

THE BRAIN: FLUIDS, DYNAMIC CHOICE AND MENTAL EFFECTS[†]

James L. Pendleton*

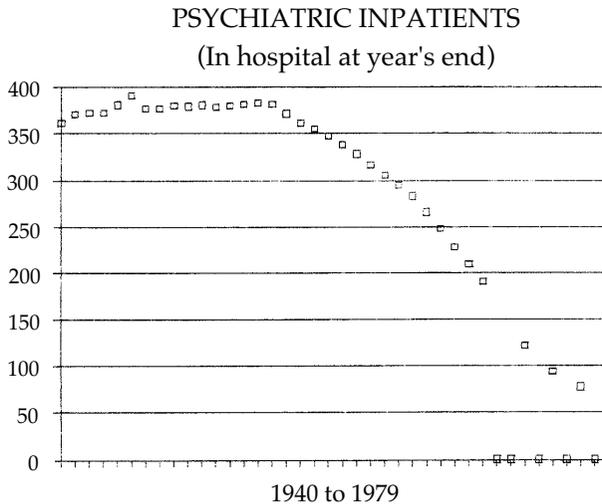
The Mental and the Physical in Psychiatry

There are two fundamental aspects of psychiatry. The first is the mental part. That has to do with mental concepts and reactions modified mostly by learning, talking, or psychotherapy. There are many interesting parallels in psychotherapeutic concepts in psychiatry and teachings from the Writings.

However, tonight I'm going to talk about the second aspect of psychiatry, the physical. I'll discuss brain anatomy and functions, major psychiatric conditions and medications and also will discuss some of Swedenborg's concepts as they relate to present-day ideas.

Evidence of Physical Basis

The following are some scientific studies that indicate physical causes for some of the major psychiatric problems:



[†] This paper was presented at the ninety-third Annual Meeting of the association on April 30, 1990.

* Dr. Pendleton practices general psychiatry and is board certified. In addition to training in psychiatry, he spent two years of residency training in pathology. He is a member of the boards of directors of the Academy of the New Church and the Swedenborg Scientific Association.

This graph shows the number of patients in U. S. psychiatric hospitals per 100,000 population at the end of each year, from 1940 to 1977.

Beginning in 1956 a profound drop in psychiatric hospitalization began, from approximately 390 per 100,000 before 1956 to 64 per 100,000 people in 1977, the last year these statistics were kept. The beginning of the decrease coincided with the introduction of Thorazine, the first of the medications that treated the psychoses effectively.

A second type of evidence comes from studies of patients who have responded to medication. For patients whose medication was stopped, the relapse rate was approximately three times that of patients whose medication was not stopped.

Adoption studies also provide evidence for the physical cause of psychoses. One study followed two groups of children adopted just after birth. One group had a history of schizophrenia in the natural family but were adopted into a family in which there was no schizophrenia. The other group of adoptees had no history for schizophrenia in the natural family, but one of the adoptive parents became psychotic during the growing up of the child. The development of schizophrenia later in life correlated with heredity, not the family of rearing.

Twin studies also give evidence of the genetic effects in schizophrenia and manic depressive illness. Identical twins are believed to have identical genes, and therefore the same heredity. The genes or heredity of non-identical twins is no closer than that of other brothers and sisters.

If one identical twin has the disease, the chance of the other getting it is 50-70%. If one non-identical twin has the illness, the chance of the other twin getting it is about 15%, the same as for other siblings.

Identical twins separated before age two and then re-united as adults, showed striking similarities in normal mental characteristics.

Positron emitting tomography, or PET scans, show a difference in metabolic activity in certain areas of the brains of people with psychosis compared to people who have never been psychotic.

Magnetic Resonance Imaging (MRI) scans show that patients with schizophrenia have less brain tissue, particularly in the frontal lobes, compared to people without schizophrenia.

Mental function depends on a basis of anatomy and physiology.

Harmony of Mental Function

Let's look at a schematic of some the complex functions of the mind. Picture lines connecting all of the functions shown in the diagram, around the circle and criss-crossing through the middle. They all interact in harmony.

MENTAL FUNCTIONS

COGNITION

JUDGEMENT

IMAGERY

PERCEPTION

EMOTION

SENSATION

Swedenborg speaks of harmony in the introduction to *The Brain*:

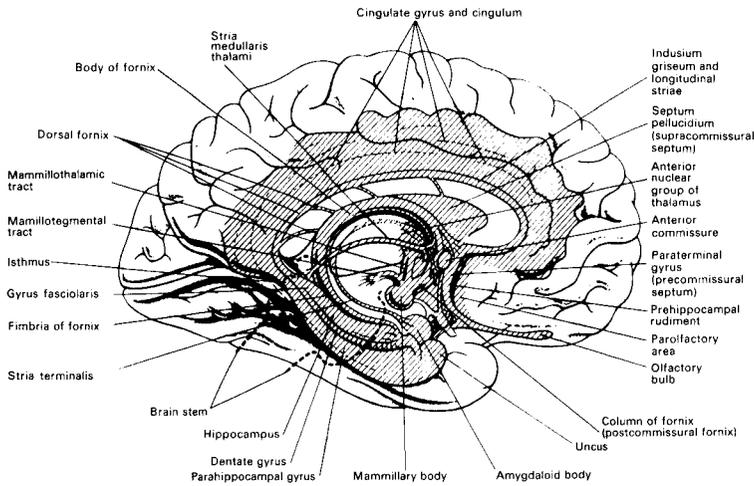
There is...a wonderful intermediate bond, according to which that which is highest or supreme flows into that which is lowest, and the lowest flows back to the highest; so that all is in concord;...There is one mind and a unanimous consent in all things, and hence an influx and reflux;...a harmony which is co-established...(in) which the highest or supreme ideal contemplates...itself...as pre-established, because as simultaneous. (*The Brain*, Vol. I, p. 1)

Swedenborg's Animate Spheres, and Present Understanding

...in every series,...there must be three spheres..., first, the sphere of principles; secondly, that of causes; and thirdly, that of effects. (*Ibid.*, p. 2)

(1) The sphere of effects in our animate world is...[the] body,...constituted by the viscera of the abdomen and the thorax, and by the organs of motion and of the external senses. (2) The sphere of causes is...the...cerebrum, the cerebellum, the medulla oblongata, and the spinal marrow. The sphere of principles, finally, is the cortical and grey substance. (*Ibid.*, pp. 2-3)

LIMBIC SYSTEM (SHADED AREAS)



Compare present conceptualization of anatomy and function. The shaded area shown here is called the limbic system. The limbic system associates emotion to external events as well as internal events, such as thoughts.

The limbic system does not include the cerebellum. Present-day texts on the nervous system assign to the cerebellum only the function of coordinating motion.

However, Rev. Stephen Cole, in his talk to the Swedenborg Scientific Association four years ago, brought to light the work of Heath and others published twenty years ago that corroborated an emotional function for the cerebellum as Swedenborg stated.

The following shows Swedenborg's three animate spheres. It also describes the functions assigned today to the cortex and to the limbic system, which roughly correlate with the first two spheres described by Swedenborg.

THREE ANIMATE SPHERES

I. *SPHERE OF PRINCIPLES—CORTICAL (& GREY) SUBSTANCE:* (Functions as understood today of reasoning, judgment, restraint of emotions, memory, sensory perception, motor control.)

II. *SPHERE OF CAUSES—SUB-CORTEX TO SPINAL CORD:* (Functions as understood today of substrate of emotion, emotions of interpersonal and sexual nature, self-preservation, visceral control.)

III. *SPHERE OF EFFECTS—BODY:*

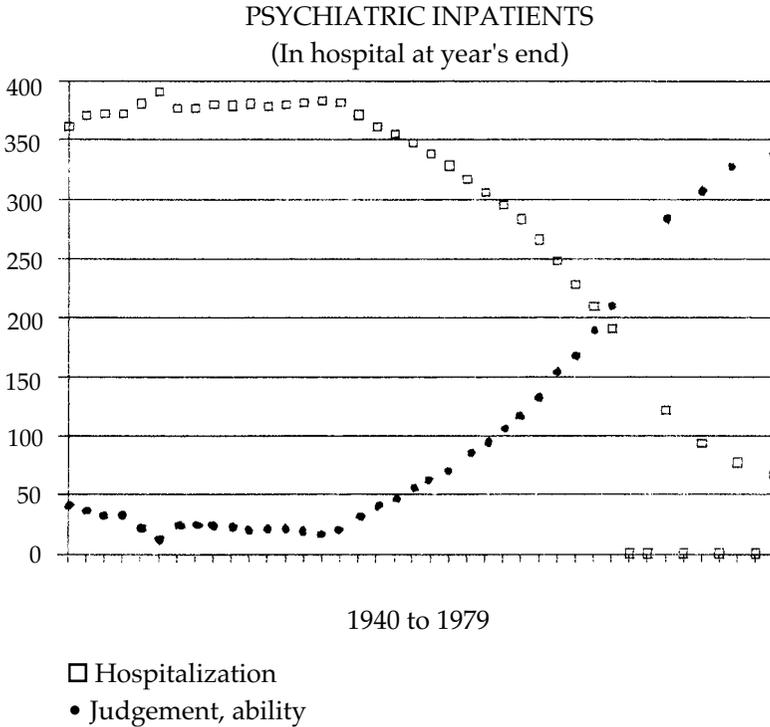
Psychiatric Medications Versus Drugs of Abuse

I mentioned that medications are used to treat psychiatric illness. How do the effects of medications compare with the effects of drugs of abuse? The drugs of abuse, including alcohol, decrease functions in the cortex. (See above table, part I.) They also bring pleasurable intoxication, increasing tolerance and ultimate abuse. The anti-anxiety medications, such as Valium and Librium, have similar effects, but lesser tendency to produce physical dependence and addiction.

The medications that treat the psychoses and certain kinds of depression decrease overactivity of functions of the limbic system. When they work well, they bring excessive, inappropriate emotion under control, eliminate hallucinations and delusional ideas, and restore higher cortical functions of judgment and reason. These antipsychotic and antidepressant

medications have potential side effects and aren't effective for everyone. However, the most important ones have no intoxication, no build up of tolerance and no potential for abuse.

Restoration of Functions, the Inverse of Hospitalization



This graph includes the plot of the effect of medication on inpatient hospitalization shown before. The “Martin Echols line” has been added. As Martin pointed out, the reciprocal of the hospitalization rate shows the effect of medication in restoring the judgment, perspective and freedom of choice required to live outside of the hospital.

In my own practice, I see some people once every 3 to 6 months for 20 minutes. If their condition doesn't worsen and they continue their medication at the right dosage, they don't need psychotherapy any more than anyone else. If they stop their medication, the problem usually returns.

Nerve Tissue Adaptation, a Basis of Dynamism of Life

Before closing, I'd like to comment about process of nerve tissue adaptation, and its effect on our mental functioning. Adaptation is the tendency of a nerve cell to decrease its frequency of firing impulses, even when a stimulus is continued at the same intensity.

This effect means that we rather rapidly lose awareness of stimuli or situations that stay the same. The novelty wears off. Our lives can't be static; they must involve ongoing creativity. We can't be well-adjusted; we have to be well-adjusting. Nobody has it made; at best they're making it. And who knows tomorrow? It seems to me that adaptation is the physical basis for perfecting one's use to eternity.

Fluids and Cell Choice

It's amazing to me we can put a medication into the body, and so into the whole brain, and have it do good where it's needed. That seems like fixing a radio or car engine by pouring a bucket of something on it or dusting powder into it.

Swedenborg seemed to make a big thing of fluids and cells. But on reflecting, it's the presence of nourishing fluids, and selectivity of the cells, that make it possible for medication to work without short-circuiting the whole brain.

In addition to the effect the fluids and cells have on mental function, there is a kind of correspondential parallel to people, like the cells, being able to take from, and contribute to, a nourishing atmosphere in society according to their specific abilities.

Mental illness impairs the ability to give and take effectively with the people and ideas around us. It impairs the ability to learn, judge and choose effectively.

The proper goal of psychiatric treatment is to help people improve their mental functioning and become more effective themselves, including through treating brain function, which is the natural basis of the mind. □

