

Thomas A. Ban: Education in Biological Psychiatry – Homage to Dr.
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Introduction

I would like to thank Dr. Marc-Alain Wolf for inviting me to participate in the 1994 Skitch symposium. For me personally, Douglas Hospital will always remain a special place, because it was the research I had conducted here in collaboration with Dr. Lehmann, which provided me with the necessary background for the writing of my monographs, *Conditioning and Psychiatry* (Ban 1964) and *Psychopharmacology* (Ban 1969).

I consider myself especially privileged to be with Dr. Lehmann on this panel on psychiatric education, because it was Dr. Lehmann who turned my psychiatric training, the learning of “when” and “what” to do, into a psychiatric education, i.e., into a learning of “why” to do it. It was also Dr. Lehmann who focused my attention on the need to separate facts from beliefs and hypotheses from speculations.

Cnidian Tradition

There are two main traditions of medicine, the Coan (School of Hippocrates) and the Cnidian (School of Euryphon), and the two traditions are diametrically opposed (Table 1). While the Coan tradition is focused on the patient rather than the disease, the Cnidian tradition is focused on the disease rather than the patient. While within the Cnidian tradition disease is perceived as an entity and the aim of treatment is specific therapy, within the Coan tradition disease is perceived as a battle between the *materies morbi* and the “natural self-healing” (*physis*) of the body and the aim of treatment is to assist the patient through his/her own particular nature to react in his/ her own way against the morbidity (Garrison 1960).

Medical education today is pursued within the Cnidian tradition – in spite of the frequent reference to Hippocrates – and since biological psychiatry was conceived as a branch of medicine, biological psychiatry operates within the Cnidian tradition

exclusively. It is focused on the disease; its ultimate aims are diagnosis and classification, detection of pathomechanisms and development of specific therapies.

Mental Disease

In variance with the Coan tradition, in which mental disorders are perceived as "variations of madness with merging boundaries," in the Cnidian tradition mental disorders are perceived as distinct entities which qualify for disease categories. Accordingly, education in biologic psychiatry remains restricted to the knowledge necessary for the detection of symptoms, recognition of disease, determination of pathology and identification of specific therapy.

The three major conceptual frameworks which led to our current concept of disease are those of Galen (131-201), Sydenham (1629-1689) and Morgagni (1682-1771).

Table 1

	Coan School	Cnidian School
Head	Hippocrates	Euryphon
Work	Corpus Hippocraticum	Cnidian Sentences
Focus	Patient	Disease
Concept of Disease	Battle between <i>materies morbi</i> And "natural self- healing" (<i>physis</i>)	Entity
Concept of Treatment	Assist patient Through his/her Own particular nature To react in his/her own way against morbidity	Specific Therapy
Contribution	Bedside Method	Academic Medicine

Distinctive characteristics of Coan and Cnidian traditions of medicine.

Galen perceived disease in terms of "symptoms" and "signs" which follow the disease as a "shadow of its substance" and "show what the disease is" and "how it will end," i.e., provide for diagnosis and prognosis, respectively; Sydenham perceived disease

in terms of “process” with a “natural history of its own” that “runs a regular and predictable course”; and Morgagni perceived disease in terms of “detectable morphology” which, for him, because of the limitations of available technology, was restricted to “pathologic anatomy,” but by now, as a result of technologic progress, also includes pathologic histology, physiology and biochemistry.

To achieve its disease-oriented goals, while predetermined by the need to qualify for disease within each of the three major conceptual frameworks, education in biologic psychiatry is based on:

general psychopathology (psychopathology) – which provides the essential knowledge for the detection of signs and symptoms necessary for the identification of a nosologic entity;

clinical psychopathology (nosology) – which provides the essential knowledge for the recognition of patterns necessary for the differentiation of one nosologic entity of disease from another;

pathophysiology – which provides the essential knowledge for the necessary understanding of brain functioning that determination of pathology if related to brain functioning in possible; and

psychopharmacology – which provides the essential knowledge for specific therapy and the methodology necessary for the detection of the morphologic substrate (at the molecular level) associated with and/or responsible for pathologic brain functioning (Table 2).

Table 2

<u>CONCEPTUAL FRAMEWORK</u>	<u>GENERAL PRINCIPLES</u>	<u>EDUCATION IN BIOLOGIC PSYCHIATRY</u>
Gales (131 -201)	Perceived disease in terms of <u>symptoms and signs</u> which follow disease as a shadow of its substance and show what the disease is and how it will end	<u>General psychopathology:</u> Provides the knowledge for the <u>detection of symptoms and signs</u> necessary for the identification of a nosologic entity of disease

Sydenham (1624 – 1689)	Perceived disease in terms of <u>process</u> with a natural history of its own that runs a regular and predictable course	<u>Clinical Psychopathology (nosology)</u> : Provides the knowledge for the <u>recognition of patterns</u> necessary for the differentiation of one nosologic entity of disease from another
Morgagni (1682 – 1771)	Perceived disease in terms of <u>detectable morphology</u> which for him was restricted to pathologic anatomy, but by now it also includes pathologic histology, physiology and biochemistry	<u>Pathophysiology (psychic reflex)</u> : Provides the knowledge for the necessary understanding of brain functioning that determination of pathology is possible <u>Psychopharmacology (therapy & methodology)</u> : Provides the knowledge necessary for specific therapy; and the methodology necessary for the detection of the morphologic substrate (at the molecular level) associated with and/or responsible for pathologic functioning

Development of a Curriculum

At present, it is unrealistic to expect that empirically derived measurements will replace traditional psychiatric concepts in the foreseeable future. Therefore, the usefulness of biologic homogeneity in terms of a particular measure, within a particular diagnosis, is questionable unless the sub-population within the diagnosis can clearly be identified clinically. The same applies to genetic data and pharmacologic responsiveness to psychotropic drugs. Because of this a curriculum in biologic psychiatry includes exposure to modern molecular genetics, neurochemistry and brain imaging, while it is focused on general and clinical psychopathology, pathophysiology and psychopharmacology.

General and Clinical Psychopathology

General psychopathology, or simply psychopathology – a term coined by Feuchsterleben (Emminghaus 1878; Feuchtersleben 1845)) – is the scientific discipline which deals with the identification, description and conceptualization of psychopathologic symptoms (phenomenology) and signs (performance psychology), the elementary units of mental illness. Considering that detection of psychopathologic symptoms and signs is a prerequisite for the recognition of disease patterns, which is in

the focus of biologic psychiatry, general psychopathology is one of the two essential components of the curriculum in biologic psychiatry.

Development of general psychopathology was triggered by Jaspers' (1913, 1962) adoption of the Aristotelian (384-322 BC) distinction of "content" and "form" in the analysis of psychopathologic symptoms. And, his recognition that the "content" of psychopathologic symptoms is learned, i.e., derived from past experience, whereas the form of the psychopathologic symptoms is predetermined, i.e., determined by (and characteristic of) illness, led him to separate disease process, expressed in behavior and events and their corresponding contents. It is the distinct difference in emphasis on the content or on the form of psychopathologic symptoms which led to the separation of education in biologic psychiatry (focused on forms) from education in dynamic psychiatry (focused on content).

In recent years it has been increasingly acknowledged that it is not the psychopathologic symptoms which create the illness, but it is the illness which determines its symptoms. It was this recognition which led to the cutting of ties between biologic psychiatry and psychology, which, in turn, opened the path for an education in biologic psychiatry which is built on the basic sciences that serve all medical disciplines.

It is a well-recognized fact that in mental illness, similar to other illness, symptoms and signs – useful in the detection of the condition – do not express the disease pattern, i.e., the entire illness. This implies that in the formation of mental illness factors other than those responsible for the formation of psychopathologic symptoms also play a role. Included among these other factors are those responsible for the spatial (perceptual-cognitive, relational-affective, motor-adaptive) and temporal (episodic vs continuous) representation of psychopathologic symptoms, and the factors responsible for polarity (simple vs multiform) and totality (homologous vs heterologous) in representation of the symptoms. Considering that pattern (disease) recognition – which is in the focus of biologic psychiatry – is the prerequisite also for specific treatment, clinical psychopathology is the other essential component of the curriculum of biologic psychiatry.

Pathophysiology and Psychopharmacology

Griesinger's (1843) recognition – despite his belief expressed in “unitary psychosis” – that there are mental syndromes, i.e., expressions of pathology, without

detectable changes by pathologic brain anatomy made him explore the possibility of detectable changes by pathologic brain physiology. To render pathologic changes of brain physiology accessible to scientific scrutiny, he was first to consider the "psychic reflex," intimately linked to brain activity, useful for the study of brain functioning. It was more than 20 years after Griesinger's (1843) first description of the "psychic reflex" that Sechenov (1866) published his classic text, *Reflexes of the Brain*.

The psychic reflex was adopted by Wernicke (1900) as the functional unit of psychiatric disease. By dismissing the traditional belief of stepwise localization of mental faculties and replacing it with a model in which psychopathologic symptoms are perceived as the result of the "loosening" of or "detachment from the rigid structure of the reflex arc" in the transmission of impulses from sensory input through transcortical connection to motor output, Wernicke (1900) created the frame which is being filled in by modern psychopharmacologic research.

Introduction of the psychopharmacologic method rendered psychopathologic symptoms accessible to pharmacologic manipulation. And, findings that the differential action of psychotropic drugs on psychopathologic symptoms is intimately linked to their differential receptor affinity and, assumedly, to their differential effect on the transmission of impulses at the synaptic cleft generated hypotheses which are of practical and heuristic significance. One of the heuristic hypotheses is that psychopathologic symptoms are manifestations of pathology in the processing of experience in the brain.

If it is true that psychopathologic symptoms are manifestations of pathology in the processing of experience (impulses) in the brain, and that the differential action of psychotropic drugs on psychopathologic symptoms is intimately linked to their differential action on the synaptic cleft, then testable hypotheses with practical significance are:

- forms and sub forms of disease which are based exclusively on the spatial representation of psychopathologic symptoms should be accessible to psychotropic drugs with an effect on the transmission of impulses at the synaptic cleft;
- forms and sub forms of disease which are based on temporal representation of psychopathologic symptoms should not be accessible to treatment with psychotropic drugs which affect the transmission of impulses at the synaptic cleft

only, but should be accessible to treatment with drugs (or a combination of drugs) which combine an effect on the "on and off" regulation of pathology in the processing of experience with an effect on the transmission of impulses at the synaptic cleft; and

- forms and sub forms of disease which are distinct in spatial representation of psychopathologic symptoms – even if similar in terms of polarity and temporal representation – should respond differentially to the same psychotropic drug because of the differences in the regional distribution of the receptors relevant to the action of the substance.

Although conclusive evidence based on properly designed and conducted clinical experiments supporting these hypotheses is lacking, it has been the clinical experience that forms and sub forms of disease which are based exclusively on the spatial representation of psychopathologic symptoms respond to psychotropic drugs with an effect on the transmission of impulses (processing of experience) at the synaptic cleft; that in forms and sub forms of illness which are based on temporal representation of psychopathologic symptoms, treatment with drugs with an effect only on the transmission of impulses (processing of experience) in the brain does not suffice, and to attain a therapeutic response it must be combined with treatment with drugs with an effect on structures involved in the temporal regulation of the structures responsible for the processing of experience; and that forms and sub forms of disease which are distinct in the spatial representation of psychopathologic symptoms respond differentially to the same psychotropic drug. Findings in several pilot studies are supportive of a differential responsiveness to treatment with the same drug in different sub forms of the same illness.

To all of this there is little I would like to add. Personally, I believe that my proposed curriculum would provide for an education in "a psychiatry which is practiced exclusively as a medical discipline," or as Zilboorg (1941) referred to the psychiatry of Esquirol, a "psychiatry without psychology. "

Concluding Remarks

In closing I would like to say a few words about the limits of education in biologic psychiatry.

In this context I would like to remind you that William Cullen (1769), the Scotsman who, through Benjamin Rush and Phillipe Pinel, had a strong influence on both

early American and early French psychiatry, believed that "all the diseases with their seat in the nervous system are associated with, and/or result in mental derangement" (Littre 1877). He coined the term "neurosis" in reference to this all-embracing category of disorders. By the 1840s, it was recognized that not "every defect of the nervous system is necessarily accompanied by mental disorder," although it was still believed that "every mental disorder implies the existence of a disease of the nervous system" (Pichot 1983). It was to prevent confusion that the word "psychosis" was introduced by Feuchtersleben (1845) for the separation of those neuroses which are associated with mental derangement from those neuroses which are not.

In the ultimate analysis, it was the introduction of the concept of psychosis which, by separating neurologic disorders from psychiatric disorders within the neuroses, provided the necessary frame of reference for the development of the discipline referred to as psychiatry today, setting the limitations of education in biologic psychiatry within *the boundaries of the psychoses* at one end.

At the other end, education in biologic psychiatry remains restricted within psychiatry to the disease, i.e., on how and to what extent the disease affects the person, and it does not extend to on how the person, depending on his/ her personality, responds to the disease and how the person, depending on the social structure in which he/she lives, can adjust to society with his/her disease. This restriction to the disease provides an education in biologic psychiatry which can prevent the confounding of medical and social issues and, I believe, can provide a psychiatric service which is affordable to the community.

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