, Book VII: The Ethics of Psychoanalysis, 1959-1960*. New York: Norton.

Strange, B.A., and Dolan, R.J. (1999) Functional segregation within the human hippocampus. Molecular Psychiatry, 4: 508-511.