

Freud's 1895 Project

From Mind to Brain and Back Again

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After . . . the discovery of motor and sensory aphasia Broca and Wernicke . . . set about tracing the more subtle symptoms of aphasia . . . to factors of localization. In this way they arrived at the hypothesis of conduction aphasia, with subcortical and transcortical, and motor and sensory forms. This critical study is directed against this view of speech disorders and it seeks to introduce for their explanation functional factors in place of the topographical ones.
—FREUD (1897b [1891b])

I have not always been a psychotherapist. Like other neuropathologists, I was trained to apply local diagnoses and electro-prognosis, and it still strikes me myself as strange that the case histories I write should read like short stories and that, as one might say, they lack the serious stamp of science. I must console myself with the reflection that the nature of the subject is evidently responsible for this, rather than any preference of my own.
—FREUD (1895d)

In the intellectual itinerary that led Freud to the creation of psychoanalysis, an adventure of the mind, he began by being exposed to world literature and the philosophy and psychology of Johann Friedrich Herbart (Andersson, 1962) and Immanuel Kant in his high school days; later he attended the lectures of the Aristotelian Franz Brentano at Vienna University (Freud, 1990). After graduating from medical school Freud did a stint in psychiatry under Theodor Meynert at the Vienna General Hospital and worked as a neuropathologist, which in those days meant both neurologist and neuroscientist, investigating the anatomy of the central nervous system under the influence of the brain theories of mind held by his teachers. While working in the Institute of Physiology headed by Ernst Brücke, one of the founders of the mid-nineteenth century Helmholtz School of Physiology, he became acquainted with Josef Breuer, his future mentor and collaborator on the psychology of hysteria and its psychological treatment, catharsis, the precursor of psychoanalytic treatment. In 1883 Freud was

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told by Breuer about his case of Anna O., but it is only after he learned more about hysteria in Paris from Charcot in 1885–1886 that Freud became seriously interested in hysteria and other neuroses and in the study of mind in health and disease. The first years of the 1890s saw the publication of Freud's major formulations of the neuroses (Freud & Breuer, 1893a; Freud, 1894a; Freud, 1895b; Freud & Breuer, 1895d). In addition, important statements were made by Freud in unpublished letters and drafts (Freud, 1887–1904).

In 1895, harking back to the teachings of Ernst Brücke, Theodor Meynert and Brücke's assistant Sigmund Exner, Freud composed his "project of psychology," a collection of drafts included in his letters to Wilhelm Fliess (Freud, 1887–1904) and published posthumously in 1950. In the *Project* Freud returned to the brain, thus making a temporary detour from mind to brain, an historical example of recurrent problems in mind–body philosophies.

Ever since the ancient Greek philosophers pondered the relation between body and behavior, specifically, between brain and mind, two competing conceptions have crystallized: (1) the materialist, physiological, or determinist idea that matter, or brain, is the cause of mind; and (2) the personalist, psychological, or voluntarist idea that it is the person—or something central in the person called the soul, self, or ego—that is the cause, or author, of mind, i.e., thought, emotion, and intelligent action; the person is also called the *individual*, literally, one that is not further divisible, the integrated whole that is larger than the sum of its parts, also implying the wholeness of the person's consciousness of herself or himself, of his or her body, and of the world. I would like to call the latter the centrist conception of person and contrast it with a peripherist emphasis on the sense organs, the body's surface and its organs, the source of stimuli both exogenous and endogenous impinging on consciousness. Materialistic philosophies tended to favor peripherist models of a decentered person (i.e., a being reduced to or caused by its elementary psychophysical states). Centrist and peripherism are two competing views than run through Freud's entire *Project*.

Traditionally, medicine has been predominantly body- and brain-oriented, alongside such representatives of philosophical atomism as Democritus in ancient Greece and Hippolyte Taine in nineteenth-century France. Mind philosophers like Aristotle and Kant were more interested in the person and his abilities, with Herbart falling somewhere in between. It was not until the second part of the nineteenth century, owing to advances in neuroanatomy, neurophysiology, chemistry, physics, and mathematics, and the spread of the teaching of evolution during that period, that traditional brain/behavior debates acquired new momentum, so that old problems were rephrased in new scientific language. The old theological belief in the immortal soul, or mankind's pride in its higher intellectual and spiritual capacities, both housed in the cerebrum of *Homo erectus*, were now relegated to the dustbin of discarded doctrines by the triumphant first brain-based biological revolution in psychiatry one hundred years ago. In a climate where basic sciences were becoming increasingly quantitative, a strong tendency arose to decenter and depersonalize the person, to give causal priority to lower over the higher structures and functions, to reduce intelligence to the motion of molecules, the individual to impressions and impulses, the brain itself to a highly developed reflex mechanism. These ideas were also used to redefine mental health and disease. Similar claims are being made today by the current second biological revolution of the neurosciences that is growing on the ruins of dynamic psychiatry and psychoanalysis.

As already indicated, in the *Project* Freud embraced both centrist, personalist, and voluntarist philosophies and peripherist (i.e., determinist) scientific conceptions. But what was Freud's enduring identity? Contrary to efforts of Strachey and others to portray him as a heroic materialistic scientist, on his own showing, Freud was fundamen-

tally a philosopher of mind, a person-oriented methodologist of mind. In spite of his medical education and his early career as a neuropathologist, his true love remained philosophy and it shaped psychoanalysis as a method of therapy and research: a unique empirical personalist psychoanalytic psychology, like none before it and none since. However, some of the materialism Freud acquired in his scientific days left an imprint on the *Project* and also endures in some of his later speculations about mind.

Thus, he never abandoned entirely the determinist causes of behavior, as in his sexual instinctual drive theories in health and disease, which he cherished as his most important scientific contribution. He started his sexual theories in the period discussed here and would finalize them in his 1905 *Three Essays on the Theory of Sexuality*. Note Freud's emphasis on theory, not just three essays on sexuality but on the *theory* of sexuality, that is, the sexual theory of the neuroses, or the libido theory. This emphasis also marks the difference between theory and method.

In psychology method is what method does: it can be operationalized and it is close to ordinary experience, while theory is further away in the realm of speculation, abstraction, and generalization. Thus method can be observed and used, while theory can be confirmed or disconfirmed. When a given theory is overgeneralized, it becomes a fetish, a shibboleth, an *ism*, as in Freudism. Thus, any *pan* (Greek for *all*) ideology is apt to end in reductionism, as, for example, in pansexualism, the idea that everything is either sexual in nature or caused by sex, a charge against which Freud would defend himself over the years. Freud himself joked that his theories were a kind of mythology, like the theories of modern physics.

Let us be clear on the difference between method and mythology. Sexuality is not a myth, it exists and its manifestations can be observed. Similarly, conflicts about sexuality are real in a given situation and do cause psychological symptoms such as anxiety and depression, and their elucidation is therapeutic—this much is within the method. But a theory of sexuality elevated to a universal explanatory principle, conceived as a universal cause, as a *panchreston*—a thing for all things—as a key to all the neuroses, is sex mythology. Mythology here means creating a story, or as Freud would say to Fliess, a fairy tale, to represent an object, an agent, or model of causality, for example, representing the sexual instinct as the god Eros, an embodiment of a force that causes persons to become sexually attracted to each other. The need to create myths satisfies a basic human need, from early childhood on, to answer questions of causation and origins: who created the world, who created God, who created me? Of course, such questions can only be tackled by philosophy and theology, never by science. By extension, myth in common usage is a designation of something that is a fiction, a wished-for ideal, not a fact, as race or class equality in the United States is a myth.

Something similar can be said of the brain. In normal conditions, the brain exists and an intact brain is a precondition for an intact mind, whereas in pathological conditions brain lesions cause neurological and psychological defects and disorders. Beyond that the brain's physiological functioning is silent, that is, we are not conscious of its functioning as such, and the brain–mind juncture is still a sealed mystery, or, as expressed by the nineteenth-century pioneer of brain physiology, du Bois-Reymond, one of the members of the Helmholtz School, the brain–mind juncture is not only a *semper ignoramus*, a we-do-not-know, but a *semper ignorabimus*, a we-shall-never-know, unless the world as we know will change in some radical way, unless some of the utopias described by neuroscientists will one day become a reality. Until then, speaking methodologically and operationally, and taking account of the hierarchical organization of ordinary integrated human behavior, the normal mind needs its brain but is not reducible to it. Thus, any attempt to reduce psychology to brain physiology will forever remain a brain mythology.

The central brain myth is that brain is the cause of behavior, rather than its being

one link in the chain of behavior, the brain being a necessary organ in which mind lives but not sufficient to explain mind. When we think, feel, or act, we are no more aware of the brain than we are aware of our retinas when seeing or our ears when hearing: the organs do their work silently and unconsciously. Furthermore, when we think and feel and act, many more organs are involved in the psycho-physio-biological chain: the other nerves of the body, the neurohumoral and chemical transmitters, the muscles, the blood.

The myth of the brain as a cause of mind is coeval with mankind's eternal quest of the seat of the soul, and the history of this quest of localization is at least two millennia old (Revesz, 1917). Brain mythology and brain psychiatry were enthroned in the middle of the nineteenth century on the ruins of the former psychological psychiatry, when psychiatric eminence Wilhelm Griesinger, admired by Freud, made the pronouncement that "mental diseases are brain diseases," an idea that is coming back with a vengeance in our time. Similar ideas were also upheld by two eminent practitioners of brain anatomic-psychiatry: Freud's teacher in Vienna, Theodor Meynert, and his competitor in Leipzig, Paul Flechsig, none other than Judge Schreber's own psychiatrist (Lothane, 1992): they all described psychological and psychopathological phenomena as caused by real or hypothetical brain structures. Freud broke with this tradition in his work on aphasia (1891b), considered by some to be his first psychoanalytically inspired text, as reflected in one of the epigraphs to this paper, espousing a holistic (i.e., functionalist, or personalist) approach even in the face of obvious structural brain damage. The road lay open to the psychological conceptualization of the neuroses.

EVOLUTION OF FREUD'S DYNAMIC AND PERSONALIST CONCEPTIONS OF NEUROSIS

In 1886 Freud started a private practice of medicine, largely seeing patients with nervous, or functional, complaints, and he treated these with hypnotic suggestion and psychotherapy, reporting on one success story six years later, his first published case (Freud, 1892–1893). The orientation in that paper was personalist, methodological, and psychological.

In 1893 Breuer and Freud published their revolutionary Preliminary Communication in the prestigious *Neurologisches Zentralblatt*, the premier forum for neuropathologists. In the spring of 1895 Breuer and Freud came out with their groundbreaking *Studies on Hysteria*, in some respects a return to the forgotten legacy of the early nineteenth-century humanistic psychiatry that taught that symptoms are psychological in nature and have meaning, but that in other respects represented a new departure. In the chapter on the treatment of hysteria, Freud had this to say about his method: "[I]n the study of hysteria a detailed description of mental processes such as we are accustomed to find in the writings of imaginative writers enables me, with the uses of a few psychological formulas, to obtain at least some insight into the course of that affection" (Breuer & Freud, 1895d, pp. 160–161). The scientist and humanist within Freud are the two perennially unreconciled identities.

In the *Studies* Freud does not discuss the brain at all, while Breuer expresses their joint position as follows:

In what follows little mention will be made of the brain and none whatever of molecules. Psychical processes will be dealt with in the language of psychology; and indeed, it cannot possibly be otherwise. . . . For while ideas are constant objects of our experience and are familiar to us in all their shades of meaning, "cortical excitations" are on the contrary rather in the nature of a postulate, objects which we

hope to be able to identify in the future. The substitution of one term for another would seem to be no more than a pointless disguise. (Breuer, in Freud & Breuer, 1895d, p. 185)

Breuer's method to speak psychologically about psychological experiences is still operationally valid. However, his dream of finding objects in the shape of cortical excitations has been realized only to the extent that, thanks to new sophisticated technology (like positron emission tomography), we can now visualize and record various metabolic brain events. But we still have no machinery that can record mental events: those still must be verbalized by a conscious person to another conscious person.

It is easy to understand ideas as psychological; it is more confusing to accept "ideogenic affects" (Breuer, 1895d:201). Thus, at first Breuer disagrees with Paul Möbius, a noted Leipzig neurologist, psychotherapist, and author, who held that all hysterical symptoms are ideogenic, that is, psychological in content and caused by ideas. A similar ideogenic conception of traumatic hysteria had been earlier propounded by Charcot. We see Breuer baffled by somatic hysterical symptoms, like red skin blotches and pain, for these are caused not just by ideas but also by "the abnormal excitability of the nervous system" (Breuer, 1895d, p. 191), thus seeming to contain an irreducible physiological component. Even more tellingly, Breuer believes, as most psychiatrists still do today, that vivid visual hallucinations owe their supposedly objective character to excitation of the sensory areas of the cortex and the "perceptual organ" (1895d, p. 191), when in reality all hallucinations belong in the realm of dreams and images and have nothing to do with sensory organs or perception (Lothane, 1982). The reality of cerebral processes and excitations aside, what Breuer cannot grasp is that so-called hysterical symptoms, be they of the nature of ideas, sensations, functional somatic signs, or vivid images, whatever their physiological correlates and concomitants, are still to be regarded as psychological and psychogenic modes of self-expression and communications to an audience (Lothane, 1995, 1997a). Freud is heir to similar confusions and equivocations.

It is because of this inability to leave behind the brain and the physiological apparatuses that Breuer continues to be concerned with "intracerebral tonic excitations," a concept fashioned by his colleague Exner, a teacher of Freud, which sends him speculating about neural conduction, the energy in quiescent and excited nerves fibers, combined with the idea that "there exists in the organism a '*tendency to keep intracerebral excitation constant*' (Freud)" (Breuer, 1895d, p. 197; emphasis in the original). In the end Breuer manages to overcome his "physiologism." Thus he is clear on the reality of physiogenic affects, such as the sexual excitement of puberty, "this endogenous heightening of excitation, determined by the action of the sex glands . . . firmly linked (in the normal course of things) with the perception or an idea of the other sex . . . [and] with the remarkable phenomenon of falling in love" (1895d, p. 200). "No attempt will be made here," declares Breuer, "to formulate either a psychology or a physiology of the affects," except for what is "of importance for pathology and moreover only for ideogenic affects—those that are called up by perceptions or ideas" (1895d, p. 201). Here the salient point is that "all the disturbances of mental equilibrium which we call acute affects go along with an increase of excitation . . . and level out the increased excitation by *motor* discharge" (Breuer, 1895d, p. 201; emphasis in the original). Such a leveling out, or abreaction, of strangulated affects was the centerpiece of the cathartic therapy of neurotic symptoms first introduced by Breuer.

What emerges from the foregoing analysis is that it is somehow natural to correlate the excitations that go with strong emotions (i.e., agitations and commotions) with quantities of brain energies and brain excitations. But of course, when it comes to emotions, there is no need to speak of the *parts* of a person, like the brain, rather than

the whole person. Freud did just that in the *Studies on Hysteria* and in the first paper on the neuropsychoses of defense, “an attempt at a psychological theory of acquired hysteria, of many phobias and obsessions and of certain hallucinatory psychoses” (Freud, 1894a).

The strangled emotions Breuer and Freud discussed in their Preliminary Communication were mainly the commotions of conflict resulting from rage. But the most frequent feelings, emotions and moods Freud saw in his patients were fear and anxiety, and those he connected to the unpleasure resulting from conflict and frustration in one’s sexual life. (Until his essay on mourning and melancholia of 1917, Freud postponed discussion of that other most important source of mood disorder, depression resulting from loss and repressed anger.) In his paper of 1894 Freud offers his twofold working hypothesis of the defense neuroses: (a) “to resolve the contradiction between [an] incompatible idea [in particular, a sexual one] and [the] ego by means of thought activity” (1894a:47), chiefly by means of repression; and (b) “turning [a] powerful idea into a weak one in robbing it of the affect—the sum of excitation—with which it is loaded . . . [so that] the sum of excitation which has been detached from it must be put to another use” (1894a, pp. 48–49). He described “three mechanisms” of such a detachment of sums of excitation: “[1] transformation of affect (conversion hysteria), [2] displacement of affect (obsessions) and (3) exchange of affect (anxiety neurosis and melancholia)” (Freud, 1887–1904, letter of May 21, 1894, *S.E.* 1, p. 188). He was able to formulate his energy hypothesis without any recourse to topographical localization in brain structures or nerve cells. This Freud will attempt to do in another work, the posthumous *Project*.

FREUD’S PROJECT OF PSYCHOLOGY

It was in the fall of 1895, as if continuing the ideas of Breuer and Exner, that Freud composed a draft he himself alluded to as “Project of Psychology” (*Entwurf der Psychologie*) and characterized it as “a psychology for neurologists,” which in his day meant not only physicians practicing neurology but neuroscientists as well. The first to name it *A Project of a Psychology* (*Entwurf einer Psychologie*), changing Freud’s definite article to an indefinite one, were the editors and publisher of the draft in 1950 (Freud, 1950a); the second to change Freud’s name was James Strachey, the chief translator of the *Standard Edition of the Complete Psychological Works of Sigmund Freud* (henceforth abbreviated as *S.E.*), who gave it the title of *Project for a Scientific Psychology* (Freud, 1950). Strachey’s renaming harbors a hidden bias: to promote Freud the scientist over Freud the philosopher, to represent Freud’s materialistic discourse about mind as more valid than Freud’s psychological discourse about mind. This trend has been revived nowadays in some quarters. But the scientific yield of the *Project* is more an ambition of Strachey’s than an achievement of Freud’s.

Freud planned the draft in three parts.

[A] The first part of this project contain[s] what could be deduced from the basic hypotheses, more or less *a priori*, molded and corrected in accordance with various factual experiences. [B] [The] second part seeks to infer from the analysis of pathological processes some further determinants of the system founded on the basic hypotheses; [C] a third part will hope to construct from the two preceding ones the characteristics of the normal passage of psychic events. (Freud, 1950, p. 347)

Why did Freud regress from mind to brain and what motive did he have in doing so? I believe I found the answer in the unexpurgated letters of Freud to Wilhelm Fliess, the

Berlin ear, nose and throat specialist and surgeon and author of books on speculative biology. With this synthesis of neurology and psychology Freud, I submit, wanted to make his new psychology palatable to Fliess, sometime critic and proxy analyst, who by dint of his medical background was philosophically committed to a materialistic conception of psychology.

At this time in his life Freud has completed the *Studies* and is detaching his emotions from his former medical friend, Breuer, 14 years his senior (Jones, 1953, p. 255), and attaching them to his new dearest friend Wilhelm, two years his junior, who is not committed to psychotherapy and is therefore apt to be more skeptical and critical of Freud's dynamic ideas than was Breuer. While Fliess's letters to Freud did not survive, certain statements in Freud's letters suggest that Fliess could hit hard, as when Freud says in reply: "With an unerring hand you have raised the question at the point which I feel is the weak one" (Freud, 1887–1904, *S.E.* 1, p. 189). Freud was clearly eager to please Fliess.

An ingratiating attitude toward Fliess is suggested by Freud's praising Fliess for pointing him in the direction of Hippolyte Taine's famous book of 1870, *L'Intelligence* (Freud, 1950a, p. 168), a work inspired by a theory of mind that was atomistic, mechanistically determinist, and opposed to any idea of introspection or such notions as *person* or *self* (regarded as nothing but a series of mental events), and such functions as memory or judgment, in short, a psychology that could not have been more drastically different from that of philosophers like Brentano or Kant, both models for Freud, and against Freud's own dynamic way of thinking.

A month after writing the concluding chapter of the *Studies on Hysteria*, according to Sulloway (1979, p. 113–114), Freud writes to Fliess: "I am so deep in the 'Psychology for Neurologists' that it quite consumes me, until I have to break off out of sheer exhaustion. I have never been so intensely preoccupied by anything. And will anything come of it? I hope so, but the going is hard and slow." Who were the other neurologists Freud was addressing?

In May Freud explains his goal to Fliess as follows:

"My tyrant is psychology; it has always been my distant, beckoning goal, and now, since I have hit on the neuroses, . . . I am plagued with two ambitions: to see how the theory of mental functioning takes shape if quantitative considerations, a sort of economics of nerve-force, are introduced into it; and secondly, to extract from psychopathology what may be of benefit to normal psychology." (Sulloway, 1979, p. 114)

The first ambition is quite new; and the second ambition was shaped by Freud's having been a student of hysteria and hypnosis as taught by Charcot, Bernheim, and many others.

In early September Freud went to Berlin to seek Fliess's advice on a number of problems in the *Project* and his encouragement to proceed. In mid September of 1895, busy writing, Freud still deprecates his *Project* for a scientific psychology as a provisional "scribble" (Freud, 1887–1904, letter 73; henceforth, letters indicated by number only are from the complete original German edition; the translations are mine) upon which he conveyed thanks to his friend for his strong encouragement to "treat the matter seriously" (letter 74). After a while he despairs over the effort to combine his "theoretical fantasy" with the "psychopathology of repression": "I had to rework a number of drafts and alternated between pride and happiness and shame and misery, and at the end of enormous mental torture I tell myself with apathy: it does not work, maybe it will never come together. . . . The mechanistic explanation is not successful" (letter 75). In response to Fliess's "punishing lines" he still ventures to send him "a few more pages of my philosophical stammer" (letter 77). A month later, after an encouraging letter from Fliess, he is elated: "the thing took off like a machine and from here

on will continue on its own," listing a string of ideas whose validity he regards as proven (letter 78). But in early November the *Project* is put away in a drawer and by the end of the month Freud writes: "I can no longer understand the state of mind in which I hatched the [project of] psychology and cannot fathom how I could have burdened you with it. I believe you have been too courteous, I now see it as a kind of absurdity" (letter 82).

Freud's remark in a part of the first letter to Fliess of 1896, suppressed by Strachey (Freud, 1950, p. 388) but not by Kris (Freud, 1950a, p. 152), tells it all: "I can see how you, bypassing being a physician, reach your erstwhile ideal of understanding man as a physiologist; and how I nourish a most secret hope to go the same way in order to reach my original goal, philosophy" (letter 85). This is what I have set out to prove. In that letter the hapless draft is mentioned for the last time. Was Freud's self-deprecation justified? To answer this question let us survey the tripartite yield of the *Project*.

A: PART I—GENERAL SCHEME (THE BASIC HYPOTHESES)

In the opening paragraph of Part I of the *Project* Freud states his intention:

... to furnish a psychology that shall be a natural science; that is, to represent psychological processes as quantitatively determinate states of specifiable material particles, thus making the processes perspicuous [palpable, anschaulich, Z. L.] and free from contradiction. Two principal ideas are involved: (1) What distinguishes activity from rest is to be regarded as a quantity Q subject to the general laws of motion. (2) The neurones are to be taken as the material particles. (Freud, 1950, *S.E.* 1, p. 295; 1950a, pp. 379–380)

The problems with this enterprise become immediately perspicuous, and it is not free from internal contradictions. To begin with, if natural science means, on Freud's own showing, not only matter and quantity, but also, as implied, measurement, then in the entire *Project* there is no mention of any experiments to quantify the energy denoted by the letter Q, and both the nature of this energy and its quantities remain purely speculative. Thus, neurons do contain material particles, however those may be defined, but are not themselves particles of any kind, but highly organized cells for specific physiological processes, and the energy in neuronal transmission is either electrical or chemical, facts that had already been described by Ernst Brücke in 1876, Émil du Bois-Reymond in 1877, and Ewald Hering in 1878, but there is no mention of them here (Amacher, 1965; Boring, 1942; Brooks & Cranefield, 1959; Herrnstein & Boring, 1965; Wellcome Foundation, 1958). The notion of general laws of motion may hold good for the physics of Galileo and Newton, but is insufficient to explain the electrical and chemical events in neurons and synapses, as we have come to know them since (Kandel, Schwartz & Jessell, 1991; Eccles, 1994).

Moreover, the program as outlined contradicts the psychological principle of dispensing with brain discourse enunciated by Breuer in the aforementioned passage from the *Studies*. Besides, is not a psychology that deals with ideas and emotions just as much a "natural science" as an artificial psychology of fictitious quantities and particles? Does Freud mean to say that the ideas, images, and emotions described and explained in the *Studies* and in the *Interpretation of Dreams* are not natural phenomena? But this is to confuse the quantitative with the empirical. For the findings of laboratory psychology and of Freud's own psychoanalytic psychology are certainly empirical and amenable to empirical validation, and as such qualify to be considered scientific. We also consider empirical findings in the social sciences, even though they are not quantitative sciences in the same way as physics and chemistry or descriptive sciences as geology or zoology.

Immediately after the aforementioned opener, the “*First Principal Theorem: The Quantitative Conception*,” avers Freud

is derived from *pathological clinical observation* especially where *excessively intense ideas* were concerned—in hysteria and obsessions, in which . . . the quantitative characteristic emerges more plainly than in the normal. Processes such as stimulus, substitution, conversion and discharge, . . . directly suggested the conception of *neuronal excitation as a quantity in a state of flow* . . . It seemed legitimate to attempt to generalize what was recognized there. Starting from this consideration, it was possible to lay down a basic principle of neuronal activity in relation to Q, which promised to be highly enlightening, since it appeared to comprise the entire function. This is the *principle of neuronal inertia*: that neurons tend to divest themselves of Q. (Freud, 1950, pp. 295–296; emphasis added)

But transforming gross quantitative characteristics of pathological excitement, a commonsense observation, into neuronal excitations, or psychopathology into putative physiology, is nothing more than another method of brain mythology: anthropomorphizing and psychologizing brain structures or functions by inserting into them “psychological processes constructed by psychologists to explain psychological phenomena” (Anderson, 1962, p. 11). What is the advantage in this new neuronal discourse as compared with the quantitative characterizations in the aforementioned essay on neuropsychoses of defense?

Four issues are raised in this passage: (1) the neural basis of strong feelings and emotions in health and disease; (2) neuronal excitation equated with a hypothetical quantity of energy in a state of flow; (3) the issue of neuronal inertia; and (4) the dual, neuronal and psychical, phenomenology of stimulus, substitution, conversion, and discharge. Let us survey these briefly.

(1) We have seen Breuer translate psychopathological heightened emotionality, here “excessively intense ideas,” into neurological terms, in the end admitting the existence of ideogenic affect, without ever hypothesizing “a quantity Q.” Neither did Breuer attempt any localization of function in the brain.

(2) Freud wants to generalize Q as the universal property of neurons, but such a quantity, even though it feels intuitively right—there are metabolic processes in the cells—has not been demonstrated by any precise physiological method, nor the assumed tendency of neurons to divest themselves of such Q. While it is true that the nervous system functions to rid the organism of painful stimulation, this does not entail the neurons, like pipes, filling up with or being emptied of a fluid-like energy Q flowing in them: Such a hydraulic hypothesis is supported neither by the histological structure of nerve cells and fibers, nor by their electrical or chemical functioning as resting, action, or injury potentials, nor by the events in the synapse, nor by the transducing processes in sensory receptors. The analogy of filling up and emptying seems, however, to fit the main premise and inference in Breuer’s and Freud’s description of emotive processes in neurosis and metaphorically to depict the cathartic abreaction of strangled affect accompanying the remembering of traumatic situations. Strangled affect easily suggests something pent-up and pressing for discharge.

Before the *Project* the energy metaphor was better employed by Freud in Draft E (Freud, 1887–1904, *S.E.* 1, pp. 189–195) and in a subsequent paper (1895b), in which he described a group of functional nervous disorders classed as actual, or present-day neuroses, chiefly neurasthenia, hypochondria, and the newly delineated anxiety neurosis, to be differentiated from psychoneuroses (that is, disorders that stemmed from infantile traumatic disturbances of sexuality). The anxiety neurosis was defined as a purely physical disorder, and its “nuclear symptom” as “*a quantum of anxiety in a freely floating state*” (1895b, p. 93; emphasis Freud’s) due to “accumulated somatic ex-

citation of a sexual nature" (1895b, p. 107), and caused by current sexual frustrations or inhibitions, not by past problems. Using the male as a model, but applicable to the female as well, Freud described this state as follows: In the sexually mature male organism somatic sexual excitation

. . . [is] manifested as the pressure on the walls of the seminal vesicles, which are lined with nerve endings; . . . it will have to reach a certain height before . . . [its] conduction to the cerebral cortex and express itself as a psychical stimulus. When this has happened, however, the group of sexual ideas which is present in the psyche becomes supplied with energy, and there comes into being the psychical state of libidinal tension which brings with it an urge to remove that tension. A psychical unloading of this kind is only possible by means of what I shall call the *specific* or *adequate* action, . . . [i.e.] a complicated spinal reflex act which brings about the unloading of the nerve-endings, and in all the psychical preparations which have to be made in order to set off that reflex. (Freud, 1895b, p. 108; emphasis Freud's)

It emerges, however, that anxiety neurosis is only physical with respect to its causation, a case of unsatisfied sexual hunger and its physical sequelae (free-floating anxiety with somatization), but it has psychic consequences: a state of unpleasant tension. There is nothing jarring in the picture of a quantum of energy freely floating from one system to another, causing a variety of functional disorders and psychological distress, nor in the idea of unloading of all that accumulated libido, whatever its physicochemical nature, leading to postorgasmic quietus. The state of being loaded is also called by Freud *besetzt*, better known by the Greek neologism invented by Strachey, *cathected*, from cathexis, meaning " 'occupation' or 'filling' " (Strachey's footnote, *S.E.* 3, p. 63), a term with which, on Strachey's own showing, Freud was initially unhappy; but he could not resist the metaphor of filling up and emptying.

The hydraulic metaphor will come in for yet another use in connection with another hypothetical sort of energy, the energy of the sexual drives, or libido, the central focus of *Three Essays on the Theory of Sexuality*. Here, too, one can see how the actual ejaculation of sexual products in the male orgasm readily fits the image contained in the metaphor of filling up and discharging accumulated "quantities" of libido. The metaphor also seems to hold good for representing the idea of the tension-de-tension model of drives, the accumulation of sexual tension and its release in the orgasm reflex, in both the male and the female, even though there is no emptying of sexual "products" in the latter.

(3) The hypothesis of neuronal inertia, elevated by Strachey to a mechanistic universal principle he called "principle of constancy," foreshadows Freud's late-life musings on the death instinct and the principle of Nirvana. In the meantime the inertia theory presents some contradictions. Freud depicts Q as flowing into the nervous system from exogenous (that is, perceptual) and endogenous sources. The latter "have their origin in the cells of the body and give rise to the major needs: hunger, respiration, sexuality" (Freud, 1950, p. 297). But in the same breath Freud becomes aware of an insoluble contradiction:

From these the organism cannot withdraw as it does from external stimuli . . . They only cease subject to particular conditions, which must be realized in the external world, . . . [i.e., by means of] an action (which deserves to be called "specific") . . . In consequence, the nervous system is obliged to abandon its original trend to inertia . . . (Freud, *S.E.* 1, p. 297)

So much for grand generalizations.

The inertia theory is breathtakingly grand, but is metaphysical, not clinical, nonetheless, as his conception of the neuronal systems announced in the above quoted opening paragraph of the *Project*, to be discussed presently.

(4) No less speculative than the putative physiology of Q is Freud's neuroanatomy, or the systems of neurons Freud designated by the Greek letters phi, psi, and omega, or as he collectively called them, the system "PhiPsiOmega," where psi roughly refer to psyche, or processes of thought and retention of thought, while phi and omega refer to transient processes of sensation and perception. The psi cells were thought to be impermeable and the others permeable to passage of energy. Freud is at pains to admit all this is "conjecture," that

we should not have *invented* the two [classes], phi and psi, we should have *found* them already in existence. It still remains to identify them with something known to us. In fact we know from anatomy a system of neurones (the grey matter of the spinal cord) which is alone in contact with the external world, and a superimposed system (the grey matter of the brain) which has no peripheral connections but to which the development of the nervous system and the psychical functions are attached. . . . Here is a first possibility of testing our theory upon factual material (Freud, 1950, p. 303).

Are these neuronal systems discovery or invention? The last statement is also imprecise: the gray matter of the brain *is* connected to the outside world through the synaptic relays from the periphery to the center. The rest is pious talk, for there is no testing here but only theorizing: Freud's neuronal theories—a psychology for neurologists.

Freud's physiological psychology comes in two varieties: (a) one grounded in the traditional neurophysiology of the day and (b) his own speculative system elaborated only in the *Project*. Freud invokes neural structures (nerve-cells, axis-cylinders, contact-barriers) and physiological processes (stimuli exogenous and endogenous, currents, discharges, and facilitating pathways, or *Bahnen*) to explain psychological activity, all these well within the pale of the neuroscience of the day, to which Freud had made his own respectable contributions (Freud, 1886b, 1888, 1891b). It should also be realized that prior to the *Project*, sensory physiology and cognitive psychology had already been established fields, the former as a branch of neurophysiology, the latter as experimental psychology. In line with conventional wisdom (for example, that imparted by his teacher Meynert), Freud sees sensation, perception, memory, and the acquisition of experience and knowledge as mediated by the reflex arc that connects the external world with the cerebral cortex:

When different sensory cortical elements are excited from their respective peripheral sense organs, . . . excitation-conducting paths [*Bahnen*] are developed between these cortical elements, so that subsequently the excitation of one of these cortical elements is connected with the excitation of the other. . . . The sphere of experiences appropriate to [the associative perception of an object]—the idea of the needs satisfied through the object and the movements which would bring about their satisfaction—also appear in consciousness. A fundamental part of the material substrate of memory and for the expedient employment of an object consists of *Bahnen* which are formed through experience within the same and between different cortical areas, and which are called association fibers because they serve the association of ideas (Freud, 1888, p. 692, quoted in Amacher, 1965, p. 59)

However, Freud's descriptions of the phi-psi-omega neurons bear little resemblance to the known neurophysiological models of his day or since (Exner, 1894; Kandel, Schwartz & Jessell, 1991). Freud freely mixes fictitious neural systems and psychological processes to fulfill the promise of a psychology as a natural science, but he ends in a mechanistic construction that detracts from his dynamic ideas. No wonder that during his lifetime Freud chose to keep the manuscript in a drawer.

As one example, consider Freud's way with the problem of memory. While, since

Freud's time, neuroscientists have gained considerable understanding of the neural basis of visual and auditory perception, the neural basis of memory is still in its beginnings. Here is what Freud proposes: "A *psychological* theory deserving any consideration must furnish an explanation of memory" (Freud, 1950, p. 299; emphasis added). But what he offers is a physiological hypothesis to account for (1) "perceptual cells," which act as receptors of successive ways of stimulations and have to be wiped clean of impressions to receive new stimuli and (2) "memory cells," which can remain permanently altered since their job is to store memories. Accordingly, his new theory requires that perception should be mediated by permeable phi neurons that allow for quick passage of intracellular energy quanta (Q eta), while memory is mediated by impermeable psi neurons, "loaded with resistance and holding back Q eta," being "vehicles of memory and so probably of psychical processes in general" (*S.E.* 1, p. 300). That such processes of perception and memory exist is common knowledge, but *how* the brain does it is still a mystery. And yet no less a mystery is why Freud felt so compelled to create *physiological hypotheses* to explain these processes.

Freud does not hide his own uneasiness about the highly speculative status of phi and psi: "Anyone . . . who is engaged scientifically in the construction of hypotheses will only begin to take them seriously if they can be fitted into our knowledge from more than one direction and if the arbitrariness of a construction *ad hoc* can be mitigated in relation to them. . . . At all events, morphologically (that is histologically) nothing is known in support of the distinction [of phi and psi]" (*S.E.* 1, p. 302). If all this is true, "we should not have *invented* the two phi and psi, we should have *found* them already in existence." Voltaire said the same about God: We are still looking. As to "the problem of quantity," Freud's own conclusion is: "here there is a lack of evidence" (*S.E.* 1, p. 305), with which I cannot disagree.

Even greater problems are encountered when considering "the problem of quality" and the problem of consciousness. Freud acutely states the core problem as follows: "every psychological theory . . . from the point of view of natural science must fulfill yet another requirement. It should explain what we are aware of, in the most puzzling fashion, through our "consciousness," since this consciousness knows nothing of what we have so far been assuming—quantities and neurones" (*S.E.* 1, pp. 307–308). This is indeed solid fact—we are not conscious of our brain as such, only of our mind in action—and therefore the brain–mind juncture is the mother of all questions that has vexed philosophers down the ages and to which neuroscience has yet found no answer. For after all is said about energies stimulating receptors, transduction and conduction of action potentials, first and second messenger cascades, ion channels, and encoding and decoding of stimuli in the nervous system, the neuroscientist ends by speaking in the language of psychology and philosophy and tells us that visual perception is not "a simple process of assembling elementary sensations in an additive way, component by component, [as represented] by . . . John Locke and George Berkeley, . . . not atomistic but holistic [and] is an active and creative process [as represented by] the school of *Gestalt psychology*" (Kandel, Schwartz & Jessell, 1991, p. 441; emphasis in the original). Indeed, Gestalt psychology vindicated Emmanuel Kant, who argued against the two above named British precursors and a third, David Hume, that such creativeness for the mind, a sum much greater than its parts, is based on the mind's ability, for instance, to innately, or *a priori*, to perceive space and time. At the time of the *Project* Freud could not have known what the Gestaltists would be saying around 1910, but he knew Kant.

"Where do qualities originate?" asks Freud, and he answers: "Not in the external world. For out there, according to the view of our natural science, to which psychology must be subjected here, there are only masses in motion and nothing else" (*S.E.* 1, p. 308). Masses in motion along with the denial of the existence of qualities is an ab-

stract idea formulated by Galileo in the seventeenth century, valid as proof of his physics, but contradicted by commonsense experience: The world out there *is* full of colors, scents, sounds, and tastes, and it matters little whether we become aware of it, thanks to the special fit of energies and receptors or what mind adds to matter: the experience of qualities is real, the obfuscations of philosophers notwithstanding.

In answering his question about qualities, Freud is tripped up by his own theorizing: “Where do qualities originate? . . . In the phi system perhaps?” But that is doubtful. “In the psi system then,” but the latter, dealing with “reproducing and remembering, and this, speaking generally, is without quality. Remembering brings about *de norma* [normally] nothing that has the peculiar quality of perceptual quality” (*S.E.* 1, pp. 308–309). The last statement is erroneous: As a distinct function, memory is not perception, but it can most certainly span the range from remembrances pallid to most vivid; quite often it can retain and revive all the aliveness of past perception, or as Freud would later say, establish an identity of perception and sometimes with the “ultra-clarity” of hallucinations (Freud, *S.E.* 23, p. 266). Freud’s way out of the dilemma is to invent another fictitious entity, a “third system of neurones” (*S.E.* 1, p. 309), the omega or perceptual neurons, the lower case omega, as Freud bemusedly explains, having the same shape as the lower case German letter *w* for *Wahrnehmung*, perception. These perceptual neurons of the third kind are miraculously “excited along with perception, but not along with reproduction, and whose states of excitation give rise to various qualities—are, that is to say, *conscious sensations*” (*S.E.* 1, p. 309; emphasis Freud’s). How does he know about such neuronal separations of functions? How can anyone know?

But now a new contradiction arises:

The sense organs act not only as Q-screens, like all nerve-ending apparatuses, but also as sieves; for they allow the stimulus through from only certain processes . . . and it is these modifications which proceed through phi via psi to omega, and there, where they are almost devoid of quantity, generate conscious sensations of qualities. This transmission of quality is not durable; it leaves no traces behind and cannot be reproduced (*S.E.* 1, p. 310)

The *sieve* is a good metaphor for sensory receptors, but then we are left with this curious conundrum: Omega neurons, operating without quantity, give us a conscious sensation of quality that cannot be reproduced, which is belied by the fact that we can remember scents, tastes and colors; while the other systems, Phi and Psi, operate with quantities, but do not produce conscious sensations. This just does not add up. Freud demolishes his own theory in these words: “No attempt, or course, can be made to explain how it is that excitatory processes in the Omega neurones bring consciousness along with them” (*S.E.* 1, p. 311): That much is granted, for all mechanistic theories of consciousness leave us in the lurch. Indeed, we are presented with a pleonastic paradigm of the personalized particle and the depersonalized person, with a plethora of systems, symbols, and sketches (*S.E.* 1, pp. 314, 324).

Now the most common German synonym for *person* is the first-person pronoun *ich* or *I*, whereas in English the most common such synonym is *self*. In German *das Ich* is not the person, but the philosophical abstraction of the person’s individuality and is occasionally used as a synonym for person. This is clearly known to Freud the pragmatist. But when, in his “introduction of the ‘Ego’ ” (*S.E.* 1, p. 322), he dons the hat of the neuroscientist, *das Ich* naturally becomes “an organization formed in the psi . . . [and] defined as the totality of psi cathexes, at the given time, in which a permanent component is distinguished from a changing one” (*S.E.* 1, p. 323). However, the psi neurons are also joined by omega neurons (the role of phi neurons temporarily postponed), and other neurons symbolized by a, b, and c, and converted into smart particles capable of performing such complex functions as “indication of reality,” “indication of quality,”

distinguishing perception from memory, judging, or providing a sensation of identity. Clearly, in this plethora of parts, sight has been lost of the *person*, the “*fellow human-being*” (*S.E.* 1, p. 331, emphasis Freud’s), the one doing the perceiving, thinking and remembering, dreaming and hallucinating, wishing and willing, let alone attending and judging, the conductor of this orchestra of these all-knowing homunculi.

To sum up: Freud’s attempt to explain mind by brain, rather than sticking to his original project to explain mind by mind, has led him down a number of blind alleys. His speculative physiology of the nervous system could fairly be dubbed, borrowing a felicitous phrase from Eccles (1994), Freud’s grand neuronal fantasia: we can consign it to the museum of metabiology.

FREUD’S SOURCES OF INSPIRATION

In his scholarly analysis of Freud’s early neurological theories, and especially those in the *Project*, Amacher (1965) traced not only the march of certain ideas in the history of brain anatomy and brain mythology, but he also showed how much Freud’s neuronal theories owed to the Helmholtz school of neurophysiology. Freud was especially indebted to the founding father of that school, Ernst Brücke, who followed in the footsteps of the great German physiologist Johannes Müller; to Brücke’s assistant Sigmund Exner, whose *Entwurf*, or project for the physiological explanation of psychical phenomena (Exner, 1894) became an inspiration for Freud’s *Entwurf*; and to his other predecessors in brain anatomy, Meynert, Charcot, and Wernicke.

Some of Brücke’s theories were based on the notion of the spinal reflex arc, first formulated by Descartes: to wit, that excitation of the end-organs produces stimuli or impulses that are transferred via afferent nerves to brain centers and from there to efferent nerves and effector organs. These reflex theories were utilized by Freud in his descriptions of neural conduction, summation, facilitation, and inhibition. Since the brain centers are composed of gray matter, like the spinal and sympathetic ganglia of the spinal column, it was natural to view the brain as nothing but a more evolved or superior ganglion and to attribute to it the ability to perform such superordinate mental reflexes as perception and thought: *reflexes*, not acts of a perceiving or thinking person. This reflex-based psychology found a faithful ally in traditional associationism, according to which mind is nothing but a mechanical combination, or association, of ideas derived from sensations. Associationism dated back to British and French philosophers of the seventeenth and eighteenth centuries and culminated in Freud’s time in the psychologies of Mill and Taine. Such ideas were embraced by Freud’s other important teacher, Theodor Meynert, author of an influential textbook of psychiatry and by Freud’s “rival” in Leipzig, the renowned brain anatomist and sometime psychiatrist, Paul Flechsig.

In his neurophysiology Meynert followed Müller and Brücke and located mind in the cortex of the cerebral hemispheres, functioning as a mega-ganglion made up of two interconnected systems of cells and fibers: (1) projection systems, connecting sensory organs from the periphery to motor organs, and (2) association systems, connecting the various part of the brain and providing the neural basis of intelligence, where “association” suggested both connections between cells and combinations of associations (i.e., ideas). According to Meynert’s schema, inflowing sensory impulses were transmitted from the periphery along projection fibers to terminate in the receptive and thence to association fibers. These fibers in turn opened the various areas in the cortex to further interconnections in a process he called induction, or “the fundamental logical function,” thus to become the source of images of perception and memory and the basis of intelligence from childhood to adulthood. Among the elements in this ever-developing

plastic cortex were forces that Meynert called the *instincts*, such as the instinct for food as observed in the behavior of the sucking infant. Accordingly, such early childhood experiences as the infant sucking his fingers or the nipple, placed “between conscious and reflex movements” and providing pleasure and soothing pain, led to the development of a synthesis that Meynert called “the primary individuality,” interchangeably called the “primary ego” (*das Ich*) or the “nucleus of individuality” (Amacher, 1965, pp. 33–35), and from this the secondary adult ego evolved over time. We shall see how in Freud’s *Project* such ideas of Meynert were transformed into psychoanalytic concepts, both theoretical and methodological.

Exner’s descriptions of neurological counterparts to psychological phenomena are characterized by Amacher as being midway between those of Brücke and Meynert. Exner was much concerned with transmission of nervous impulses “from one periphery to another much as a fluid moves through a system of pipes” (Amacher, 1965, p. 45), while in other places he saw neural transmission from neuron to neuron as a summation of stimuli he called “intercellular tetanus”; Freud would later combine these ideas with his own notion of contact-barriers between neurons to fashion the notion of cathexis.

In other respects Exner adopted Meynert’s idea of induction and of the fundamental logical function occurring in the cortex to explain neurologically the phenomenon of association of ideas. However, he added the hypothesis of subcortical “emotion centers,” such as the “pain center,” also referred to as the “unpleasure center” (*Unlustzentrum*). Impulses in the pain center, taught Exner, became integrated with stimuli coming in from sensory receptors and with memory images laid down in the course of previous experiences. Exner was also interested in instincts, defined by him as the “association between an idea and an emotion center” (Amacher, 1965, pp. 51–52), among which he underscored the participation of ideas and stimuli in the sexual instincts, those determining sexual behavior. Here is an example of Exner’s ideas about the genesis of heterosexual and homosexual love:

In every normal young man the center for sexual instincts . . . [may show] an increased tonus. . . . The cortical excitation accompanying the sight [of a girl] causes the beginning of an intercellular tetanus between cortical processes and this center. . . . “The young man is in love.” . . . It also can occur . . . that an association becomes developed with another idea, for example, that of a man. (Amacher, 1965, p. 53)

We can agree with the assessment of Amacher that in the *Project* and beyond Freud is working over the ideas of Brücke, Meynert, and Exner: Neural excitation flowing in nerves as if in pipes, the result of which causes neurons to fill up with quantity, the divestment of which produces neuronal inertia. This inertia ensures the division of neurons into *motor* and *sensory*; and, in turn, leads to reflex motor movement, the purpose of which is to rid the organism of the excess of stimulation, converting unpleasure into pleasure.

A central idea Freud took over from Meynert was the “experience of satisfaction,” or the drive toward wish-fulfillment (Amacher, 1965), an idea Freud also found in the writings of the German psychiatrist, Griesinger. Freud would place this concept at the center of the dynamics of dreaming, as described in the fabled seventh chapter (Freud, 1900); of hallucinatory neuropsychosis of defense, also called Meynert’s *amentia* (Freud, 1894a); and of the conception of neurotic symptoms as a form of disguised sexual gratification. Meynert spoke of experiences of pleasure laying down new pathways in the cortex; Exner postulated a subcortical “pleasure [*Lust*] center”; and Freud theorized that the “wishful state” was the mechanism that drives the economics of pleasure–unpleasure, the primary process and the dynamics of symptoms and dreams, here,

the hallucinations. At this juncture we shall dispense with neurons entirely and only deal with the emotions, images, and actions involved in the experience of satisfaction.

The hungry infant is in a state of “urgency of wishing,” or “wishful activation” to overcome unpleasure and to achieve pleasure. This state can have two outcomes: (a) a pseudo-solution Freud calls “an internal change,” and (b) a real one, which entails action in the real world of people and real help. The internal (pseudo) solution entails a dream wishful state that “will produce the same thing as a perception—namely a *hallucination*,” (S.E. 1, p. 319, emphasis Freud’s), and a motor discharge, namely, “expression of emotion, screaming” (S.E. 1, p. 317). But with dreaming and screaming “disappointment cannot fail to occur” (S.E. 1, p. 319), for dreams and hallucinations soothe but temporarily and do not nourish: “The human organism is incapable of bringing about the *specific action*” (S.E. 1, p. 318) of satisfaction and cessation of the hunger pain. Therefore, a real solution is needed, and this can only take place “by extraneous help,” the “attention of the an experienced person drawn to the child’s state by [the child’s] discharge,” such that the child’s screaming, and motor “discharge acquires a secondary function of the highest importance, that of *communication* and the initial helplessness of human beings is the *primal source* of all *moral motives*” (S.E. 1, pp. 317, 318; emphasis Freud’s). In one leap Freud covers the entire psychological and evolutionary process, from monadic brain psychophysiology to dyadic dynamics, from biology to moral values.

The flaw is in assimilating hallucination to perception, rather than properly equating hallucination with imagination and with the memory of a previous experience of satisfaction, reproduced as hallucinatory fantasy. But the error in classification aside, it is absolutely necessary, in order to survive, that the human be able to tell hallucination apart from perception. This brings us to a critical issue in Freud’s psychology. Here is Freud’s dual solution, as presented in the *Project*: a unified model combining the psychology of dreaming with the physiology of discharge of energies.

The essence of the “experience of satisfaction” is defined by the most important qualities, those of pleasure and unpleasure, or pain, where unpleasure spells tension and “pleasure would be a sensation of discharge” (S.E. 1, p. 312), that is, detension, as in hunger and satiation, or as Havelock Ellis would later say of sexual tension, tumescence and detumescence. Any uninhibited flow of sensations, currents, or energies, of unpleasure or pleasure, is by definition primary process, the latter first defined energetically, or economically, for in Freud’s lexicon “economic” means dealing with energies, applying the metaphor of managing money to expenditure of any other form of energy. But primary process is also

. . . wishful cathexis [an energy concept] to the point of hallucination . . . described by us as *psychical primary process*; by contrast, those processes which are only made possible by a good cathexis of the ego, and which represent a moderation of the foregoing, are described as *psychical secondary processes*. It will be seen that the necessary condition of the latter is a correct employment of the *indications of reality*, which is only possible where there is inhibition by the ego. (Freud, 1950, pp. 326–327; emphasis Freud’s)

Dreams and hallucinations are embodiments of primary processes defined not only energetically, but also exegetically, that is, not only as energy content, but also as a meaningful content, a story, a drama. The pleasure-seeking energy-bound organism is ultimately beholden to an ego that is endowed with the secondary-process ability to control the flow of unpleasure or pleasure by its power to inhibit the flow of primary-process energies. This power of inhibition is also related to another: the ability to apply so-called indications of reality in order to tell hallucination-images and perception-images apart, “to distinguish between a perception and a memory (idea [*Vorstellung*, image],

in the original)" (*S.E.* 1, p. 325). Employing such indications of reality will later be defined as reality testing.

Which neurons carry out such functions, or how they do it, must remain a matter for speculation; that such functions exist is a basic psychological fact. Ultimately, this ability of the person has its source in perception and motility, both under the sway of the ego, and its biological survival purpose is to awaken the person from the dream state of wishful hallucination.

The theory of primary process resulted in two great but flawed doctrines for states of health and disease: that dreams are wish fulfillments (Freud, 1900) and that symptoms are disguised forms of sexual drive gratification (Freud, 1905), both theories stressing physiology over psychology, energy over meaning, id over ego. In the case of dreams, Freud forgot that the fabled wish fulfillment is a reaction to frustrating reality and the trauma of the day's residue (Lothane, 1983); in the case of symptoms he was still far from grasping the role of aggression in pathogenesis; in both, he was still inarticulate about the power of love and oblivious to the dyadic nature of symptoms (Lothane, 1997a).

For now, as outlined in the *Project*, since infant psychology and the notion of primary and secondary process are implicated in the dynamics of hallucination, and since hallucination is a prime manifestation of pathology, the time has come to discuss Freud's ideas about psychopathology.

B: PART II—PSYCHOPATHOLOGY

Having paid his dues to neurological science, Freud is safely back in the realm of his own new psychoanalytic psychology. Part II of the *Project* opens with the psychopathology of hysteria, a condition in which "hysterical patients are subject to a *compulsion* which is exercised by *excessively intense ideas*" (*S.E.* 1, p. 347; emphasis Freud's).

Since excessively strong ideas are found in normal conditions as well, Freud immediately questions the difference between the psychology of the normal and that of the hysteric. It comes to this: The hysterical compulsion of excessively strong ideas differs from the normal by being *prima facie* "(1) unintelligible, (2) incapable of being resolved by the activity of thought, (3) incongruous in its structure" (*S.E.* 1, p. 348), actually meaning that is the ideas themselves that are unintelligible and incongruous. With this definition Freud turns to dynamics of hysteria already published (1894a, 1895d) and combines it with the dynamics of dreams, with which he is currently occupied, in preparation of his epoch-making *Interpretation of Dreams*.

In his usual terse and incisive style Freud sets forth two key methodological-dynamic concepts: (*a*) the transformation dynamics of symptoms and dreams and (*b*) the function of defense.

Before the analysis *A* is an excessively intense idea, which forces its way into consciousness too often, and each time give rise to weeping. The subject does not know why he weeps at *A*; he regards it as absurd and cannot prevent it. After the analysis, it has been discovered that there is an idea *B*, which justifiably gives rise to weeping and which justifiably recurs. . . . The effect of *B* is not absurd; it is intelligible to the subject and can even be combatted by him.

B stands in a particular relation to *A*.

For there has been an occurrence which consisted of *B* + *A*. *A* was an incidental circumstance; *B* was appropriate for producing the lasting effect. The reproduction of this event in memory has taken a form of such a kind that it is as

though *A* had stepped into *B*'s place. *A* has become a substitute, a *symbol* for *B*. Hence the incongruity: *A* is accompanied by consequences which it does not seem worthy of, which do not fit in with it.

The formation of symbols also takes place normally. But a hysterical *symbol* behaves differently. . . . The hysteric who weeps at *A* is quite unaware that he is doing so on account of the association *A—B*, and *B* itself plays no part at all in his psychological life. The symbol has in this case taken the place of the *thing* entirely. . . . Whenever anything is evoked that cathects *B*, *A* enters consciousness instead of it. Indeed, one can infer the nature of *B* from the provoking causes, which—in a remarkable fashion—evoke *A*. We can sum the matter up: *A* is compulsive, *B* is repressed (at least from consciousness). Analysis has led to the surprising conclusion: that for every compulsion there is a corresponding repression, that for every excessive intrusion into consciousness there is a corresponding amnesia. . . . The pathological process is one of displacement, such as we have come to know in dreams—a *primary process* therefore. (Freud, 1950, pp. 349–350; last emphasis added)

The ideas in the above passage show how far Freud went beyond his predecessors in shaping his own new dynamic psychology. The symptom represents a fusion of emotion, perception, memory, imagination, conflict and defense: The symptom is constructed like a dream. The homology of structure cannot be emphasized enough, for it is not the same as the opposite statement—that the dream is like a symptom, which is commonplace enough. To say that the symptom is like the dream means that, like the dream, the symptom has a two-tiered structure, a manifest content and a latent content. The further similarity is in the mode of causation: the symptom is an encoding of a traumatic event; the dream, of a traumatic day residue (Lothane, 1983).

The manifest content of the symptom is unintelligible and incongruous, it has to be deconstructed into its components by the process of analysis to yield its latent encoded content, the unconscious (i.e., repressed by defense) intermediate ideas and ideational links in the chain of meaning. However, this analysis cannot be accomplished by a mere effort of thought, it requires a special technique which Freud will elaborate later in the *Interpretation of Dreams*: the technique of free association, such that the encoding of the dream and symptom and the decoding in the process of analysis are compatible mirror images of each other (Lothane, 1994a). For now it is essential to grasp the central dynamics in the formation of dreams and symptoms embedded in the *trans* in transformation (and, by extension, transference, Lothane, 1983), and the *meta* in metaphor. In the formation of metaphor, symbol, dream and symptom, dynamic processes of transfer, transposition, and displacement (here called symbolization, to mean substitution of one thought by another) are involved. Before we saw Freud concerned with the transposition of affects and emotions (Freud, 1894a); here we are looking at the transposition of the latent idea into the manifest one, the overt symptom.

The crucial juxtaposition here is between energetics *vs.* exegetics, physiological energy *vs.* psychological expression, displacement of quanta of energy *vs.* displacement of qualia of meaning. Clearly, expenditure of energy and energy shifts are involved, even though this energy can neither be specified, shown, or measured, only experienced and intuited. And it is precisely here that the momentous redefinition takes place from primary process as displacement of energy to primary process as displacement of ideas and images endowed with meaning: that is, the transfer, or transposition, or transformation, of meaning from one kind of thoughts to another, from the real to the imaginary, from the perceived to the remembered or hallucinated, from concrete images of perception to dream images of memory and imagination, as particularly evident in dreams and in the dynamics of dream work, in diurnal (day)dreams (fantasies) and nocturnal dreams.

When Freud conceived of primary processes as energy flow he assimilated from his physiologizing predecessors the notions of the experience of satisfaction and wish fulfillment occurring in a monadic mental apparatus to end in hallucination, an idea which he carried into the famous seventh chapter of the *Interpretation of Dreams* and later into his drive theories. In time the concept of primary process came to denote not only a process of mobile energies, but also a kind of mental product: the varieties of fantastic, transformist ideas and images of dreams, hallucinations, and delusions, fueled by the energies of pleasure and pain, determined by conflict and defense. This productive capability of the primary process Freud would later rename “the unconscious,” manifesting itself in the products of the metaphorical, mythopoetic, and poetic imagination, the trope, the myth and fairy tale, in short, in the works of poets and creative writers.

By comparison, as we saw, secondary process in the *Project* is associated with the notion of inhibition and defense and thus reality testing, logical and critical judgments, and goal- and duty-directed work. The inhibitory function of defense both regulates the homeostasis of pleasure and unpleasure and fuses ideational and emotional elements in the construction of dreams and symptoms. Freud’s descriptions suggest that the boundary between the organized products of the primary process and the organizing activity of the secondary process is not an absolute one.

Having defined defense as repression, Freud asks what differentiates normal repression from that employed by the hysteric, and the obvious answer is that “the greater intensity of the defensive affect is responsible for it” (*S.E.* 1, p. 352). But this is only a partial answer to the riddle. The further answer comes not from how the repressing force operates, but from what is repressed, namely, distressing sexual emotions. Freud illustrates these issues with the vignette of one Emma, in whom we can discern the workings of the “primary process . . . defence on the part of the ego . . . [and] special psychical determinants . . . in the sexual sphere” (p. 353). Emma was a sufferer from agoraphobia while shopping, the analysis of which revealed a memory of attendants laughing at her clothes in a store when she was twelve and an earlier seduction by a shopkeeper who fondled her through the clothes when she was eight years old. What Emma remembered were not the sexual interest and desire aroused in her during her seduction by the shopkeeper, but only the intermediate links, the innocent thoughts of being ashamed of her clothes. The defense against remembering the traumatic and conflict-laden emotions became the motive for this hysterical repression, in the following manner:

Now this case is typical of repression in hysteria. We invariably find that a memory is repressed which has only become trauma by deferred action. . . . Every adolescent individual has memory-traces which can only be understood with the emergence of sexual feelings; and accordingly, every adolescent must carry the germ of hysteria within him. There must obviously be concurrent factors . . . hysterics [are] individuals . . . [who] have become prematurely sexually excitable owing to mechanical and emotional stimulation (masturbation) and in whom one can assume in part that a premature sexual release is present in their innate disposition. (Freud, 1950:356–357)

Here we find unified the dynamic counterpoint of dream (displacement), desire (sexual arousal), defense (repression), and deferred trauma (recognition of the true meaning of childhood sexuality after puberty) to explain the fact of the hysteric’s “original lie” (*proton pseudos*). (*S.E.* 1, p. 356) “Attention is [normally] adjusted towards perceptions, which are what ordinarily give occasion for a release of unpleasure. Here, [however, what has appeared] is no perception but a memory, which unexpectedly releases unpleasure, and the ego only discovers this too late. It has permitted a primary process because it did not expect one” (*S.E.* 1, p. 358) Were it not for repression, Emma

would have recognized her memories directly, as they were. Since she was unable to do that, the anxiety released by the deferred, postpubertal, transient recognition of the sexual emotion (the unexpected surfacing of that awareness in the unexpected surge of sexual emotion via primary process, which took her by surprise) immediately triggered defense and ensuing symptom formation.

The above is an example of Freud's laying the foundation for his future dynamic ideas. The hysterical lie is not a conscious lie because repression is not an entirely conscious process, and only analysis can make this unconscious process conscious. Another important idea is the occurrence of a prior infantile sexual trauma, which Freud and others mistakenly thought he had repudiated (Lothane, 1987). But there was no necessity to abjure such a sound idea as the traumatic seduction of children by adults, for there never was any contradiction, only complementarity, between the premature arousal of sexuality in children and their innate disposition to spontaneous self-arousal through masturbatory activity and fantasy, the fusion of dream and desire.

In the end we see Freud completing two journeys: from mind to brain and back again, and from abnormal psychic products to normal psychological processes. This leads us into the final portion of the *Project*.

C: PART III—ATTEMPT TO REPRESENT NORMAL PSI PROCESSES?

Many normal processes have already been discussed and, in the previous section, the fluidity of the boundary between the normal and the pathological become increasingly evident. This is further suggested by the structure of dreams: pathological symptoms are constructed like dreams, and dreams are a universal capability of mankind.

Compared to the paucity of neuronal theory in Part II of the *Project*, Part III is again replete with neurons and energies in aid of Freud's still-burning ambition to "arrive at a fresh thesis for the mechanical representation of psychical processes" (*S.E.* 1, p. 375). Here he addresses such psychical processes as attention, memory, cognition, the phenomenon of error, that is, "faults in premises" and "mistakes in judgment" as well as "critical or examining thought" (*S.E.* 1, pp. 384, 386). Also, Freud here makes explicit the importance of "speech associations" that serve "communication" (*S.E.* 1, pp. 365–366), a function the acquisition of which changes the whole landscape of thought and that will reappear in his future writings.

As the explanatory power of the putative neurology is strained to its limits, a new paradigm makes its appearance: the "biological justification of all thought" (*S.E.* 1, p. 361), or the Darwinian roots of Freud's theorizing, made so much of by Sulloway (1979), in my view, a trend away from his philosophical roots (Lothane, 1981). Moreover, such biological preoccupations are not in themselves psychoanalytic and do not add anything to the creative ideas described in Part II of the *Project*.

CONCLUDING REMARKS

The purpose of this exposition is to demonstrate that Freud's thought should be viewed as an overarching line in an intellectual odyssey in which early and late contributions make a coherent whole: the greatest European contribution to dynamic psychology since Aristotle. This continuity casts doubt on the artificial division of Freud's thought into preanalytic and properly analytic: he was psychological and psychoanalytic throughout the period examined. In addition, it is important to differentiate, as was done by the Aristotelian psychologist Dalbiez (1941), between Freud's psychoanalytic method and *Freudism*, Freud's various doctrines, theories, or myths. Theories come and go, but the method endures (Lothane, 1994b, 1996, 1997b, 1997c). A classi-

cal example of Freudism is the sexual etiology of the neuroses, and fewer and fewer Freudians adhere to it nowadays, as when, under the spell of Kohut, they prefer self over sex. Now there is nothing Freudian or non-Freudian about self: it is a philosophical abstraction, which, in context, may mean person, the soul, or the ego.

Parts of the *Project* are restatements of neurological ideas of his predecessors, while some are replete with imaginative speculations about the functioning of hypothetical neurons, like the fanciful phi-psi-omega system. The other parts represent a further elaboration of Freud's theories of neurogenesis, set forth in a number of psychological works that antedated the *Project* (1894a, 1895c 1895d). However, the amount of genuine brain science in the *Project* is small compared to the preponderance of brain mythology, that is, a restatement of common psychological phenomena, such as thought, perception, memory, dreaming, and speech, in the language of brain anatomy and physiology.

Freud's brain doctrine, or myth, is that brain causes mind, a view valid in conditions of organic brain lesions and intoxications, but even there with certain qualifications. Neuroscientists and biological behaviorists today are increasingly aware of how psychological functioning alters brain functioning, a view espoused by a prominent neuroscientist of our times (Eccles, 1994) and a challenge for psychiatry of the future (Bar-chas, 1996).

Freud had already dealt psychologically with such functions as perception, dream, fantasy, and memory, all functions of the person and not just material particles, ideas he found in the work of his philosophical authorities: Kant, Herbart, and Brentano. In the last decade of the nineteenth century Freud enriched these traditional ideas by his own new methodological-dynamic concepts:

- (1) The meaning of the language of neurotic symptoms (*Studies on Hysteria*, 1895d);
- (2) The method of conscious and unconscious dynamic processes of defense, or repression, related to the handling of trauma, unpleasure and pleasure, and conflict;
- (3) The role of memory, myth, and metaphor in the formation of symptoms and dreams, the homology of the two-tiered structure of symptoms and dreams (*The Interpretation of Dreams*, completed in 1899), as caused by a traumatic event in the former, or by the day residue in the latter. This further translates into the homology of the dynamics of dream-work, hallucination-work and delusion-work, the transformation dynamics based on the affinity between the dream and poetics, as seen in tropes and figurative speech, such that one idea is represented by another;
- (4) the language of love and transference love, of conflicts of love as distinct from conflicts of sexuality, transference operating unconsciously; and
- (5) The Breuer and Freud cathartic method of emotive recall and abreaction that led Freud to his own psychoanalytic method founded on dream psychology and free-association, a dual method of treatment and research of mental formations in health and disease, formulated in *The Interpretation of Dreams*.

In agreement with Sulloway (1979, p. 130), I have spelled out how the *Project* is "a multifaceted work reflecting far more than the reductionist manifesto that ostensibly proclaimed its guiding rationale"; I also concur with similar conclusions reached by Forrest (1995). While medicine brought home to Freud the importance of the body and its biological needs that left an imprint on many of his doctrines, most tellingly sexuality, in his psychoanalytic methodology he remained a slave to his tyrant psychology, in Nietzsche's phrase, the Queen of the Sciences.

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