

**DISCONNECTION OF EXTERNAL AND INTERNAL IN THE  
CONSCIOUS EXPERIENCE OF SCHIZOPHRENIA:  
PHENOMENOLOGICAL, LITERARY AND  
NEUROANATOMICAL ARCHAEOLOGIES OF SELF**

*Aaron L. Mishara*

ABSTRACT

Patients with schizophrenia demonstrate an inability to distinguish internal from external sources of some experiences. Although there are numerous models, the causes and neural substrates are largely unknown. In schizophrenia, the commonsensical overlapping oppositions of internal/external, self/other, active/passive, mind/body, voluntary/involuntary become disentangled. Due to the loss of common sense, the imprecise coincidence of these oppositions inner and self, outer and other, mind and body lose their obviousness to the patient. Once the nexus of oppositions is unraveled, the patient tries to recover order by keeping the oppositions clear and separate in delusional interpretations of reality. The patient counters with delusional schemes that artificially keep these oppositions from merging. However, this web of proximate and overlapping oppositions lost to the patient not only inform the way we describe our everyday experience but also implicitly guide our conceptual models in psychology and neuroscience. Their source is a resilient but also protective common sense.

Phenomenological method brackets the oppositions of common sense to study the otherwise concealed structures of consciousness. However, when applied to schizophrenia as a disorder of consciousness, phenomenology is burdened by controversy between two approaches: the Apollonian and Dionysian. Both traditions propose that the loss of common sense (in which the paradoxes and contradictions implicit to everyday experience are "overlooked" (von Weizsaecker)) is core to schizophrenia. Experience no longer rests on what is assumed to be probable (Blankenburg), but only proceeds in staccato, what must be, or delusional certainty. The Apollonian approach (Minkowski, Sass, Cutting) claims that the destruction of common sense in schizophrenia comes from above, melting under the scrutiny of an intact but too intense "hyperreflection." The Dionysian approach (Binswanger, Blankenburg, von Weizsaecker) attributes the erosion of common sense, coming from below, to a disruption of pre-attentive, automatic processing. The patient attempts to piece together experience by means of delusions in terms of the remaining fragments. However, both traditions have not been directly studied experimentally. The Apollonian model is hard

to operationalize and remains untestable. Moreover, most experimental evidence indicates that attentional processing is not intact in schizophrenia, with pronounced deficits in sustained and selective attention and the recruitment of brain areas guided by top down processing. This suggests that many of the effects would not be due to too much concentration but its absence. Supporting the Dionysian view, the distractibility and attentional capture in patients with regard to fragments of experience not relevant to current goals may be secondary to abnormal salience and disrupted mesolimbic dopamine function (Kapur, Grace), i.e. pre-attentional factors.

The metaphorical association of above and below with external and internal – in terms of the inner depths of the self - is modern, and is found in German Romantic and later existentialist authors, such as Kafka. The journey into the self is associated with depth, a descent into the underworld.

The metaphorical relation between depth and inner may also be found in the neuroanatomical mapping of cognitive function onto the cytoarchitectonic structure of the brain. Several contemporary prominent neuroscientists and neuropsychiatrists (Cummings and Mega, Mesulam, Pandya and Yeterian) subscribe to a not-well known evolutionary theory of the dual origin of cortical development (Sanides) in terms of more inner, deeper core structures. An amygdala-orbitofrontal division, which is more concerned with conveying information about the organism's internal milieu is distinguished from a hippocampal-cingulate division, which is more concerned with the registering of external information. Using this division, I propose links between philosophical, literary and neuroanatomical approaches to examine the loss of the common sense relation of internal and external experience in schizophrenia. In doing so, I suggest some neural pathways that could be linked with phenomenological and neuropsychological evidence of brain dysfunction in schizophrenia.

"It is impossible to say everything and it is impossible not to say everything." (Kafka, 1967, p. 464).

## 1. Schizophrenia: Loss of Commonsensical Relation Between Inside and Outside

Patients with schizophrenia appear to be preoccupied with, or overvalue their own inner experiences. This is why the phenomenological psychiatrist, Binswanger (1957), described the individual patient's world as an *idios kosmos*. He believed that the privacy (*idios*) of the psychotic world resembled the self-enclosed universe of dreaming.<sup>1</sup> To the extent

---

<sup>1</sup> For the philosopher, Merleau-Ponty (1978), the experience of body forms an enclosure which enables the experience of dreaming: "... the dream is inside in the sense that the internal double of the external sensible is *inside*, it is on the side of the sensible wherever the world is not." (p. 262). Dreaming is able to produce an illusion of externality that

that schizophrenia patients are preoccupied with an internal universe, they seem unable to discern a world separate from, or external to it. Thus, despite an apparent confinement to an internal world, their ability to separate internal from external experience, paradoxically, seems to be incomplete or disrupted. This is reflected in what Frith calls the passivity experiences in schizophrenia. 1. In delusions of control, the patient “experiences” “alien forces” to be controlling the patient’s most trivial actions. 2. The patient may experience thoughts being inserted into her mind, or experience these thoughts as if they were spoken aloud (*Gedankenlautwerden*) or 3. Voices (auditory hallucinations) comment about the patient in the third person. It is as if the surface of the body were completely porous and offered no protection from intrusions from other minds, minds that are often not seen but only imagined. Thus, it appears that patients with schizophrenia are deprived of a “normal” separation between internal and external experience as well as relatively accurate judgment about the internal or external sources of this experience. This is also reflected in other symptoms of schizophrenia and may possibly be at the root of some of the well-documented neurocognitive deficits in schizophrenia.

The neuropsychologist, Keefe (1998), writes that

... schizophrenic patients may lack not only insight about the severity of their symptoms but also the general ability to take an observer’s perspective about themselves. ....[they] may not be able to move flexibly between internal and external perspectives owing to an inability to maintain the distinction between externally generated events and internally generated events. (p. 144).

Why is the distinction between inner and outer so natural or obvious for the rest of us but so problematic for patients with schizophrenia?

Blankenburg (1969, 1971, 2003; Mishara, 2001) observes that a core symptom of schizophrenia is the loss of common sense. “Normally,”

---

resembles the intractable, bizarre beliefs of psychosis, e.g., the forces that control the subject’s actions or voices that address or comment about the subject really are there. Moreover, this illusion of externality is made possible by the human experience of body (See Mishara, 2005, for how human experience of body is mediated by shifting internal and external frames of reference).

common sense has a protective function in maintaining an unquestioned, "natural" relationship between internal experience and external "reality." Our mental health is preserved by a certain "resistance" to losing common sense. This resistance functions precisely by our feeling compelled to overlook common sense because it is so obvious. The inner structure of common sense withdraws behind its surface obviousness which resists further inquiry or reflection. This structure is composed of largely implicit processes which form the background of experience: rule following in social situations, probabilistic reasoning (mediated by subcortical structures such as the basal ganglia), and the holding in compact, or tightly knit unity, verbal or conceptual oppositions (e.g. inner/outer) which would otherwise lose their experiential relationship. But once the obviousness of common sense is lost, its absence is painfully salient. As a patient with the relatively rare form, "simple schizophrenia," reported by Blankenburg (1969) painfully but eloquently states:

What is it that I am missing? It is something so small, but strange, it is something so important. It is impossible to live without it. I find that I no longer have footing in the world. I have lost a hold in regard to the simplest, everyday things. It seems that I lack an understanding for what is matter of course and obvious to others. ... I am missing the basics... Each thing builds on the next... I do not know what to call this... it is not knowledge... Every child knows these things! It is the kind of thing you just get naturally. ... It is such a strange feeling, when one does not know even the simplest of things. (Translation, Blankenburg, 2001, pp. 307-9).

Blankenburg comments:

Not only is the patient pained to have lost something which seems to be very small but she must also suffer that the rest of us barely appreciate this essential component of our experience and have the greatest difficulty to empathize with what it would be like not to have it. (p. 308)

It is the loss of something so "small," so deceptively obvious, that we otherwise overlook its fundamental importance to the extent that it functions properly.

## 2. The Inside and Outside of Auditory Hallucinations

In an interview with the author, a male patient with schizophrenia, with the pseudonym D.L., (to maintain confidentiality) in his mid-twenties, reports particularly severe and frequent auditory hallucinations. He is currently in the non-medicated (placebo) phase (as revealed to the author later) of a double-blind, cross over study of the effects of antipsychotic medication on cognition and symptoms at NIMH. The patient speaks with long delays between sentences and smiles intermittently (presumably in response to his hallucinations). D.L. reports that his voices are broken up into two kinds: those that occur “outside” his body and “internal voices” or the “voices inside my head.”

1. The “outside” voices: “They sound like they are coming from just about everywhere ... outside the building. This occurs usually when I am in my room. They are kind of distant from me ... The voices could be anybody or everybody, for example, people I come in contact with, read about in the magazines or who are on the TV ...”
2. Then there are the “internal voices”: “They are sort of adapted to my own voice and talk bad about the voices outside my head... It sounds exactly like I am saying them or thinking them ... So they [the outside voices, AM] think its me talking about them like gossiping and calling people names ...”

I try to paraphrase the patient’s thoughts: “So the internal voices sound like your voice in such a way that the outside voices hear these voices and think you are talking or thinking badly about them?” “Yes,” he answers. “The (internal) voices will say something real bad about a person I was not even thinking about at that moment ... and then, all of a sudden, the person shows up [i.e., the outside voice, AM] and says: ‘you are thinking that about me’. The internal voices start talking about somebody in my head and it is almost as if the person appears outside the window, one of the distant voices [or outside voices, AM] that hears what they are talking about. The inner voices sound like your voice [the patient uses the expression “your“ in a colloquial manner referring to his own internal experience, AM]. So the outside voices hear these voices and think you are talking or thinking about them. I try to summarize: “They

mistakenly think the inside voices are *your* thoughts.” “Yes,” he answers.

After two weeks transition into the medication arm of the study, the patient reports that the voices do not decrease in frequency. However, they have changed their content to more pleasant statements.<sup>2</sup> The patient is relieved and is often observed to be smiling or laughing in response to the voices. After three weeks, the external voices are diminished, nearly disappearing. As in previous investigations which suggest that inner speech may be involved in the generation of hallucinations, I ask the patient to hum. The patient observes that, during the humming, the voices go away. Although complaining about the persistence of the voices, he did not infer a connection between his own action, the humming and the voices stopping.<sup>3</sup> Apparently, indifferent to this observation, he has no

---

<sup>2</sup> This observation suggests that antipsychotic medication may impact the emotional experience of the auditory hallucinations (positively) in a brief period prior to reducing their frequency in some responsive patients. If true, these findings could have implications for understanding the networks and neurobiological mechanisms underlying hallucinations, including their emotional content, frequency and pleasantness/ unpleasantness for the subject. The clinical efficacy of both typical antipsychotic agents and the newer generation atypical medications are thought to depend primarily on the antagonism of the dopamine (DA)-D<sub>2</sub> receptors (Kapur et al., 2000). The “therapeutic widow” for both typical and atypical antipsychotics is approximately 60-65% blockade of the dopamine (DA)-D<sub>2</sub> receptors. Thus the currently documented sequence of effects of antipsychotic medication on first the pleasantness of the content, and then, frequency, suggests that the dopaminergic blockade may first affect the pathways or networks concerned with the emotional evaluation or experience of the semantic verbal content before nullifying the actual production of the hallucinations themselves. (In section 5, there is a discussion of pathways that may be involved in generating and discriminating emotional experiences (e.g., the neuroanatomical model proposed by Pandya and Yeterian, 2003) and their relationship to our common sense experience of inner and outer).

<sup>3</sup> Patients with schizophrenia have resulting difficulty in perceiving or inferring causal links between their own actions and effects in their environment. They may also have difficulty in making causal links between others person’s intentions and their behavior. Some researchers have concluded that these abnormalities involve a dysfunctional modular cognitive mechanism which is dedicated and domain-specific. For example, Gallagher and Frith (2003) review neuroimaging studies which putatively localize a “theory of mind” module in the brain. This module enables us to represent a person’s beliefs, desires, goals, emotions and intentions as causing his or her behavior but which may not correspond to reality. That is, we are able to represent imaginary circumstances about another person’s interior mental state “decoupled” from ‘external’ reality. As is presented in this article, phenomenological approaches attribute the disruption of the

desire to try the “experiment” again. After approximately four weeks of psychopharmacological treatment, the patient is able to identify the voices as sounding very much like his voice but he still denies that he has any role in producing these thoughts or voices.

In the above example, the patient steadfastly adheres to a distinction between inner and outer that most of us, - I can safely assume - would not subscribe. Although we might be tempted to think that the inner voices are only available to the inner experience of the patient, the mysteriously appearing “outer” voices are able to “hear” the “inner” voices. The patient is not at all bothered by the fact that I or other people he may encounter are unable to hear his voices. Rather it is only the other, outer “voices” who are able to overhear his inner voice(s). Although interior and exterior roughly corresponds to where his body ends and the outside world begins, the body does not form the boundary between self and others. The patient’s internal experience of self is not housed by the body. Interior experiences (voices, thoughts) are somehow accessible to external others, the outside voices.

Admittedly, most of us would agree that our common sense view of the distinction between internal and external is only a very rough approximation: where does the air that I breath, the odors that I smell, the food that I chew, the light that strikes the surface of my retina stop being outside, and belong to the inner province of my body, i.e. become mine? Touch or tactile pain, for example, is both experienced on the surface of my skin and yet as inaccessibly mine somewhere beneath the skin. Others may sense what I am feeling but are unable to read my thoughts. *Because my inner experience is also experienced as relatively private or inaccessible to others, I associate this with the province of my inner self.*<sup>4</sup> Despite innumerable cultural variants in what is called

---

relationship of inner to outer experience in schizophrenia to the loss of common sense and not an impaired theory of mind module or ability to represent mental states. However, there are two fundamentally diverging views in what causes the disruption.

<sup>4</sup> Merleau-Ponty (1978) writes of the paradoxical interweaving (Verflechtung) that makes up the structure of self and other as it is ‘interior’ (i.e., within the subject): “it is indeed impossible to grant access to my world to the others’ perception; and, by a sort of backlash, they also refuse me this access which I deny them.” (p. 9). Self and other (as so many of the other oppositions of common sense underlying both our folk and conceptual psychologies, e.g., inner/outer, self/other, body/mind, active/passive,

“inner” or “mine,” this is not merely a way of talking about my experience which, in turn, constructs or shapes by means of categories which anticipate and bias my experience. The very fact that neurologic and psychiatric disorders may disrupt such common sense experience suggests that brain systems and processes support such experiences and are vulnerable to disruption. How tenacious and adaptive are these processes, on the one hand, and how fragile and easily disrupted on the other (like some optical illusion which, once discovered, temporarily disappears). Thus the common sense oppositions related to internal/external of self/other, voluntary and involuntary, etc., are disrupted in their relationship to one another as well. As soon as one of the “obvious” oppositions becomes disrupted the other overlapping but non-coincident ones follow suit. The patient’s distinction between inner and outer voices offends our common sense view of things. The latter assumes a rough overlapping between inner vs. outer, self vs. other etc. However, equally puzzling are our complementary common sense views. Why in fact do we not require much precision in how we categorize our experience and the world in terms of inner and outer? Why are the rough approximations sufficient and unperturbed in our common sense experiences so long as we do not examine or scrutinize them too closely?

The neuroscientist, Llinas (2001) optimistically writes that the work of the philosophers are done, the rest belongs to cognitive neuroscience. But is it not rather the other way around? The counter-intuitive results of neuroscience lead us to a labyrinth of contradictions that had been anticipated by philosophy:

Whence the age-old ill-humor against philosophy is reanimated, the grievance brought against it that it reverses the roles of the clear and obscure.” (Merleau-Ponty 1978, pp. 3-4).

As in schizophrenia, philosophy is deprived of the consolations of

---

voluntary/involuntary, conscious/unconscious presuppose but mutually exclude one another. “None of the oppositions can be given without the presence of its counterpart in what Viktor von Weizsaecker called a relationship of *mutual concealment*. Each term presupposes the other and yet excludes it, depending on the momentary perspective of the subject. He called this revolving-door principle of the Gestalt-circle.” (*Gestaltkreis*) (Mishara, 1994, p. 138).

common sense. It renounces the effortless obviousness of common sense to explore its hidden structure, a network of tightly interconnected oppositions seeming to be inextricably linked. That is, once it is acknowledged that these oppositions become unraveled in neuropsychiatric disorders such as schizophrenia, we discover that the common sense oppositions we use to describe mental experience in folk psychology are often applied in an unquestioned manner to our understanding of how brain must work. Paraphrasing Molière, the phenomenological psychiatrist, Straus (1958) writes: "We are all metaphysicians in spite of ourselves" (p. 140).

The brain processes that support consciousness are not transparent to consciousness because it was advantageous (in an evolutionary sense) to develop illusions that attributed selective aspects of these brain processes to a represented unity of the organism, not just an organism in movement but an organism which can represent itself in episodic memory and thus shift frames of reference between those centered on the body and those centered on the world (see Mishara, 2005). However, it is not a given that the body must be consciously experienced as a unity. Some philologists have suggested that the ancient Greeks did not see the body as a unity at all but rather as a kind of composite of links, i.e., what was necessary to throw a spear effectively. Nietzsche had proposed that human consciousness emerged by means of carefully constructed perceptual and cognitive illusions (perspectivism) in which a false or imaginary unity of self is retrospectively imposed on a multiplicity of representations (wills-to-power). This is not unlike Lacan's thesis that a mirror image of a unified body (the "me") is imposed on the prior multiplicity of a "fragmented body" (also imaginary).

More recently some of the most compelling evidence for a "user's illusion" of the self and its brain comes from the experimental work of Libet and colleagues (1983). He demonstrated that the attribution of a movement as one's own in the conscious awareness of the intention to move actually follows in time the first impetus to move as indicated by its *Bereitschaftspotential*. Self-consciousness appears to have evolved by attributing agency and self ownership of body retrospectively to the central nervous system representation of the movement. Consciousness evolved in the brain to the extent that it was adaptive to be under the illusion that the unity of the organism could be identified with this consciousness, thereby allowing processing required for computations of

bodily orientation, voluntary and involuntary movement etc., to proceed as if consciousness (which was actually processing these computations at a much slower rate) were performing these operations.

To put the matter concisely: Patients with schizophrenia do not benefit from the illusions of common sense that enable smooth transitions between frames of reference in the everyday experience of a shared social reality (*koinos kosmos*, Binswanger) (Mishara, 2005). They find themselves reduced to a universe of subjectively meaningful expressions which cannot be shared with others (*idios kosmos*) in which attempts to communication remain painfully incomplete, or incomplete in a way that never reaches another's shared experience.

Common sense requires the collusion of top down processing to fill the gaps or scotoma in our experiencing that would otherwise be distracting if not unsettling. Patients with schizophrenia appear to be deficient in these helpful illusory processes which allow for this retrospective patching up and restoring the sense of continuity of experience as if the self were in control or had ownership of the experience. This is the attribution of self via the "completed" or unitary body image, i.e., to have a body, to have a self (Mishara, 2005).

There have been numerous attempts to explain this confusion or inability to separate experiences which have an internal source from an outer or external one in schizophrenia. There are too many to summarize here (e.g., Johnson, Keefe, Brebion: impaired source monitoring; a defective filter and/or abnormal gating (Braf, Chapman and Chapman); the inability to benefit from experiential redundancies to form a background context in which controlled processing becomes automatic; Blakemore, Frith: disrupted efference copy or internal forward model of intended movement, etc.). In most of these models, we view the inability to differentiate internal from external sources in schizophrenia as resulting from a deficit, from an impaired cognitive mechanism or brain system. In what follows, I will describe two phenomenological approaches to the loss of common sense in schizophrenia: the Apollonian and Dionysian approaches. I will describe the problem not so much as a loss of the distinction between inner and outer but rather from a too great emphasis on their separation as compensation for their lost common sense unity.

### 3. Phenomenological Models of Schizophrenia: The Apollonian and Dionysian Traditions

There are two fundamentally divergent views in the phenomenology of schizophrenia. For the purposes of exposition, I will playfully describe them in terms of a Greek myth, the fateful journey of Icarus. In preparation for their flight from Crete, Daedalus admonishes his son, Icarus, not to fly too close to the sun. The heat will melt his wings crafted from feathers and wax. However, he also warns that Icarus should not fly too close to the sea for fear that the high waves may reach up and pull him down to its depths. Icarus does indeed fly too high and eventually plunges into the sea that will bear his name, the Icarian Sea. One phenomenological tradition proposes that the danger of falling ill to schizophrenia comes from above, from excessive rationality, reflection or hyper-reflexivity. The alternative tradition proposes that the danger first comes from below. The latter view maintains that, in early schizophrenia, the experience of the patient's world seems to fall apart as if the very foundation has been removed.<sup>5</sup> There follows a striving "upwards" in which delusional ideas are employed to escape the dangers of being consumed by the turbulent surf of the Dionysian depths. Binswanger calls this upward striving in schizophrenic psychosis,

---

<sup>5</sup> Blankenburg (1969; 1971) describes the loss of "common sense" as the disruption of the natural, taken for granted obviousness (*Selbstverstaendlichkeit*) of ordinary consciousness in both the florid, actively psychotic and "simple" forms of schizophrenia. As one of his patients observes, this is something which is so obvious and so "basic" to the rest of us that we "overlook" its importance for everyday life. Blankenburg (1971) explains: "it is basic because, on the one hand, it does not differentiate itself from the ground or background of familiar, everyday consciousness and is therefore usually overlooked, and, on the other hand, because it – being identical with this ground – serves as the very basis of the everydayness of human existing in a world." (p. 62, my translation). Other German phenomenologists (e.g., Pauleikopf) describe a loss of stance (*Standverlust*) in beginning psychosis as a loss of foundation or support from below. Although the vocabulary of cognitive science was not yet available, the disruption is at first "bottom up" engaging whatever compensatory "top down" processes are available to the patient to maintain some continuity of experience. Although these metaphors are primarily spatial, they also govern our scientific and conceptual approaches to the problem. Binswanger proposes that such metaphors are actually "lived" in how we organize experience as embodied agents: "not only in the construction of a 'lived space' but in the possibilities of existence as such" (Mishara, 1997, p. 63).

*Verstiegenheit*, sometimes translated into English as “extravagance.” As the mountain climber in vertigo, the patient finds herself unable to climb further upwards or descend to a safer plateau. It is this compensatory “*Verstiegenheit*” which the first approach confuses with hyperreflexivity, there is a “striving upwards” in the face of “bottomless anxiety” (Binswanger, 1957). Due to the resultant disproportional emphasis on the verticality rather than horizontality of human relations, there is a loss of the ability to transcend one’s current perspective, i.e., *trans-cendere* or *ueber-steigen*, step beyond or over where one was just a moment before (see Mishara, 1997).

Still borrowing from Greek mythology, I will refer to these two rival phenomenological traditions (following Nietzsche’s oft-cited opposition) in terms of the Greek gods Apollo and Dionysus:

(1) In the Apollonian tradition<sup>6</sup>, a vigilant but intact reason objectifies and alienates the subject from instinct, emotion, and vitality. It is what the phenomenological psychiatrist, Minkowski (1953, 1970), calls the “loss of vital contact with reality.” The latest proponent of this view is John Cutting (1997; 1998) who aligns himself with Minkowski’s concept of morbid objectification (or, morbid rationality) and Louis Sass’ concept of hyperreflexivity. The patient with schizophrenia does not suffer from irrationality or a regression (in the psychoanalytic sense) to a more primitive state, but from a morbid and excessive rationality: it is “... a disease of the intellect born at the highest pitches of self-consciousness and alienation” (Sass 1994, p. 12). The effects of an all too vigilant self-reflection, or hyperreflexivity, are self-objectification, alienation, devitalization, and fragmentation. Morbid rationalization involves a “hypertrophy of intellect and atrophy of instinct” far from the excesses of Dionysian primitivism. One might say that there is hyper-mind and hypo-body or that the patient lives the mind-body problem which, for the philosopher, remains only a dilemma for thought or metaphysics. It involves a “detachment from rather than a being overwhelmed by

---

<sup>6</sup> Sass (1994) characterizes Dr. Schreiber’s psychosis as an Apollonian illness, which is often present in schizophrenia: “... many schizophrenic patients describe the world of psychosis as a place not of darkness but of relentless light – light being the natural metaphor for conscious awareness... (citing Sechehaye, *Autobiography of a Schizophrenic Girl*) ‘where reign(s) an implacable light, blinding, leaving no place for shadow.’”

emotion and desire” (1994, p. 12).<sup>7</sup> Similarly, Cutting (1997) calls schizophrenia “an emotionless disorder.” (p. 503). In schizophrenia, experience becomes “subjectivized” (i.e., it becoming confined to the immanence of mind. Sass (1994) compares “philosophy and madness,” especially the philosophy of the phenomenologist who re-duces the world to self – re-duction in the sense of the Latin, re-ducere, a leading or stepping back from world to subjective consciousness).

The more one stares at things, the more they seem to have a coefficient of subjectivity; the more they may come to seem ‘things seen’.... In this situation, any object of awareness tends to feel as if it depends on me in some special way, belonging to my consciousness as a private and somehow inner possession. (Sass, 199, p. 36).

This observation resonates with most of us who have had experiences of staring at our own faces too long in the mirror or repeating a word over and over again until it loses its meaning. The effects of “perceptual and cognitive satiation” are well known to cognitive psychologists (Esposito, 1987). Although Cutting (1997) acknowledges that there are anomalous perceptual experiences in schizophrenia, he nevertheless reports that the objects of experience remain intact, if “often nonvivid and out of context” (Cutting, 1997, p. 502). That is, the danger in schizophrenic psychosis and other symptoms comes from above, not below.<sup>8</sup>

(2) The second approach, the Dionysian, proposes that the danger comes from below – not in terms of exaggeration of experience by means of hyperconcentration – but in terms of the object’s loss as if an engulfing sea eventually swallows the perspective of the schizophrenic subject

---

<sup>7</sup> Sass writes: “In my view, the experience of many schizophrenic patients involves not an overwhelming by but a detachment from normal forms of emotion and desire, not a loss but an exacerbation of various forms of self-conscious awareness.” (1994, p. 12). While not the Freudian primary process, the Dionysian is the converse: the self becomes consumed by the endless internality of its own ground-less subjectivity. It struggles for consistency by weaving the flotsam of fragmented experience into a delusional barge.

<sup>8</sup> It is ironic that Freud, whose association of primitivism and psychosis is frequently the target of the Apollonian viewpoint, anticipated some of the Apollonian observations: “There is the tendency of the modern poet... to fragment his ego into part-egos through self-observation and thereby to personify the conflicting streams of his own mental life into many heroes.” (Vol. 10, p. 177).

altogether. Advocates of the latter approach are Binswanger and his philosophical colleague, Szilasi, who borrow from Husserl, but also rely to a certain extent, on the phenomenologists, E. Straus and V. von Weizsaecker. Binswanger and Szilasi regarded psychosis as a “natural experiment” (Binswanger, 1960) which enabled the researcher to examine the deeper, more unconscious levels of processing. It is as if layers of our experience were suddenly exposed in beginning schizophrenia, layers that otherwise would not be accessible due the protective role that common sense plays in our everyday experience. They conclude that patient is deprived of common sense, the simple presumption (for which, indeed, there is no ultimate evidence) that experience will continue in the same manner that it has up to the present.

Both traditions propose that the loss of common sense - in which the paradoxes and contradictions implicit to everyday experience are “overlooked” (von Weizsaecker, 1968) - is core to schizophrenia. However, each of these traditions explains the loss of the common sense relation between self and world in schizophrenia differently. For the Apollonian tradition (Minkowski, Sass, Cutting), common sense deteriorates under the duress of hyperconcentration.<sup>9</sup> The Dionysian

---

<sup>9</sup> “The loss of natural self-evidence in negative symptom patients is, in fact, often accompanied by exaggerated forms of self-conscious awareness (hyperreflexivity) in which patients focus on aspects or processes of action and experience that, in normal experience, would simply go unnoticed.” (Sass, 2001, p. 259). Sass attributes Blankenburg’s description of the loss of common sense to “negative symptom patients” (2001, p. 259), and comments that Blankenburg neglects the positive symptoms. In addition, he calls Blankenburg’s approach “static.” However, these observations are not entirely accurate. Blankenburg developed the concept of loss of common sense in schizophrenia to describe the fundamental feature of schizophrenia in its most “symptom poor,” but possibly basic manifestation, i.e., in the relatively rare *dementia simplex* or *schizophrenia simplex*, first described by Diem in 1903 (Mishara, 2001). That is, he felt that it was fundamental to schizophrenia rather than a particular subtype. When Blankenburg (1969; 1971) developed the concept of lost common sense in schizophrenia, the term negative symptoms was not yet in vogue. The nineteenth century British neurologist Hughlings-Jackson was among the first to describe “negative” symptoms, i.e., symptoms which are abnormal by their absence, in neuropsychiatric disorders. However, it was Strauss and colleagues (in 1974) who adopted the Jacksonian terminology to describe the phenomenology of the symptoms of schizophrenia without commitment to Jackson’s theoretical views. Elaborating on this distinction both Crow (in 1980), and Andreasen (in 1982) explored the possibility that the positive negative distinction could

approach (Binswanger, Blankenburg, von Weizsaecker) attributes the erosion of common sense, coming from below, to a disruption of pre-attentive, automatic processing. The disruption in the being in the world of the patient occurs from below. This is what Blankenburg, following Husserl, Binswanger but also von Weizsaecker, calls the pre-predicative realm of meaning in the connection between self and world (in terms of Husserl's concept of pre-predicative, passive syntheses. (See Mishara 1990, 1997, 2005). The patient attempts to piece together experience by means of delusions in terms of the remaining fragments.

Blankenburg (1969; translation 2001) observes that common sense rests on 'judgments' of the probable rather than what we can directly ascertain as true. "Vico had emphasized that just as science is concerned with the truth, so *common sense* is concerned with the *probable*." (2001, p. 306). It is this inability to entrust oneself to the probable or to reckon with it in one's judgment that is withdrawn from patients with schizophrenia. Blankenburg gives the example of a 20 year-old, female patient with the relatively rare subtype, *schizophrenia simplex* (whom I have quoted above in the first section of this paper). The patient is overwhelmed with as simple a decision as which dress to wear for an occasion. She becomes tormented with indefinitely many details. This state makes a final decision impossible:

... why it should be precisely this color and this material for this occasion. It is quite easy to see how this becomes an endless undertaking. After all, the particular qualities that one finds pleasing in the material of a dress are, in part, complexly determined by processes of social judgment. We should not suppose that it is possible

---

be useful in subtyping schizophrenia, but later found it to be more useful in grouping symptoms rather than persons with the disorder. It is also incorrect to state that Blankenburg's concept is predominantly static. Blankenburg wrote numerous studies of the formation of delusions and hallucinations (later to be identified as positive symptoms) in schizophrenia from a dynamical viewpoint. Common sense is itself formed in a dynamical or dialectical relationship of self and world. Blankenburg's sources, Binswanger (1957) and von Weizsaecker (1968), believed that the self as being-in-the-world is a "dialectical" process of self-transcendence in which the boundaries between inner and outer, conscious and unconscious are continuously shifting in terms of a shifting threshold (*Schwellenabilitaet*, von Weizsaecker) relative to the total situation (See Mishara 1994, 1997).

to completely analyze – i.e., without remainder – these processes into their component parts... They are the kinds of experiences that resist being subsumed under unambiguous, rational definition. (p. 309).

If one requires certitude in the proper domain of the merely probable (as in Blankenburg's patient attempting to select a dress for a special occasion), then one attempts to construct with controlled effortful processing what is available to others as a matter of "subtlety of feeling," i.e., what is intersubjectively acceptable but not accessible to direct rational analysis. It is possible to interpret this disruption of common sense from either the Apollonian or Dionysian viewpoints. From the former viewpoint, it is possible to state that her reasoning powers have remained intact. However, her need for certainty concurs with a hyper-reflexive stance which prohibits the imprecise kind of common sense judgments which rest on social feeling or a sense for what is appropriate. From the Dionysian viewpoint, the ability to make common sense, social judgments based on feeling have already withdrawn due to a pre-attentive disruption in connectivity between embodied feeling and judgment. Blankenburg (1969; 2001) writes:

Affectivity and the ability to judge, as we find it in *common sense*, refer back to an original unity of thinking, feeling, and feeling in human existence, which is primarily related to an intersubjective world (*mitweltbezogen*). (p. 307).

The latter Dyonsian view anticipates more recent neuroanatomical accounts of emotion which involve the integration of information about the internal milieu with information about the external world: "A process such as emotion involves specific interactions between afferent information from the external environment and that arising from the internal milieu. Such interactions likely take place via the complex of connections that interrelate primary and association areas ... with limbic regions..." (Pandya and Yeterian, 2001, p. 52). We shall return to these neuroanatomical theories and how such connectivity may be disrupted in schizophrenia in latter sections of the paper.

In summary, the loss of common sense in schizophrenia has been interpreted by the two rival approaches in phenomenological psychiatry: 1. a hyperconcentration destroys or erodes common sense by requiring too much precision; 2. probablistic reasoning underlying common sense

is itself disrupted. Common sense fails because of a disruption to perceptual and automatic processing of meaning “from below”, including probabilistic reasoning which may be mediated by subcortical structures such as the basal ganglia (Mishara, 2001,; in press). This results in a fundamental *inability to rely on automatic processing* and the patient compensates by effortfully constructing meaning bottom up, from the remaining fragments of experience. In response to the Dionysian critique, Sass (2001) coined the term “operative hyper-reflexivity,” which disrupts the tacitness necessary for passive synthesis.”(2001, p. 262).

In evaluating the usefulness of these concepts, it is fair to say that both traditions have not been studied scientifically in terms of experiments. The Apollonian model places reflexive awareness as central to schizophrenia. However, this assumption is hard to operationalize and remains untestable. Moreover, there is little experimental evidence up to this point to support this assumption. Most experimental evidence indicates, rather, that attentional processing is not intact in schizophrenia. The pronounced deficits in sustained and selective attention and the recruitment of brain areas guided by top down processing have been reliably demonstrated in numerous experimental studies. This suggests that many of the effects in schizophrenia (i.e., positive and negative symptoms, neurocognitive deficits and abnormalities) would not be due to too much concentration but its absence. Supporting the Dionysian view, the distractability and attentional capture in patients with regard to fragments of experience not relevant to current goals may be secondary to abnormal salience and disrupted mesolimbic dopamine function (Gray, Kapur, Grace), i.e. pre-attentional factors rather than the result of hyperreflexivity (see Mishara, 2005).

In what follows, I will try to state how the phenomenological bracketing of common sense to examine the “underlying structures” is a “phenomenology of the unconscious” in which our current metaphysical oppositions have been bracketed. This is the “Dionysian path.” Kafka has undertaken a similar “archaeology” in his literary exploration in which the self is both subject and object of its own writing process. I will then present evidence that neuroscientific explorations of self have been driven by similar spatial metaphors of inner depth. In fact, metaphoric thinking may be an inextricable component in philosophic and scientific thinking in general. Lakoff and Johnson (1999) write that we are driven by an “unconscious metaphysics” in our conceptual thinking:

Throughout history, it has been virtually impossible for philosophers to do metaphysics without such metaphors ... That is, using unconscious everyday metaphors, philosophers seek to make a noncontradictory choice of conceptual entities defined by these metaphors; then they take these metaphors to be real and then seek out the implications of that choice in an attempt to account for our experience using that metaphysics. (p. 14).

#### **4. Kafka's Burrowing into the Earth: The inner journey of the self as underworld, The Dionysian Attempt to Access the Self from Inside**

In this section, I will raise the questions: how is it that we so naturally associate the personal self with inner or internal experience? How is it that we have come to think of the origins of the *inner* self in terms of *depth*? In this section, I will be examining the various attempts to implement an archaeology of the self in terms of the metaphor digging into the depths of the interior. The association of inner with self is not new. It pervades early Christianity and is probably connected with "common-sense dualism" that the mind is inner (not directly seen) and is somehow independent from the body. The common sense assumptions of hidden interior minds in other persons have been shown to be present from early infancy (Bloom, 2004 ). However, the association of inner self with depth is relatively modern.

The German romantic poet, Novalis writes: "The seat of the soul is there where the inner world and outer world meet." (*Schriften 2*, 419, Nr. 19, cited by Kurz, 1980, p. 209, my translation). This modern view is preserved in our current constructions of self in cognitive neuroscience (see below). There were of course foreshadowings. The early Renaissance figure, Petrarch, for example, would have his servants escort him to a cave on his small estate at Vacluse, where, in the pitch black of night, he alone could confront his fears. In doing so, however, he anticipated writing about it and thus gain fame and eternity with his esteemed classical authors. There was no rift between writer with reader or the writer with himself. The fear was still primarily external. The modern preoccupation with self as inner and deep was not born from Apollonian, detached reflection of hyperconcentration or from an aerial perspective (as Merleau-Ponty describes his friend Sartre's philosophic position) but rather, a Dionysian descent in which the self could become dissolved in

its own origins. By the turn of the nineteenth century, the image of descending into a mine-shaft as symbol of an inner but terrifying and endless journey of the self in the writings of Arnim, Hoffmann, Jean-Paul, Novalis, Tieck had become prevalent in German Romantic writers (Kurz, 1980). The overlapping of inner and depth inspired the "depth" psychological probings of Nietzsche, Freud, Jung, and even Husserl (Mishara 1990). In Freud's archaeology of the unconscious, literature and art are used as tools to explore the inner world (Kurz, 1980). Although Freud engaged in the self-analysis of his dreams, his exploration of the inner self was more detached, from above, more Apollonian than Dionysian. Kafka, however, compares his own writing activity with mining the inner world of the self: writing is self-reflexive in which the writer is both subject and object, a Dionysian activity at night which opens the endless inner darkness of the self as an abyss without bottom. In his *Diaries*, he describes his writing at night as being performed "entirely in darkness, deep in his workshop." (*Tagebucher*, p. 518, cited by Kurz (1980), p. 18). Unlike the medieval neoplatonic tradition of Christian mysticism (e.g., Johannes Scottus Erugena, Pseudo-Dionysus) in which "inner" is associated with the consolation of Christ's presence symbolized by light, inner mental life in the modern world becomes associated with the underworld, the unknown, darkness and dreams. In "The Pit of Babel," Kafka writes:

What are you building?-I want to dig a subterranean passage. Some progress must be made. My station up there is much too high. We are digging a pit of Babel. (p. 35).

In his short stories, such as "A Dream," "A Hunger Artist," and "The Burrow," digging into, or merging back into the earth exert an insuppressible attraction on the protagonist. In "A Dream," Kafka (1983) describes an unsuspecting walker, K. who observes from a distance a "freshly heaped gravemound."

This grave mound exerted almost a fascination over him and he felt he could not reach it fast enough.

Out of the bush came at once a third man, whom K. recognized immediately as an artist. (p. 399).

It is as if dreamer (the walker, K.) and artist are inextricably entangled.

While not quite the same person, they are also unable to separate or move independently from one another:

All his earlier vivacity had vanished. That made K. embarrassed too; they exchanged helpless glances... At last K. understood him... with all his fingers he dug into the earth which offered no resistance; everything seemed prepared beforehand; a thin crust of earth had been constructed only for the look of the thing; immediately beneath it a great hole opened out, with its steep sides into which K. sank, wafted onto his back by a gentle current. And while he was being received into its impenetrable depths, his head still straining upwards on his neck, his own name raced across the stone above him in great flourishes. Enchanted by the site he woke up. (pp. 400-401).

Here, self-depiction in art hardly takes an Apollonian turn. Rather, the self attempts to merge with its inner origins which is also its ultimate fate.

In Kafka, Freud and Husserl's archaeology of self, the depths of the unconscious is associated with the past or primitive (Mishara, 1990).

Kafka had required from his writing that it be rooted in past centuries. He preferred that his stories be read as ancient tales – histories of a self that is imagined on as an enormous 'tenement house' which has grown over "indestructible medieval ruins" ... Walter Benjamin had rightly characterizes the prehistoric world as Kafka's secret present." (Kurz, 1980, p. 33, my translation).

The journey to the interior of the self as endless descent to an underworld as suggested by Kafka's stories, "A Visit to the Mines," and "Hunter Graccus," is also reflected in contemporary existential thought. Jaspers had compared inner reflection to a conversation or a journey in which one cannot predict one's destination from one's starting point. The discovery of the inner as boundless and dangerous is also reflected in Jung's work. In the 1960's, the metaphor of inner journey and rebirth was sometimes used in the experimentation with psychedelic drugs. The phenomenological psychiatrist Wyss (1973), who had trained with both Jaspers and von Weizsaecker, writes:

Self-perception, the inner world appears primarily dark... In self-

perception, there emerges from the darkness, “from out of the depths,” phenomena such as memories, images, thoughts, moods, which enter and disappear from the horizon of waking consciousness as a ‘stream of consciousness.’ (pp. 166-7, my translation).

Similarly, for reasons that are too complex to examine thoroughly here, Wyss connects inner with a boundless loss of perspectivity in which the possible overwhelms the actual:

The inner appears to wakeful awareness as the inter-weaving (In-Einander) of thoughts, impulses of volition, moods, images, feelings which penetrate one another and are experienced as not independent from one another, but rather somehow, everything is interconnected with everything else – on the basis of the aperspectival structure of interweaving of what is possible. (p. 188)

Inner is psyche or mind but in the same way that Bloom (2004) indicates that we are compelled by our particular nature to be “common sense dualists.”

Sartre had identified consciousness with boundless freedom, a nothingness which is condemned to continually sever itself from what just was in a process of self-transcendence towards the unknown (see Mishara, 2004). Jung describes self-knowledge or inner growth to be symbolically the rebirth of the self. As in Kafka’s Dionysian absorption of the self into its own underworld, or Jung’s description of the symbolic journey of the self as death and rebirth, existentialists describe the self as condemned to its own process of self-transcendence, becoming other to itself. For von Weizsäcker, human self-hood accomplishes itself by surrendering to an ongoing process of self-transcendence or becoming other to oneself:

.... We first notice subjectivity only when it threatens to disappear in crisis... Subjectivity is not a firm possession, but rather one we must constantly acquire anew to possess it. (1968, pp. 172-173, my

translation).<sup>10</sup>

### 5. Mapping Cognitive Function on Brain Cytoarchitecture: Inner Experience is Associated with Depth in Mesulam's Schema

In the journey to the interior of the self from within (Dionysian absorption into origins, rebirth), the verticality of descent, or of archaeological exploration, is meant metaphorically: to descend to the depths of the self is to discover its origins in the unconscious. The Apollonian view is also vertical but examines all from above, schizoid detachment, an overview, a loss of the vivid energetics of the Dionysian sources, but preserves the self from its engulfment in maternal origins (as in the Sartrean ambivalence or the aerial attitude). Metaphors of above and below become superimposed onto the opposition internal vs. external but preserved in a murky and imprecise manner in common sense. Once unraveled they embroil the self in the loss of orientation of psychosis in which metaphors are taken literally or too precisely no longer shielded by the protective, self-concealatory function of common sense.

Although some researchers experimented on themselves to perform sense-physiological experiments (e.g., cutting one's own nerves or wearing prism glasses), or deliberately trying to mimic madness through pharmacological, "psychotomimetic" agents, most approaches to

---

<sup>10</sup> The German language tradition of phenomenological-anthropological psychiatry has only been partly translated and is largely unknown to the Anglo-American philosophical and psychiatric approaches. Although there are points of convergence between these traditions, the vocabulary and concepts of phenomenological psychiatry may at first appear cumbersome and overly complex. Based on von Weizsaecker's concept of "Gestalt-circle" (*Gestaltkreis*) between opposing or dialectical processes, e.g. perception and movement, self and other, Binswanger defines "being-in-the-world" (adopted from Heidegger) as an ongoing task of self-transcendence. This is accomplished only by overcoming "crisis," which literally means "separation" (from the Greek), here the separation of perception and movement and resultant cleft between self and world (or other). Blankenburg (1995) also acknowledges a debt in his own work on embodiment and psychopathology to von Weizsaecker's concept. There is an ongoing (though often unacknowledged) influence of von Weizsaecker in Merleau-Ponty's later concept of embodied self as "flesh" or "chiasm": a "dialectical" relationship in which the conscious Gestalt (the intentional "object") is the ongoing vital connection between self and world (in a "Gestalt-circle").

cognition and brain in the neuroscience and neuropsychological traditions have not been internal. Rather, they approach the brain from without, externally viewing the brain as an object in which cognitive functions can be mapped spatially onto its neural architecture. Thus, the neuroscientific approach to the disruption of subjective allocation of internal vs. external sources of experience in schizophrenia is “where” in the brain (both functionally and structurally) this disruption occurs. We must examine (from without) how the brain is able to differentiate internal from external, how it fashions the privacy of the human self as couched within the internal as uniquely separate from the surrounding world.

The division of soul (in Greek psyche, breath of life, vital source) into separate, often conflicting faculties has a long history in Western thought. This is evident in Plato’s oft-cited tripartite division: the rational (*logistikon*, although divine in origin is located in the head or brain (*encephalon*), the “sprited” (*thymoeides*, located in the breast), and the appetitive (*epithymetikon*, located in the abdominal cavity). Although the brain as controlling center for the body may be found in the fourth century B.C. writings of Hippocrates (Finger, 2000), the idea that cognitive functions can be mapped onto specific areas of the brain is relatively recent. It was not until the turn of the nineteenth century that the idea that specific mental functions could be located in areas of the brain took hold (most notably, in Gall’s phrenology) (Breidbach, 2001, p. 8). In early twentieth century Berlin, Brodman made ample use of the new methods for the staining and slicing of neural tissue to construct cytoarchitectural maps (cortical areas defined on the basis of cell stains) in his studies of comparative neuroanatomy between species. He based his maps on observations of microscopically detected lamination patterns in the Nissl stains “based on a sampling of levels in one or another plane of section.” (Swanson, 2000, p. 82). “The laminar pattern of a cortical area is represented by its sequence of layers, varying in cell density.” (Amunts et al., 2002, p. 34). Although Brodman and others “took architectonic localization for granted” (Amunts et al., 2002, p. 34), cognitive functions are not easily superimposed onto the cytoarchitectural structural maps for several reasons: 1. “... it is unclear how tight the structure/function relationship is, that is, whether there is a detailed relationship between cytoarchitectonic fields and their computational properties.” (Ingvar and Petersson, 2000, p. 115). 2. Because we parcel cognitive functions according to the faculty-psychology and neuropsychological measures, it

does not follow that the brain must operate according to the same systems that we fractionate cognition. 3. "... some brains have topographical landmarks which differ from those of the brain illustrated by Brodman, and since there are substantial interindividual differences in the distribution of cytoarchitectonic areas, even when sulcal and gyral landmarks are identical." (Mesulam, 2000, p. 3). In order to conduct group studies in, for example, functional neuroimaging, one must "transform the individual brains into standardized anatomical space, and onto a standardized anatomical template." However, "it is unlikely that a unique point-to-point transformation can be defined from one brain to the other in a meaningful way." (Ingvar and Petersson, 2000, p. 115). 4. Ultimately the temporal dynamics of cognitive function is mapped onto the spatial relationships of brain (i.e., in terms of a spatial coordinate system) in which proximity and long range connections enable connectivity, and thereby "communication" between neurons. 5. The participation of any brain area in a cognitive task is sufficient but not necessary – as in lesions, we can remove or extract a brain area to disrupt a specific cognitive function. On the other hand, we cannot remove this anatomical part from the brain or for that matter the brain from the body and have that part perform the cognitive function..."... by applying recent 3-D probabilistic atlas systems, the combined analysis of architectonic maps and functional imaging studies allows the testing of the functional relevance of architectonic parcellations, and the systematic search for new, functionally relevant cortical areas." (Amunts, 2002, p. 45).

Nevertheless, a second "functional school" (Broca, Campbell, Filimonov, Sanides, Yakolev, among others) developed side by side with the refinement of the neuroanatomical maps based solely on information derived from brain tissue. Depending primarily on behavioral, physiological and lesion studies, it parceled the cerebral cortex into five major subdivisions: "limbic, paralimbic, heteromodal association, unimodal association, and primary sensory-motor" (Mesulam, 2000, p. 3). These five cortical zones "display a gradual increase in structural complexity and differentiation." (Mesulam, 1985, p. 2). Their increasingly complex cytoarchitectonic differentiation reflects a progression of information about the organism's *internal* milieu to sensory information about extrapersonal space *external* to the organism. Thus, at the bottommost pole of Mesulam's ascending ladder of

functional zones are the “*core* ‘limbic’ structures” (p. 12, my emphases), composed of corticoid (cortex-like) and allocortical areas. These stand in closest relationship, i.e., have the most reciprocal neural connections, with the hypothalamus, which is responsible for maintaining and informing the organism about its *internal* milieu, motivational state, etc.

In keeping with these functions of the hypothalamus, the cortical areas of the limbic zone assume pivotal roles in the regulation of memory, emotion, motivation, hormonal balance, and autonomic function. (Mesulam 2000, p. 12).

Thus, the lowest rung on Mesulam’s “hierarchical” ladder of cortical areas is also the *deepest* “core” part of the cortex. It may be said to be responsible for imparting the organism’s experience of *inner*. More closely resembling Freud’s impersonal id, it can hardly be said to be coextensive with the location of human self.

By corticoid, Mesulam was referring to parts of the basal forebrain (the septal region, substantia innominata and parts of the amygdaloid complex) so far as these are situated directly on the ventral and medial surfaces of the cerebral hemispheres:

... the simplest and most undifferentiated type of cortex in entire forebrain. (1985, p. 2)

In some corticoid areas..., the organization of neurons is so rudimentary that no consistent lamination can be discerned and the organization of dendrites is haphazard. (Mesulam, 2000, p. 4).

The next stage, but still within the core limbic structures, is the allocortical organization. This

contains one or two bands of neurons arranged into moderately well-defined layers... There are two allocortical formations in the mammalian brain: (1) the hippocampal complex... which also carries the designation of ‘archicortex’; and (2) the piriform or primary olfactory cortex, which is also known as ‘paleocortex’. (2000, p. 4).

Since this terminology will be discussed further in the following section, I will proceed with describing Mesulam’s vertical scheme of cortical architectonics and function from inner to outer.

The next level of structural complexity is the “mesocortex.” As its name suggests, it stands as the transition zone between the more simply structured “allo” (i.e., *other* cortex (O. Vogt, 1910) (variously termed the cortex incompletes (Filimov) and the heterogenetic cortex (Brodman, 1909)) and the full six-layered isocortex, the neo- or cerebral cortex (also called cortex completes, and homogenetic cortex, respectively). The isocortex comprises 95% of the adult human brain and maintains the six-layered architecture it possessed during fetal stages. The mesocortex zone is composed of two sub-divisions or levels: 1. periallocortex: the transition zone closer to allocortex; 2. proisocortex: that transition zone closer to isocortex. In addition, the mesocortex is comprised of 2 paralimbic belts, one that is olfactocentric and stems from the simpler paleocortex, and the other, hippocampocentric, stemming from the archicortex. These play an important role in evolutionary accounts of inner and outer experience in the human brain and will be discussed further in the next section.

We are now able to ascend to the six-layered isocortex, which is itself comprised of three zones: high order (heteromodal) association areas, the modality specific unimodal association areas, and finally, the primary sensory and motor areas. The first of these zones, the heteromodal association area, is what we would naturally imagine to be highest on the vertical ladder because it comprises the *highest* cognitive functions, across sensory modalities. It is precisely in the middle of the scale, however, because it is what mediates internal milieu and external experience conveyed by the “higher” primary sensory and unimodal association areas. The predominant sensory inputs to heteromodal association areas are from unimodal areas or other heteromodal areas, are in prefrontal cortex, posterior parietal cortex, lateral temporal cortex, and portions of the parahippocampal gyrus. Unimodal areas, which respond primarily or exclusively to a single sensory modality, are for vision, for example, peri-striate and infero-temporal cortices, and superior temporal gyrus for audition in humans. Although the heteromodal association areas may be considered higher in terms of cognitive function, the unimodal areas are considered a rung above the heteromodal areas in the Mesulam schema:

(I)n general, the unimodal areas have more differentiated organization, especially with respect to sublamination in layers III and V,

columnarization in layer III, and more extensive granularization in layer IV and layer II. On these architectonic grounds, it would appear that heteromodal cortex is closer in structure to paralimbic cortex and it provides a state of cytoarchitectonic differentiation intercalated between paralimbic and unimodal areas. (Mesulam, 2000, p. 11).

The apex of the scheme are the highly specialized structures of the primary sensory-motor zones: primary visual, auditory, somatosensory and motor cortices. Displaying the highest levels of granularization and lamination,

the visual, auditory, and somatosensory systems provide the major channels of communication with the outside world.... The vestibular, gustatory, and olfactory ... primary areas are less differentiated, smaller and closer to limbic structures. .... The primary olfactory cortex is a core limbic region located at the confluence of the insular, orbitofrontal, and temporopolar areas. (2000, p. 11)

This completes Mesulam's vertical schema of brain function which equates the conveyance of internal information with simpler, perhaps, more primitive brain cytoarchitecture and external perception with the most complex, and differentiated brain structures.

Now that we have a schema of brain function which associates inner with lower and deeper, we are in a better position to examine what systems or brain areas may be affected in the inability to distinguish inner from outer sources of experience in schizophrenia. First, however, we must examine how this schema refers to a prevailing theory of brain evolution.

## **6. Digging into the interior of the brain as origin: The dorsal and ventral trends of cortical architectonic differentiation**

The dual origin view of the primate cerebral cortex was first proposed for primates by Sanides (1969; see discussions by Cummings and Mega, 2003, Mega and Cummings, 2001; Mesulam and Mufson, 1985; Pandya and Yeterian 1985, 2001). In this view, the cerebral cortex evolved from 2 anatomical moieties, the archicortex or hippocampus, and the paleocortex or olfactory cortex. These were described above as belonging

to the first rung of Mesulam's schema, the limbic allocortex. These areas

... did not show six layers and are considered to be representatives of a primitive type of cortex from which the neocortex evolved.<sup>11</sup> Sanides ... put forward a new concept of neocortical evolution contemplating the entire neocortex as a set of concentric rings, or different waves of progressive differentiation extending from the most primitive of areas. (Valverde discussion comment, 2002, p. 466).

From each of the two moieties, the two paralimbic belts or lines of progressive laminar differentiation can be followed through adjoining the periallocortical and proisocortical regions which together comprise the mesocortex. These trends or waves of increasing complexity emerge in the transition from allocortex to isocortex through mesocortex.

The first paralimbic belt with an olfactory allocortical focus (orbitofrontal centered belt) comprises the more rostral olfactory piriform paleocortex, unites the orbitofrontal insular and temporal polar regions, and extends into subcallosal or subgenual cingulate and is closely associated with the amygdala. The second belt with hippocampal focus (archicortex) embraces the parahippocampal, retrosplenial, cingulate, and subcollosal regions. There are thus two major divisions in the limbic system: a paleocortical division with the amygdala and orbitofrontal cortex at its center, and an archicortical division with the hippocampus and cingulate cortex at its center. While the terminology may be confusing, the main point here is that the metaphor of a core or inner depth surrounded by layers with increasing complexity is preserved in this theory of brain evolution.

Interestingly, it is on the basis of Sanides scheme that Cummings and Mega (2003; Mega and Cummings, 1997) conclude that most

---

<sup>11</sup> The precise evolutionary interpretation of these brain structures remains controversial. Gloor (1997) warns against evolutionary interpretations of brain which compares depth or core with primitive and neocortex with advanced: "the time-honored terms like 'archi- and paleocortex' for hippocampus and piriform cortex, respectively, and neo-cortex for isocortex... suggests that mammalian archi- and paleocortex are primitive survivors of an earlier period... However, mammalian neo-cortex has just as ancient phylogenetic roots as the hippocampal and piriform allocortex... " (p. 27). Therefore, we must be careful of associating inner/ deeper with more primitive vs. advanced when making inferences about the cytoarchitectonic structure of the brain.

neuropsychiatric disorders involve abnormalities of limbic function:

Neuropsychiatric disorders may be interpreted within a brain-based framework of limbic dysfunction divided into three general groups: decreased, increased and distorted limbic syndromes. (Cummings and Mega, 2003, p. 16)

They propose that the first olfactocentric, paleocortical belt, or amygdala-orbitofrontal division, is more concerned with conveying information about the organism's internal milieu and motivational state often in an implicit and visceral manner:

No visual information has direct access to the medial division of the orbitofrontal cortex that serves as an integrator of visceral drives while modulating the organism's internal milieu. (2003, p. 10)

The "more recent" archicortical hippocampal-centered belt (see Pandya and Yeterian, 1985, p. 192), on the other hand, is the externally directed evaluative arm of the limbic system.

Processing in the amygdala-orbitofrontal division concerns the internal relevance that sensory stimuli have for the organism, thus facilitating intentional selection, habituation, or episodic encoding of these stimuli by the hippocampal-cingulate division. (*ibid.*)

they thus attribute the following functions to the processing of internal information of the amygdala-orbitofrontal circuitry: implicit processing, visceral integration, visual feature analysis (i.e., ventral trend), appetitive drives, social awareness, and mood. The hippocampal-cingulate circuitry, mediating external orientation, has the following functions: explicit processing, memory encoding, visual spatial analysis, skeletomotor effector systems, attentional systems, and motivation.

Both divisions of the limbic system work in concert. (Cummings and Mega, 2003, p. 10)

The orbitofrontal and hippocampal centric belts intersect in the infracallosal cingulate region of Brodman area 24... thus Area 24 is a nexus in the distributed networks subserving internal motivating drives and externally directed attentional mechanisms. (Cummings and Mega,

2003, p. 12)

This area of the anterior cingulate (B.A. 24, B.A. 32) has caught the attention of numerous schizophrenia researchers (including the computational models of Braver and Cohen, 2002) for somewhat different reasons than the current focus.<sup>12</sup>

## **7. The search for the “inner world” in the brain and its disruption in schizophrenia**

Oppositions such as inner/outer, self/other, above/below, voluntary/involuntary, conscious/nonconscious, primitive/advanced inform both our common sense experience of reality as well as modern conceptual and literary explorations of the self. With regard to the hidden abstractness of our common sense and its lack of foundation, the phenomenological social scientist, Alfred Schutz (1962) wrote that “the so-called facts of common sense perception ... already involve abstractions of highly complicated nature.” Overlooking this leads to a “fallacy of misplaced concreteness.” (pp. 3-4). By means of reflection or

---

<sup>12</sup> Braver and Cohen (1999) make the observation that dopamine may play a modulatory role in providing a gating function by regulating neurons responsible for maintaining contextual representations during tasks requiring cognitive control by increasing their responsivity to new afferent input when updating is required. This may be tied to reward processing as suggested by W. Schultz and colleagues who have demonstrated transient decreases in firing of midbrain ventral tegmental area dopamine neurons following reward prediction. They state that the key role of reward prediction in the cognitive control in the prefrontal cortex (PFC) suggests “the intriguing possibility that the literature on cognitive functions of PFC and DA (dopamine) can be linked with the growing but heretofore separate literatures on the affective and motivational functions of these brain systems.” (p. 730). This is part of a growing trend in schizophrenia research to examine emotional and social aspects of information processing rather than the exclusively cognitive focus of earlier researchers. It has been recently suggested that the anterior cingulate (ACC) with its rich dopaminergic innervations may be particularly sensitive to fluctuations in reward contingencies in the environment. Deficits in motivation and learning based on reward processing may be associated with abnormalities in ACC function in schizophrenia. Cingulate gyrus abnormalities may also be linked to difficulties in mediating internal and external experience as suggested by the neuroanatomic models reviewed here.

simply inner awareness, we try to find the source of the oppositions we experience by penetrating into the depths and darkness (Wyss) of our own inner selves. The oppositions, however, remain linked precisely to the degree that their imprecise connection remains obscured by common sense. That is we find ourselves in a web of oppositions that continue to function in their imprecision precisely to the extent that we are unable to penetrate to their hidden but somehow questionable interconnectedness. One might be tempted to think that it is a result of paying too close attention to such things, a hyper-reflexivity, that such paradoxical connections begin to unravel. Yet, however much the philosopher attempts to see all from above in a detached and analytic manner, the power of her words are not enough to dismantle the seemingly impenetrable common sense ties that continues to hold us together. As Kafka notes:

For words are poor mountain climbers and poor miners (*schlechte Bergmaenner*). They do not fetch the treasures from the mountain tops nor from the mountains' deep bowels." (*Briefe 1902-1924*, p. 9, my translation).

Thus, the philosopher stands helplessly on one side of the abyss of the self and the madman (in acute psychosis) on the other. The latter holds the disconnected strands of his own experience in his hands without anyone able to guide him how they may be put back together. Perhaps, Llinas (cited above) is right after all, because it will only be through the study of brain processes that we be able to bridge this gap between our philosophical and literary efforts to penetrate the interior and the underlying brain processes that lead to psychosis. On the other hand, without the appeal to philosophy, we will continue to interpret the results of neuroscience in terms of the common sense dualisms of our folk psychologies and scientific models.<sup>13</sup>

---

<sup>13</sup> To say that mind *is* brain, or that mind is *in* the brain as is the current fashion in philosophy and neuroscience. However, such an assertion actually preserves the underlying common sense dualism that enables such facile solutions. Mind and brain, rather, as well as the other, related common sense oppositions I have enumerated, may be conceptualized as two sides of the same coin: access to conceptualizing each side momentarily excludes but also presupposes its counterpart in concealed unity (what von Weizsaecker (1968) calls a relationship of "Gestalt-circle" (*Gestaltkreis*) (see Mishara,

In our search for the possible brain systems that may underlie the disconnection of inner and outer in schizophrenia and their exaggerated separation in compensatory delusions, we must ask how the hidden connection between internal information and outer experience is maintained in the brain. One could argue that such a relationship pervades the entire cortex. Pandya and Yeterian (2001) trace the feedforward and feedback connections that serve as basis for communication between information of internal and external origin: Feedforward processes convey external information from sensory cortices; Feedback processes from limbic areas convey back internal information to the sensory areas. Moreover, they state that

... the cerebral cortex as a whole can be viewed as composed of dorsal and ventral trend regions, and that the overall patterns of connectivity are consistent with the notion of dual cortical trends. (p. 74)

A process as specific as emotion involves specific interactions between afferent information from the external environment and that arising from the internal milieu. (p. 52)

They propose that the ventral stream subserves the subjective experience of feeling (i.e., internal information), whereas the dorsal stream

---

1994) and Husserl calls realms of cognition with their own legitimacy but “abstracted” from the unity of embodied experience. Metaphoric thinking is an inextricable component of philosophic and scientific thinking. It is in the foreground and therefore part of the legitimate discourse in “human sciences” but operating more unconsciously, and thus, in the background, in natural science approaches. The two approaches are methodologically distinct in their directionality: natural science proposes explanation in which constructs are explained on the same level or reduced to a more fundamental level: in neuroscience, for example, behavior is explained in terms of the recruitment of brain systems or networks, themselves resting on populations of neurons, which in turn rest on molecular processes of gene expression, etc. On the other hand, “human sciences” (“Geisteswissenschaften” as interpreted by Dilthey, or Gadamer) proceed from smaller units such as a cognition or interpretation to their contexts in (historical, pre-judicial or embedded embodied) understanding in terms of a hermeneutic circle between currently grasped part and its only partially understood contextual or transcendent whole. Husserlian phenomenology found a middle path in which the respective abstract domains (physis, bios, psyche, and culture (i.e., the social context of an intersubjective life-world)) or units of these domains may be related across levels without a commitment to the directionality of causality.

suberves its expression. Each stream is pervaded by feedforward and feedback connections which convey external and internal information, respectively.

The orbital and ventromedial frontal cortices (of the ventral paleocortical trend) seem to be in a particularly good position to integrate or mediate internal information with external experience.

It is notable that the orbital and ventromedial prefrontal regions are located within the ventral architectonic trend, which is involved in attaching significance to stimuli. (p. 78)

For Pandya and Yeterian (2001), this circuitry is involved in the subjective awareness of feeling. However, it is also involved in the non-conscious contribution of bodily hunches or somatic markers as is demonstrated in the oft-cited gambling task (Bechara, Damasio).

The paleocortical division of the limbic system is engaged in an unconscious affective evaluation of stimuli that occurs prior to conscious awareness of the stimulus in question. (Crespo-Facorro et al., 2001, p. 427).

Moreover, the insula (or the Island of Reil, named after the 16<sup>th</sup> century anatomist who discovered it - a mysterious often thought redundant (and primitive evolutionarily) fifth lobe of the cerebral cortex - buried deep within the brain) is intimately linked with orbital frontal areas, frontal-parietal operculum and temporal pole in the paleocortical, olfactocentric trend. Its cytoarchitectural progression is radial (in concentric perilloccortical, proisocortical and isocortical laminar organizations) with regard to these neighboring structures (see Mesulam and Mufson, 1985). It is activated by visceral sensation in a somatotopical manner. Craig writes:

... in humans a meta-representation of the primary interoceptive activity is engendered in the right anterior insula, which seems to provide the basis for the subjective image of the material self as a

feeling sentient entity, that is, emotional awareness. (2002, p. 2003)<sup>14</sup>

Citing Nietzsche, Merleau-Ponty, Sherrington and others, Damasio (2003) writes: "...mappings of the body are well suited for signifying the self in the mind." (p. 227). However, the human experience of body is not only the experience of a material self, but something beyond, it is vulnerability with regard to the unknown (Mishara 2005). That is, the self has an eccentric relation to body (Leib-im-Koerper, Plessner), its imagination is not confined to an interior of the body but an awareness that inside and outside meet at some point beyond one's comprehension – inside and outside are but two versions of the same thing as in Merleau-Ponty's (1968) description of a finger of a glove that is turned inside out:

There is no need for a spectator that would be on each side. It suffices that from one side I see the wrong side of the glove that is applied to the right side, that I touch the one *through* the other... (p. 263)

And with regard to the mind-body relationship:

The bond between the soul and body is not a parallelism ... It is to be understood as the bond between convex and concave, between the solid vault and the hollow it forms... (Ibid.)

Merleau-Ponty continues in his critique of Sartre's view of consciousness as nothingness (but could just as well be applied to the contemporary tendency to identify mind with brain in neuroscience): "The soul, the for itself is *a hollow and not a void*, not absolute non-Being with respect to Being that would be plenitude..." (1968, p. 233; for the application of these concepts to schizophrenia, see Mishara, 2005). In our conscious

---

<sup>14</sup> Bechara and Navi (2004) summarize the debate: "Damasio and Craig agree that the right anterior insular cortex is important in mapping visceral states and in bringing interoceptive signals to conscious perception. However, Craig suggests that this region also translates the visceral states into subjective feeling and self-awareness. In Damasio's view, a first-order mapping of 'self' is supported by brainstem regions, insular cortex and somatosensory cortex. However, additional regions, such as thalamus and anterior cingulate cortex, are required for second-order mapping of the relationship between organism and emotional object and for integration of information about the body with information about the world." (p. 103)

awareness of body, interoception and exteroception may be experienced independently but are also inextricably linked (as we find with the other common sense oppositions). Is it possible that when we describe a loss of common sense in patients with schizophrenia, they are deprived of precisely this integration of embodied emotional affect with internal awareness, i.e., gut feelings that help guide our behavior and that we have seen to be irreducible to rational analysis and to be at the root of common sense?

Thus it would seem that the areas involved in the mediation of internal feeling and external stimuli might be implicated in the disconnection and thus confusion of internal and external experience in schizophrenia. The realization that the abnormalities of schizophrenia may not just be cognitive involving executive function has lead researchers to examine in structural and functional neuroimaging the more emotional areas of the brain including the orbitofrontal areas, cingulate gyrus, insula, amygdaloid complex and temporal pole. Although there are numerous efforts in this direction, I will mention only one study.

### **8. Disrupted embodied awareness of self in schizophrenia: the disconnection of internal and external experience**

Using high-spatial resolution magnetic resonance imaging, Kasai and colleagues (2003) measured the gray matter volumes of “two olfactorcentric paralimbic regions of interest, the insular cortex and the temporal pole” in first-episode patients with schizophrenia, compared with first-episode affective psychosis and normal controls. It was found that bilateral insular cortex gray matter volumes were significantly reduced in the schizophrenia patients compared to the other groups. However both first-episode groups showed abnormalities and volume reductions in left temporal pole gray matter.

Our results suggest that anterior (more allocortical) and posterior (more isocortical) insulae were selectively reduced in schizophrenia, whereas volume reductions in the temporal pole (mixture of allocortical and isocortical sectors) are common to both psychoses. (p. 1074)

The authors acknowledge the limitations of their method:

Although MRI is not capable of resolving cortical architectonics, it can detect differences in gray matter volumes of ROIs whose cortical structure has been characterized by postmortem architectonic studies; such studies have characterized the paralimbic zone as consisting of a transition between a simple allocortex, such as the hippocampus, and a fully developed, 6-layer isocortex. (p. 1070)

In the attempt to understand brain function and its disruption in schizophrenia there is renewed interest in the cytoarchitecture of the cerebral cortex and theories of its evolutionary development. In the current paper, I have attempted to find links between philosophical, literary and neuroanatomical sources of evidence to examine the possible causes of why patients with schizophrenia demonstrate an inability to distinguish internal from external sources in some experiences. I have suggested that this is due to the loss of common sense which otherwise maintains internal and external experience in concealed relationship or unity. In doing so, I have suggested some neural pathways that could be linked with phenomenological and neuropsychological evidence of brain dysfunction in schizophrenia.

Yale University School of Medicine

## REFERENCES

- Amunts, K., Schleicher, A., and Zilles K. (2002). Architectonic mapping of the cerebral cortex. In: Schuez, A and Miller, R (Eds). *Cortical areas: unity and diversity*. London: Taylor & Francis, pp. 29-52.
- Bechara A., Navi, N. (2004). Listening to your heart: interoceptive awareness as a gateway to feeling *Nature Neuroscience* 7, pp. 102 - 103.
- Binswanger, L. (1957). *Schizophrenie*. Pfullingen: Neske.
- Binswanger, L. (1965). *Wahn*. Pfullingen: Neske.
- Blankenburg, W. (1969). Ansätze zu einer Psychopathologie des 'common sense.' *Confinia Psychiatrica* 12, pp. 144-163. (2001). First steps toward a 'psychopathology of common sense'. (Translated with commentary by A. L. Mishara) *Philosophy, Psychiatry and Psychology* 8, pp. 303-315.
- Blankenburg, W. (1971). *Der Verlust der natuerlichen Selbstverstaendlichkeit, Ein Beitrag zur Psychopathologie symptomarmen Schizophrenien*. Stuttgart: Ferdinand Enke Verlag.

- Bloom, P. (2004). *Descartes' baby, how the science of child development explains what makes us human*. New York: Basic Books.
- Braver, T. S., & Cohen, J. D. (1999). On the control of control: The role of dopamine in regulating prefrontal function and working memory. Monsell & Driver (eds.), *Control of Cognitive Processes: Attention & Performance XVIII*. Cambridge, MA: MIT Press, pp. 717-737.
- Breidbach, O. (2001). The origin and development of neurosciences. In: Machamer, P., Grush, R., and P. McLaughlin (Eds.). *Theory and method in neurosciences*. Pittsburgh: University of Pittsburgh Press, pp. 7-29.
- Craig, A.D. (2002) How do you feel? Interoception: the sense of the physiological condition of the body. *Nat. Rev. Neurosci.* **3**, pp. 655-666.
- Crespo-Facorro B, Paradiso S, Andreasen NC, O'Leary DS, Watkins, GL, Ponto, LLB, Hichwa, Richard D. (2001). Neural mechanisms of anhedonia in schizophrenia: A PET study of response to unpleasant and pleasant odors. *Jama* **286**, pp. 427-435.
- Cummings, J.L., Mega, M.S. (2003). *Neuropsychiatry and behavioral neuroscience*. New York: Oxford University Press.
- Cutting, J. (1997). Principles of Psychopathology. Two Worlds-Two Minds-Two Hemispheres. New York: Oxford University Press.
- Cutting, J. (1999). Morbid objectification in psychopathology. *Acta Psychiatr Scand* **99**, pp. 30-3.
- Esposito, N.J. (1987). Semantic satiation as a perceptual phenomenon. *Perceptual and Motor Skills* **64**, pp. 487-491
- Ferguson, M.L., Katkin, E.S. (1996). Visual perception, anhedonia, and emotion. *Biological Psychology* **42**, 131-145.
- Finger, S. (2000). *Minds behind the brain, a history of the pioneers and their discoveries*. New York: Oxford University Press.
- Freud, S. (1969). *Gesammelte Werke*. A. Freud et al. (Eds). 3<sup>rd</sup> Ed. Frankfurt am Main: S. Fischer Verlag.
- Frith, C.D. (1992). *The Cognitive Neuropsychology of Schizophrenia*. Hillsdale: Earlbaum.
- Gloor, P. (1997). *The temporal lobe and limbic system*. New York: Oxford University Press.
- Gray, J.A. (1998). Integrating schizophrenia. *Schizophrenia Bulletin* **24**, pp. 249-266.
- Huber, G. (1999). *Psychiatrie, Lehrbuch fuer Studium und Weiterbildung*. Stuttgart: Schattauer.
- Ingvar, M., Petersson, K.M. (2000). Functional maps and brain networks. In: Toga, A.W., Mazziotta, J.C. *Brain mapping, the systems*. San Diego: Academic Press, pp. 111-139.
- Kafka, F. (1967). *Briefe an Felice*. Hamberg-Wandsbek: S. Fischer-Verlag.

- Kafka, F. (1983). *The complete stories and parables*. New York: Quality Paperback Book Club.
- Kapur S, Zipursky R, Jones C, Remington G, Houle S (2000): Relation between dopamine D2 occupancy, clinical response, and side effects: a double-blind PET study of first-episode schizophrenia. *Am J of Psychiatry* **157**, pp. 54-520.
- Kasai et al. (2003). Differences and Similarities in Insular and Temporal Pole MRI Gray Matter Volume Abnormalities in First-Episode Schizophrenia and Affective Psychosis *Arch Gen Psychiatry* **60**, pp. 1069-1077.
- Kurz, G. (1980). *Traum-Schrecken, Kafkas literarische Existenzanalyse*. Stuttgart: J.B. Metzlersche Verlag.
- Lakoff, G., Johnson, M. (1999). *Philosophy in the flesh, the embodied mind and its challenge to western thought*. New York: Basic Books.
- Libet, B., Gleason, C.A., Wright, E.W. and Pearl, D.K. (1983). Time of conscious intention to act in relation to onset of cerebral activity (readiness - potential): the unconscious initiation of a freely voluntary act. *Brain* **106**, 623-642.
- Llinas, R.R. (2001). *I of the vortex, from neurons to self*. Cambridge, MA: The MIT Press.
- Mega, M.S., Cummings, J.L. (2001). Frontal subcortical circuits: anatomy and function. In: Salloway, S.P., Malloy, P.F., and J.D. Duffy. *The frontal lobes and neuropsychiatric illness*. Washington, DC: American Psychiatric Press, pp. 15-32.
- Merleau-Ponty, M. (1968). *The visible and the invisible*. Translated by A. Lingis. Evanston: Northwestern University Press. (Original French: 1964).
- Mesulam, M.-M. (1985). Patterns in behavioral anatomy; Association areas, the limbic system, and hemispheric specialization. In Mesulam, M.-M. (Ed.), *Principles of behavioral neurology*. Philadelphia: F.A. Davis, pp. 1-70.
- Mesulam, M.-M. (2000). Behavioral neuroanatomy: Large-scale networks, association cortex, frontal syndromes, the limbic system, and hemispheric specializations. In Mesulam, M.-M. (Ed.), *Principles of behavioral and cognitive neurology*, Second Edition. Oxford: Oxford University Press, pp. 1-120.
- Mesulam, M.-M., Mufson, E.J. (1985). The insular of Reil in man and monkey. In: Peters, A. and Jones, E. G., (Eds.) *Cerebral Cortex*, Vol. 4. New York: Plenum Press, pp. 179-226.
- Mishara, A.L. (1986). L'Inconscient chez L. Binswanger. In P. Fedida (ed.) *Phénoménologie, Psychiatrie, Psychoanalyse*. Paris: Echos-Centurion. Second edition, published 2004, Paris: Librairie Philosophique J. Vrin.
- Mishara, A.L (1990). Husserl and Freud: Time, Memory and the Unconscious. *Husserl Studies* **7**, pp. 29-58.

- Mishara, A.L. (1991) *Phenomenology and the unconscious the problem of the unconscious in the phenomenological and existential traditions: E. Husserl, V. von Weizsaecker and L. Binswanger*. Ann Arbor: UMI.
- Mishara, A.L. (1994). A phenomenological critique of commonsensical assumptions in DSM-III-R: The avoidance of the patient's subjectivity. In *Philosophical perspectives on psychiatric diagnostic classification..* Edited by Sadler JZ, Wiggins OP, Schwartz MA. Baltimore: John Hopkins University Press, pp. 129-147.
- Mishara, A.L. (1995). Narrative and psychotherapy - the phenomenology of healing. *American Journal of Psychotherapy* 49, pp. 180-195.
- Mishara, A.L. (2001). On Wolfgang Blankenburg, Common Sense and Schizophrenia. *Philosophy, Psychiatry & Psychology* 8, pp. 317-322.
- Mishara, A.L. (2005). Body Self and its Narrative Representation in Schizophrenia: Does the Body Schema Concept Help Establish a Core Deficit? In H. De Preester and V. Knockaert (eds). *Body Image and Body Schema*. (Book Chapter) Amsterdam: John Benjamins Publishing Company.
- Mishara A.L, Goldberg T.E. (2004). A Meta-analysis of Conventional Neuroleptic Treatment and Cognition: Opening a Closed Book. *Biological Psychiatry* 55, pp. 1013-1022.
- Mishara, A.L., Parnas, J., and Naudin, J. (1998). Forging the links between cognitive neuroscience, phenomenology and psychopathology. *Current Opinion in Psychiatry* 11, pp. 567-573.
- Pandya, D.N., and Yeterian, E.H. (1985). Architecture and connections of cortical association areas. In: *Cerebral Cortex*, Vol. 4, A. Peters and E.G. Jones (Eds.), Plenum Press N.Y., pp. 3-61.
- Pandya, D.N. and Yeterian, E.H. (1990). Prefrontal cortex in relation to other cortical areas in rhesus monkey: Architecture and Connections. In: *The Prefrontal Cortex: Its Structure, Function, and Pathology, Progress in Brain Research*, vol. 85, H.B.M. Uylings, C.G. Van Eden, J.P.C. DeBruin, M. A. Corner and M.G.P. Feestra(eds.) Elsevier Press, Amsterdam, pp. 63-94.
- Pandya, D.N. (1990). 'Friedrich Sanindes'. *Cortex* 27, pp. 307-309.
- Pandya, D.N. and Yeterian, E.H. (1996). Morphological correlations of human and monkey frontal lobe. In A.R. Damasio et al. (eds.): *Neurobiology of Decision-Making*. Berlin: Springer-Verlag, pp. 13-46.
- Pandya, D.N. and Yeterian, E.H. (2001). The anatomical substrates of emotional behavior: the role of the cerebral cortex. In: Gainotti, G. (2001). *Emotional behavior and its disorders. Handbook of neuropsychology. 2<sup>nd</sup> ed., Vol. 5*. Amsterdam: Elsevier, pp. 49-87.
- Pandya, D.N. Association cortex (1999) In G. Edelman and B.H. Smith (eds.): *Encyclopedia of Neuroscience, 2<sup>nd</sup> ed*. New York: Elsevier, pp. 138-142.
- Sass, L.A. (1994). *The Paradoxes of Delusion: Wittgenstein, Schreber and the*

- Schizophrenic Mind*. Ithaca: Cornell University Press.
- Sass, L.A. (2001). Self and world in schizophrenia: Three classic approaches. *Philosophy, Psychiatry and Psychology* 8, pp. 251-270.
- Schwez, A., Miller, R. (2002). *Cortical Areas: Unity and Diversity*. London: Taylor & Francis.
- Straus, E. (1958). Aesthesiology and Hallucinations. In *Existence: A new dimension in psychology and psychiatry* Edited by R. May, E. Angel, and H.F. Ellenberger. NY: Basic Books, pp. 139-169.
- Uhlhaas, P.J., Mishara, A.L. (2005). The perceptual field in schizophrenia: Context for delusions and disrupted self-experience? Poster presented at the conference, Phenomenology and Psychiatry for the 21st Century, Institute for Psychiatry, London, UK, September 5-6, 2005.
- Weizsaecker, V. von. (1968) *Der Gestaltkreis. Theorie der Einheit von Wahrnehmung und Bewegung*. 4<sup>th</sup> edition, unchanged from 1948 edition. Stuttgart: Georg Thieme Verlag. Reprinted in Viktor von Weizsaecker, 1998, *Gesammelte Schriften*. Volume 4. Edited by Achilles P, Janz D, Schrenk M, von Weizsaecker CF. Frankfurt am Main: Suhrkamp Verlag.
- Wyss, D. (1973). *Beziehung und Gestalt*. Goettingen: Vandenhoeck & Ruprecht.
- Yeterian, E.H. and Pandya, D.N. (1991). Corticothalamic connections of the superior temporal sulcus in rhesus monkey. *Experimental Brain Research* 83, pp. 268-284.