

Symphony of Matter and Mind

Part Eight

Dissonances of the Mind The Physics of Mental Disorders

Chapter synopsis:

1. Disintegration of the Inner Universe.

Previous parts of the research were devoted to the regularities of the normal work of the mind. They revealed the physical, physiological, and technological aspects of the formation of a coherent and adaptive reality model by the brain. This part is devoted to the systemic pathologies of the mind that result in the disintegration of the reality model and its maladaptive state. The book focuses on two major mental disorders: autism and schizophrenia. Volumes have been written about them, and vast amounts of money are allocated from public and private funds for their research. However, they are still incurable. There is a specific reason for this: cognitive sciences lack a model that would explain the disintegration of the mind. Without understanding what mechanism is broken and how it is broken, we cannot repair it.

This chapter gives a review of the current status of research on autism spectrum disorders (ASD). Psychiatry only describes a set of cognitive and behavioral manifestations, without bridging them with the physiological state of the organ that performs the functions and is in the pathological state that causes these symptoms. This is the major reason for its disability when it comes to curing the disease. The attempts to create a model that would make such a link started only by the end of the 20th century. Unfortunately, they all remain at a general descriptive level and try to explain the condition by the concepts that need a physical explanation themselves (for example, executive dysfunction or weak central coherence). Thus, they remain in a logical fallacy of circular reasoning. The problem is again the same: lack of a model that would explain the physical mechanism behind the specific cognitive functions that are in aberrant condition in ASD. To solve the problem, we need to bridge psychological and physiological levels of description with physics. After all, physiology is the implementation of specific physical mechanisms that produce mental phenomena.

2. Building Bridges.

This chapter starts to build bridges between mental and physiological phenomena in ASD. The basic assumption is simple: if specific physical mechanisms provide for the normal functioning of the mind, they malfunction in pathology. The chapter provides a solution based on the Teleological Transduction Theory (TTT) concept of the physical mechanism that creates the harmonious structure of the reality model and algorithm that the brain employs to produce the coherent flow of the mind. The chapter offers a clear hypothesis about ASD as a disorder of the brain that results in the disintegration of the mind. It also proposes a new approach to the classification of psychopathologies based on a testable assumption about the disruption of a physical mechanism. It takes specific clinical cases to illustrate the connection between symptoms and brain states. We begin to move away from the standard symptomatic diagnostic classification in psychiatry and ASD becomes a clinical subclass of a new general diagnostic category based on defining the state of the organ performing a specific function.

3. Reality Model Assembly Line.

The normal and smooth production of the reality model involves well-coordinated processes at the stages of preparation of ‘parts’ (signal conversion), adjusting them to the standards of the system (signal modulation), and assembly (integration of representations of signals). The whole system is set up to ensure that the product goes out from the ‘assembly line’ in a working state to perform its inherent functions efficiently and reliably. However, there may be failures at any stage of the assembly line. Failures in modalities of perception and even complete loss of one modality can be compensated. Failure at the stage of higher integration leads to the impossibility of creating the final product — a coherent model of reality. The chapter shows at what stage the collapse of the integrative function happens in ASD and describes what is going on with the physical activity of the brain integrators.

4. Bedlam of Psychiatry.

Undoubtedly, compared with the old notions of ‘demon possession’ or ‘curse of god’ we have advanced in our understanding of brain disorders. But when the etiology and pathogenesis are not clear, a clinical case is transferred to psychiatry with its vague terms such as psychosis (from ancient Greek ψύχῳσις — disturbed soul). In essence, this is no different from the old notions. If clinicians were honest with themselves and their patients, they would simply admit the impossibility of true diagnosis, which leads to failure in the treatment of systemic pathological conditions. Schizophrenia is one of them. It is certainly a psychosis in the sense that the normal functioning of the soul (mind) is disturbed. But to get rid of a mystical attitude to mental disorders, we need to define what kind of brain disorders they are. To overcome the ‘bedlam’ (confusion) of psychiatry, we need to understand the physical process violation which manifests itself in those symptoms that have been combined into the syndrome of

schizophrenia. The chapter starts to build bridges between the observed external pathological manifestations and their possible internal physical reasons.

5. Delicate Strings of the Soul.

There is one model of schizophrenia that can be called an attempt to take it out of the vague ‘disturbed soul’ domain — dopamine theory. It is highly popular and has been the basis of treatment practice for many years. The major problem is that it deals with only one side of the symptomatology (productive symptoms of hallucinations and delusions). It does not cure the core pathological state of cognitive and emotional function deterioration (negative symptoms). It is analogous to taking a fire alarm for the problem and shutting it off but not extinguishing the fire. The chapter offers a hypothesis about the role of the dopamine system and the cause of its ‘fire alarm’ signal in schizophrenia. This assumption has non-trivial consequences: it means that the whole industry’s approach to the main pathology of the mind should change.

The integration mechanism proposed within the TTT concept is a multiparameter process that depends not only on one type of neurotransmitter. The chapter considers the details of the delicate process of tuning the ‘strings of the soul’ at the cellular and intercellular levels. Thus, it paves the way for an explanation of the pathological state of chronic dissonance of the mind.

6. Detuned Strings of the Soul.

The modern methods of treating systemic disorders of the mind can be compared to trying to tune a violin by banging it with a hammer. It is no accident that psychiatrists call antipsychotics a ‘chemical straitjacket.’ But the name ‘chemical lobotomy’ is more precise. The chapter describes some clinical cases as examples and takes meta-analytical longitudinal studies that show the dramatic adverse effects of antipsychotic drugs on brain tissue. The use of antipsychotics is aimed at extinguishing arousal and hallucinatory-delusional states, but negative symptoms increase and patients experience further decay of mental activity. In short, current practice does not heal but cripple. This is the result of a lack of a clear model of the mind in the branch of medicine called ‘healing of the mind’ (psychiatry). The chapter offers a testable hypothesis about the underlying problem that causes the observed symptoms of schizophrenia and suggests a place for this pathology within the general diagnostic category offered in the previous chapters based purely on specific physical, physiological, and technological terms.

7. Personality Collapse.

When Eugen Bleuler coined the term schizophrenia (split mind) more than a century ago, he was trying to describe the whole set of symptoms in one word. Overall, they spoke about the disintegration of cognitive, emotional, and behavioral processes that can be described as a

collapse of an integrated Self (Personality). The hypothesis offered in the previous chapter explains this collapse by the malfunctioning of the mechanism that normally binds all aspects of reality into a coherent model and all aspects of internal subjective experiences into a unified Self. As with any scientific hypothesis, it needs to be tested against reality. The chapter reviews some past experiments and offers ideas for future tests of the TTT predictions.

8. Chaos Harmonization Project.

Theorists are architects. The experimenters are suppliers of building materials. Practitioners are builders who take materials and apply them according to the architect's project. The only criterion for testing the usefulness of the efforts of all involved is the success in a common cause: understanding the workings of the mind and treatment of its pathologies. Cognitive sciences have accumulated lots of materials but they lie around the 'construction site' without any practical use. Clinicians cannot use these materials as they do not have a project. They 'run around the site' so as not to sit idly by, and pretend that work is being done. However, without a project, the site is in a state of chaos. The project proposed in this study is an attempt to overcome chaos and start meaningful construction.

To treat pathologies, we need to perform a diagnosis of the organ. To diagnose, we need suitable measurement instruments. To act according to the diagnosis, we need tools that can be applied to the diseased organ. This is the normal course of events in any field of medicine. We have to bring psychiatry to this route. However, the above statements are too general. To achieve precision for the technologies of diagnosis and treatment of the pathologies, we should use precise physical and technological terms for describing the functioning of the mechanism to which the tools will be applied. The Teleological Transduction Theory aims to pave the way for such precise diagnosis and treatment of mental pathologies as disorders of the brain. This will harmonize our approach to the dissonances of the mind.