A BIOMETRIC APPROACH TO PSYCHOPATHOLOGY*

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There are a variety of approaches that have been used in the past for detecting and evaluating psychopathology. Among these may be mentioned the psychiatric approach, the psychological approach, physiological approach, phenomenological approach, clinical approach, and many others. The biometric approach, which we represent, was hardly heard of in the halls of psychopathology before the end of World War II. Biometrics is a science which applies measurement to living organisms. The biometric approach to psychopathology is essentially an attempt at a scientific evaluation of the behavior of mental patients, including their characteristic thoughts and emotions, as well as overt behavior. The scientific evaluation of the behavior of mental patients now falls into the interstitial area between the social, medical, and physical sciences, and there is no one discipline in which the objective measurement of this behavior can be pursued regardless of territorial rights. Biometrics research is trying to provide a platform for the study of the behavior of mental patients with whatever measures become available. While no justification for introducing objective measures is necessary, one need only point to the three or four billion dollars spent annually for mental disease in this country and the two-thirds of the budget of New York State spent on mental hygiene to indicate the importance of measurement in this field.

Furthermore, a veritable revolution has taken place in psychopathology during the last decade. In order to keep up with these changes, to evaluate their direction, and guide their development, new measuring devices are required. The static measures of yesteryear can hardly meet the requirements of today's dynamic upheavals in the care, treatment, and research of the mentally ill. Perhaps a comparison between the psychopathological revolutions and the more common political revolutions may prove enlightening.

In most political revolutions, the energy released accomplishes much good and some, perhaps, unnecessary evil. The status quo is challenged, law and order are at least temporarily overthrown, prison doors are unlocked and thrown open, newcomers previously belonging to the outcast group come to the fore, the national treasury is confiscated, and finally the revolutionists settle down to become conservatives and be eventually overthrown in turn.

The revolution in psychopathology has not been as drastic as

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political revolutions in certain countries are, but certain parallels between these two types of revolutions can be readily found. Unlike political revolutions, the psychopathological revolution occurred quietly, subtly, without public furor, but its effects are no less telling.

Law and order, as represented in our diagnostic classifications, and type of patient admitted and released, have undergone a considerable change. The diagnostic nomenclature has undergone a serious face lifting in the mental diseases and radical extirpation in the mental deficiencies. Whether these operations were a success is still debatable. The hospital doors have been thrown open, the prison-aspect of our institutions is gone, release rates have been doubled in the mental diseases, and admission rates have risen in both types of disorders. Clinical psychologists, sociologists, anthropologists, statisticians, biometricians, biochemists, geneticists, pharmacologists, behavioral scientists, and others, seldom involved in research in psychopathology during the thirties, are now recognized as important contributors. The separation of mind and brain — that a firm tenet of the thirties — is no longer regarded as a stumbling block in integrated attacks on mental disorders. Funds for research, rather scarce in the thirties, are now, if not ample, at least available from the national treasury.

It can readily be seen that no single discipline can hope to cope with the wide area of measurement called for. For this reason, biometrics research has corralled the interests of anthropology, sociology, psychiatry, social psychology, experimental psychology, statistics, psychopharmacology, neurology, internal medicine, and a variety of other disciplines that are needed in order to encompass the wide spectrum of measurement required.

The overall program of biometrics research involves two aspects, one of practical and the other of theoretical import: objectification of current clinical practice; provision of scientific models for etiology, and testing of their implications.

In connection with the first of these, it is generally recognized that there are many important clinical concepts, very useful in everyday clinical practice, which are usually evaluated subjectively and intuitively. One function of biometrics research is to provide objective measures of the factors underlying these clinical concepts and impressions. Examples of this would include our work on the development of an index of type of onset of illness, based on the study of premorbid adolescent friendship patterns, and, our investigation of the cloze procedure as a means of comparing the "intelligibility" of normal and schizophrenic speech.
Also, within this first category lies the problem of standardization of the observations upon which diagnosis, prognosis, and degree of improvement are based. Here we are developing inventories, ranging in content from mental status to ward behavior.

One of the problems to which these methods are now being applied is a sampling survey of hospital activities. The purpose of this study is to provide more adequate information about daily hospital routine, kinds of patients admitted, released, placed on treatment, moved within the hospital, etc., than has been available. To determine whether the tranquilizers distributed to the patients are actually ingested, the observational techniques will be supplemented by urine-analysis methods. Attitudes of the personnel toward the patients will be gauged by specially devised scales. It is hoped that these methods will provide the kind of hospital statistics which will be of most use. Burdock and Hardesty, whose paper is first in this monograph, will discuss observational techniques, especially with regard to children.

The second aspect of biometrics research has to do with the development and investigation of various scientific models for psychopathology. The models being considered by our group are: (1) neurophysiological, (2) learning theory, (3) developmental, (4) sociocultural, and (5) epidemiological. We have not yet dealt with the heredity model nor with internal environment as a model, except incidentally.

Our research program has included several studies investigating the neurophysiological model. This model is represented by two of the papers to follow. First, Hakerem and Sutton will present their work in pupillography, and then Sutton and Roehrig will discuss their studies of delayed auditory feedback. These two studies are part of a general investigation of the physiological, sensory, perceptual, and psychomotor characteristics of schizophrenic patients, as compared with normals under specified conditions of stimulation.

The learning theory model has led Salzinger and his coworkers, Portnoy and Feldman, to investigate verbal behavior and its modification, mainly through operant conditioning procedures. Their contribution to this book will deal with the use of the "cloze procedure" to study the alleged impairment of verbal response chains in schizophrenic speech.

The developmental model is not represented by a paper in this volume, but, an example of the work in this area is our study of adolescent friendship patterns. We are investigating the types of friendship patterns which characterize adolescents who later develop a schizophrenic illness, and trying to determine whether process
schizophrenia can be separated from the reactive type by knowledge of these patterns.

Within the sociocultural model we have sought measures of social deviance. Hammer and Salzinger will present a paper discussing some statistical properties of schizophrenic language in an attempt to arrive at a measure of social deviance.

Also, within the framework of the sociocultural model, we have carried out two studies of the relation between social factors and institutionalization. Hammer conducted an investigation of the influence of a mental patient's interpersonal network of family and friends upon time of hospitalization. The study to be presented here by Walton and Bennett, assisted by Nahemow, will concern the role of prior isolation on degree of adjustment to a home for the aged.

The epidemiological model is a supermodel, in which each of the other models is weighted differentially in the importance of its contribution to a given disease. One of our main goals is the ultimate integration of the submodels into a comprehensive picture of the various mental disorders. This is, of course, contingent upon the future refinement of techniques and accumulation of findings under each of the submodels, covering the range described — from neurophysiology to culture.