DOUBLE-NUMBER.

Volume 1. Nos. 1 and 2.

BULLETIN

OF THE

MASSACHUSETTS COMMISSION

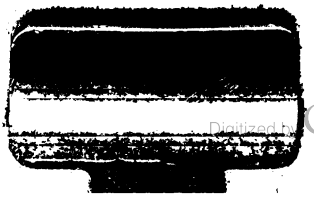
ON

MENTAL DISEASES.

(PUBLISHED QUARTERLY.)

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE, BOSTON, MASS., UNDER ACT OF AUGUST 24, 1912.

BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.
1917.



DOUBLE-NUMBER.
Volume 1. Nos. 1 and 2.

BULLETIN

OF THE

MASSACHUSETTS COMMISSION

ON

MENTAL DISEASES.

(PUBLISHED QUARTERLY.)

EDITED UNDER THE PROVISIONS OF ACTS OF 1909, CHAPTER 504, SECTION 6
BY
WALTER E. FERNALD, M.D.
GEO. M. KLINE, M.D.
E. E. SOUTHARD, M.D.

ENTERED AS SECOND-CLASS MATTER AT THE POST OFFICE, BOSTON, MASS., UNDER ACT OF AUGUST 24, 1912.

BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
32 DERNE STREET.
1917.

PUBLICATION OF THIS DOCUMENT
APPROVED BY THE
SUPERVISOR OF ADMINISTRATION.

BULLETIN OF THE MASSACHUSETTS COMMISSION ON MENTAL DISEASES.

The quarterly bulletin of the Massachusetts Commission on Mental Diseases is intended to embody the scientific and clinical work of the institutions under the supervision of the Commission. The publication of this bulletin is in compliance with the provisions of section 6 of chapter 504 of the Acts of 1909. Under this statute the Commission is required to encourage scientific investigation by the medical staffs of the various institutions under its supervision, as well as to publish from time to time "bulletins and reports of the scientific and clinical work done therein." The systematic publication of such scientific and clinical bulletins and reports may be said to have begun in 1913, with the numbered publications of the Psychopathic Hospital (1913.1–1913.34) and of the State Board of Insanity (1913.1–1913.20). During 1914 the Psychopathic Hospital contributed 29 further publications (1914.1–1914.29) and the State Board of Insanity 14 publications (1914.1–1914.14). During 1915 an important step was taken when, by vote of the State Board of Insanity, the publications of the Psychopathic Hospital, the State Board of Insanity and all the institutions under supervision were grouped and numbered in a single list. The publications of 1915 were 45 in number (1915.1–1915.45). The total number of contributions since a systematic listing was begun is, accordingly, 142. Collections of these contributions have been issued for gratis distribution during the three years in question (1913–15). An endeavor was made to collect reprints from the various journals in which the contributions were originally published and to bind them together for reference. The resulting volumes of collected contributions proved difficult to handle on account of differences in paging, page size, typography and paper quality. The Commission has accordingly determined to issue these collected contributions hereafter in a more uniform manner, and has adopted the plan of issuing a quarterly bulletin, the four numbers of which will to-

gether correspond to the volumes of collected contributions hitherto issued.

The numbering of the contributions will be continued as in the past. As in the past, also, a number of contributions will not be reprinted; for instance, those publications which are extensively circulated by the Massachusetts Committee on Mental Hygiene will not be, as a rule, here reprinted, nor will such publications as are extensively circulated in the transactions of the National Conference of Charities and Correction. Other papers whose nature is merely repetitive of work elsewhere published or to be published in more systematic form will not be here reprinted. However, it is intended that a complete list of publications by institutional officers upon institutional material shall be preserved in the consecutive numbered list of publications, whether these publications are here reprinted or not. From time to time reviews and summaries of work elsewhere will be published. It is the Commission's aim not to omit any matter which will prove of service in the encouragement of scientific work in the institutions, so that reviews and translations will not be out of place. The officers of the State institutions are desired to send for contribution to the quarterly bulletin any material which they may see fit to send, whether it has been published or is to be published elsewhere or not. Within the limits of its appropriation and its judgment as to the value of the contributions the Commission intends to publish in the quarterly bulletin all material in the nature of bulletins and reports of clinical and scientific work done in the institutions that shall serve to encourage scientific work in the institutions. The bulletin therefore includes not merely clinical and laboratory reports and analyses, but also all other material of benefit to mental hygiene, whether mental hygiene be considered in its public and institutional relations, in its relations to the community and society at large, or in its relation to the individual as a personal or medical problem in the narrower sense. The present number contains a portion of the accumulated material accruing from the institutions in the year 1916.

ESTABLISHMENT OF COMMISSION.

In accordance with chapter 285 of the General Acts of 1916, which was passed by the Legislature on June 1, 1916, to take effect on Aug. 1, 1916, the Massachusetts State Board of Insanity was abolished and the Massachusetts Commission on Mental Diseases established.

CHAPTER 285, GENERAL.

AN ACT TO ABOLISH THE STATE BOARD OF INSANITY AND TO ESTABLISH THE MASSACHUSETTS COMMISSION ON MENTAL DISEASES.

Be it enacted, etc., as follows:

SECTION 1. The state board of insanity, existing under authority of chapter eighty-seven of the Revised Laws and acts in amendment thereof and in addition thereto, is hereby abolished. All the rights, powers and duties of said board are hereby transferred to and shall hereafter be vested in and exercised by the commission on mental diseases, established hereunder, which shall in all respects be the lawful successor of said board. Immediately upon the appointment and qualification of said commission and the taking effect of this act under the provisions of section nine, all books, papers, maps, plans, charts, records and all other documents or equipment in the possession of said board shall be delivered to said commission. All the present employees of the board of insanity shall continue to perform their usual duties upon the same terms and conditions unless suspended or removed under the provisions of the civil service rules.

SECTION 2. The commission on mental diseases shall consist of a director, and four associate members, all of whom shall be appointed by the governor, with the advice and consent of the council, — the director, for a term of five years, and the associate members for terms of one, two, three and four years, respectively, from the date of appointment, as the governor shall designate. Thereafter the governor shall annually appoint in like manner, an associate member for a term of four years, and every fifth year, a director; shall fill all vacancies for the unexpired term, and may, for cause and with the consent of the council, remove said members. The director, and at least two of the associate members, shall be physicians and experts in the care and treatment of the insane. The director shall receive such salary, not exceeding seven thousand five hundred dollars, as the governor and council shall determine. The associate members shall serve without compensation, but they, and the director, shall be

reimbursed for expenses necessarily incurred in the performance of their duties.

SECTION 3. The commission shall have general supervision of all public and private institutions and receptacles for insane, feeble-minded or epileptic persons, or for persons addicted to the intemperate use of narcotics or stimulants, except the Norfolk state hospital and the Hospital Cottages for Children at Baldwinsville. When so directed by the governor they may assume and exercise the powers of the board of trustees of any state institution under their supervision in any matter relative to the conduct or management thereof. The commission shall have the same powers relative to state charges in institutions or other places under its supervision, and to their property, as are vested in towns and overseers of the poor in the matter of the support and relief of paupers.

SECTION 4. The director shall be the administrative and executive head of the commission. He shall administer the laws relative to the classes of persons in the institutions under the supervision of the commission, shall prepare rules and regulations for its consideration, shall appoint such agents and subordinate officers as the commission may deem necessary, and shall fix their compensation, subject to the approval of the governor and council.

SECTION 5. The commission shall visit every institution under its supervision at least once a year, and oftener if the governor so directs. It shall ascertain by actual examination and inquiry whether the laws relating to the persons in custody or control therein are properly observed, shall give such directions as will insure correctness in the returns required in respect to such persons, and may use all necessary means to collect all desired information. The commission shall carefully inspect every part of the institution visited with reference to its cleanliness and sanitary condition, the number of patients in seclusion or restraint, the dietary of the patients and any other matters which it may consider material, and shall offer to every patient an opportunity for an interview with its visiting members or agents.

SECTION 6. The commission may annually license any suitable person to establish and maintain a hospital or private house for the care and treatment of the insane, epileptic, feeble-minded, and persons addicted to the intemperate use of narcotics or stimulants, and may at any time revoke the license. No such license shall be granted unless the said commission is satisfied, after investigation, that the person applying therefor is a duly qualified physician, as provided in section thirty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine, and has had practical experience in the care and treatment of such patients. Licenses granted hereunder shall expire with the last day of the calendar year in which they are issued, but may be renewed. The board shall have power to fix reasonable fees for said licenses upon renewals thereof.

SECTION 7. Whoever after the first day of January in the year nineteen hundred and seventeen establishes or maintains such a hospital or private

house, unless duly licensed under authority of this act, shall be guilty of a misdemeanor and shall be punished by a fine of not more than five hundred dollars.

SECTION 8. So much of chapter seven hundred and sixty-two of the acts of the year nineteen hundred and fourteen as is inconsistent herewith is hereby repealed.

SECTION 9. So much of this act as authorizes the appointment of a commission on mental diseases shall take effect upon its passage. The other provisions hereof shall take effect upon the appointment and qualification of the members thereof, but not before the first day of August, nineteen hundred and sixteen. [*Approved June 1, 1916.*

His Excellency Samuel W. McCall, Governor, appointed as members of the Commission George M. Kline, M.D., Director, for a period of five years, John B. Tivnan for a period of four years, Henry M. Pollock, M.D., for a period of three years, Charles G. Dewey, M.D., for a period of two years, and Hon. Elmer A. Stevens for a period of one year.

CONTENTS.

SELECTED MEDICAL AND SCIENTIFIC STUDIES.

UNEMPLOYMENT AND PERSONALITY — A STUDY OF PSYCHOPATHIC CASES.

By Herman M. Adler.

ASSISTANT PROFESSOR OF PSYCHIATRY, HARVARD MEDICAL SCHOOL; FORMERLY CHIEF OF STAFF, BOSTON PSYCHOPATHIC HOSPITAL.

A word of explanation may be required in order to make clear just why an alienist occupies himself with the subject of unemployment.

With the attention at present given this ever-growing problem it is obvious that more than a passing acquaintance with the subject is required for even an intelligent appreciation of its significance. It is not intended that this report be considered an attempt to ascertain the fundamental causes of unemployment, but rather the attempt has been made to analyze in part on the basis of their personality a selected number of persons for whom unemployment was a serious problem. The Boston Psychopathic Hospital, with its annual admission rate of about 2,000, and with 1,500 in the out-patient department, offers an unusual opportunity for studying the extreme cases of social difficulties of many types. Among these, unemployment has appeared not infrequently. It was thought that certain results might be obtained if the careful medical and psychiatric studies of the Psychopathic Hospital patients were made use of in interpreting some of their social difficulties. The difference between studying this sort of material and the much more abundant material obtained in the employment agencies, labor headquarters, court rooms, etc., is that the Psychopathic Hospital patients are subjected to uniform and fairly searching examination, at the completion of which a very fair idea may be had of the physical and mental equipment and shortcomings of the different individuals. This study, therefore, will not lead to an understanding of the economic causes of unemployment, but it is hoped that it will help pave the way to an understanding of the kind of individual who is likely to get into economic

difficulties, the particular kind of difficulty he is likely to meet with, and the sort of situations in which it will be most apt to occur. Furthermore, it must be said that only a part of the patients admitted to the Psychopathic Hospital suffer from mental diseases. A great number of patients are admitted who are suffering from feeble-mindedness, psychoneuroses or border-line conditions. However, all of them show the effects of fairly definite psychopathic tendencies. The study of these extreme types will often show in an exaggerated way, and, therefore, in a way that will impress the observer, difficulties of personality and of career which in a more nearly normal individual might hardly be considered significant.

The work on which the following report is based consisted of an analysis of one hundred cases of unemployment which had been received as patients in the Psychopathic Hospital. These were unselected cases so far as the diagnoses or the nature of the employment difficulties were concerned. The only selection exercised was in regard to age and sex. Only males of from twenty-five to fifty-five years of age were included. These cases were tabulated in the order in which they were received at the hospital. Each patient was subjected to the routine examinations of the Psychopathic Hospital, which consisted in a complete physical examination, a complete mental examination, a psychological examination, with intelligence tests to determine feeble-mindedness, supplemented by a history of social service investigation. The physical examination in each case included a Wassermann test of the blood, and, where that proved positive, lumbar puncture was performed. It was thought that with cases worked up thus thoroughly it might be possible to draw certain correlations with their mental condition and their employment difficulties.

It was not possible in each case to obtain the information with the degree of accuracy and detail that was often desirable; this in spite of the fact that the routine examinations are as thorough as the patient's circumstances will permit and much more thorough than is ever possible in an out-patient service. Perfection in this regard is not only difficult, if not impossible, to obtain, but perhaps even undesirable. There is great danger of amassing evidence to such an extent that one fails to see the wood for the trees. It is to be expected that a survey of one hundred cases, even if it is performed only in the brief fashion here possible, will show certain fundamental correlations. These correlations, while

they may appear to be quite accidental and the result of extraneous circumstances, by their continual recurrence assume a more definite significance. Thus, for instance, one of the first distinctions it is important to make is the distinction between behavior and the reasons given by the participant for his behavior. The legal point of view, which considers every individual responsible for his acts until proven to the contrary, is still dominating our thoughts in regard to social difficulties. Consequently, since a person is responsible, his own account of the reasons why he did a certain thing must be considered of great importance. This point of view is one which is shared also by a number of psychologists and psychiatrists. These belong, on the whole, to the group of introspective psychologists. According to their ideas an individual should always be able to give an account of the reasons for his conduct. He often may not be able to do this without much study or even assistance, but in the end he should arrive at a satisfactory, conscious explanation.

There is a great deal to be said in favor of this view. None the less, it is not the only possible solution, and has one serious disadvantage in its application to such a problem as unemployment in that the time consumed in explaining a single case and bringing into consciousness all the reasons for the conduct disturbance, if it is possible, is prohibitive. At the rate at which the best of the psychoanalysts work it would not be possible properly to study in the course of the year more than a dozen cases. Furthermore, the results of such work are of importance purely for the individual, and no generalizations can be drawn therefrom. Each person's story has to be studied by itself. Therefore, at the end of the year one has an enormous amount of detailed knowledge about a few cases, and all the other cases that might have come before the examiner for attention have to go without any assistance whatever. Also, no generalizations being possible, it is a matter of piece work; to study one hundred cases according to this method would require the efforts of fifteen to twenty psychologists on full time for many months.

It seems clear, therefore, that the only possible way to attack this problem is by the other method, namely, the psychiatric method. This method presupposes that human conduct, like conduct or behavior observed anywhere in the organic world, is dependent upon fundamental reactions. These reactions may be combined into complex forms which may baffle analysis. Above all, one should note that the fundamental concept of organic

activity requires the participation of at least two forces more or less directly opposed. This opposition of forces is continuous or intermittent, and, in perfect repose, is in equilibrium. When the equilibrium is disturbed in one or the other direction, action ensues. Thus, in our muscular system we find muscles that perform opposite functions so placed as to balance each other's pull. A member is flexed, not by the action of the flexor muscles alone, but by the increased tension of the extensor muscles. Both the flexors and the extensors are active, only the flexors are a little more active. Complete relaxation of the muscles occurs only in deepest unconsciousness. In the same way one may assume that the mental activities are more or less in equilibrium, and this applies principally to the instincts and the emotions. The emotions are associated with the conscious mind, but also more fundamentally with other functions of the body, so that an emotion may be evoked by other than psychic disturbance. The mental content will be correctly associated with this, except in complete dementia. Ordinarily, emotional impulses are well correlated with conscious mental processes, so that on the receipt of unpleasant news and in the face of a pleasant experience the corresponding emotions are experienced. On the other hand, emotional impulses may arise from causes outside of the mind, outside even of the subconscious mind in the meaning of the psychoanalytical school. Thus, for instance, one may wake up in the morning feeling depressed. This may be due to purely physical causes and need not be necessarily due to supposed complexes, as Sigmund Freud maintains. The work of Dr. Cannon at the Harvard Medical School on the role of the ductless glands in pain, hunger, fear and rage has shown at least one way in which this may occur. When such an emotional impulse is aroused, the whole human being resists it. He tries to free himself from it as soon as possible, and does so by many devices, such as following his routine occupations, interesting himself in his work, seeking distraction by conversation with interesting, stimulating persons; but, whatever he may do to relieve the emotional tension, he does not allow it to affect his conduct in any serious way. His inhibition, his judgment, whatever it is that he uses, is sufficient to oppose these tendencies up to a certain point. There is, however, a threshold above which he can no longer inhibit. If the stimulus is strong enough, therefore, the individual would not be able to resist. Just where this threshold or this breaking strain lies has to be determined in each individual.

Normal individuals show a certain range of variation in this respect. In fact, a single individual may at different times show a variation, but ordinarily these variations are within comparatively narrow limits, so narrow that it has been possible to construct a huge code of laws which without great injustice fits practically all the normal members of the community. When this threshold varies, however, beyond these limits, then conduct results which is sufficiently outside of the normal limits to call for attention. It is very important, however, to realize that such variations, while they may be fundamental, congenital, and even more or less fixed, are not absolutely fixed and permanent. Were this not so, the problem of dealing with the deviates would be greatly simplified. Then it would be merely a matter of rounding them up and either executing them or at least segregating them. The difficulty in the management of delinquency is caused chiefly by the fact that individuals vary somewhat in their ability to fit into the existing community and that, therefore, an appearance is created that their misdeeds are intentional, and that the best remedy is to teach them the stern lessons of reality by making them suffer for their acts.

This method has failed all along the line, and nowhere more than in the treatment of unemployment. The corrective measures that are applied to cases of unemployment are usually methods of teaching by experience. The individual gets into difficulties and, where the authorities become interested, pains are taken to convince him, in order to prevent their recurrence, that these difficulties are the results of his own ill-judged acts. The recurrences, however, are noted and investigated and attention is gradually withdrawn from the delinquent and efforts are made to prevent his dependents or neighbors from suffering the consequences of the delinquencies. The only art, apparently, that is used in the corrective measures employed consists in tempering the severity of the reactions to the delinquent. So, while on the one hand we say to the individual, "You must not do this again because if you do you will suffer starvation and exposure and perhaps death," at the same time we temper this by preventing his dying of exposure or starvation and even by maintaining the family though inadequately, during his unemployment. Nature's remedy is to let events take their full course and to exterminate the weakling who cannot learn by experience. We have a horror of such methods and object to death as a penalty. We do not, however, sufficiently modify the rest of the treatment to make it very effective.

As a first step, therefore, in determining what could be done in the way of corrective education, it is necessary to determine the exact nature of the individual in question in regard to his ability to learn. To do this we have analyzed one hundred cases in such a way as to group all the patients under three headings. The headings indicate in a very schematic way our opinion as to their character or personality. The first of the three classifications is the *paranoid personality*. Under this heading are grouped all individuals who have shown by their conduct that their reaction to the world is entirely egocentric. No matter what they experience, no matter what they desire, their own ego is in the centre of the plot and dominates everything. This may be associated with a variety of emotional reactions so that the resulting picture is a varied one. It includes individuals who are convinced of their own ability. They are always ready to undertake new schemes, they are usually working for the betterment of the rest of the world and claim all sorts of altruistic motives, and even may be altruistic to some extent, seeking merely the satisfaction of being in the limelight. Or the emotion may be a depressed one and the individuals are contentious, surly, suspicious, claim abuse, ill-treatment, recognize no kindness that is done them, appreciate no favors, etc. This is by far the largest group in our table, comprising forty-three cases, or almost half.

The next largest group, which we call *inadequate personality*, comprises cases which show evidence in their conduct of a lack of judgment, a lack of intelligence. Under this heading are placed all cases which have been shown by the psychological tests to be defective or feeble-minded, or those suffering from a deteriorating disease other than manic-depressive insanity or the paranoid psychoses.

Finally, we have a third group, which we have called the *emotionally unstable group*. Under this heading we have included all the cases that show sufficient mental ability and judgment to satisfy the ordinary demands of life and who have no marked tendency to the egocentric attitude or to enlarge upon their own significance, accomplishments, or the jealousies of others. These include individuals who show excessive emotional reactions, who at times are buoyant beyond all reason, and while in this condition show considerable psychomotor activity. Their minds are very active, they have many new ideas, they have a marvelous imagination, they undertake a dozen different obligations,

none of which they can carry out. They tire of one thing before it is half begun and go rapidly to another. In another mood, the equivalent of a depression, the more pronounced cases may show a slowing up of the mental activity, an interference with thought, a lack of initiative, a tendency to be unhappy, a brooding disposition. This group of individuals also often exhibit violent outbursts of temper. They are extremely irascible, usually on account of some external provocation. The latter may be very slight. The reaction, however, is always extremely violent. Impulsiveness, amounting often to obsession, is frequently found in these cases. Throughout these changes, whether they are hypomaniacal or depressed, they assume an attitude toward the rest of the community which is that of more or less self-effacement and modesty. The normal individual reacts to another in a friendly fashion if he considers him modest. Every politician knows this and uses little tricks in order to show how unassuming and democratic he is. Universally detested, on the other hand, is the person who appears to be conceited and arrogant, who has an idea of self-importance. A behavioristic distinction may roughly be applied to these cases: that the paranoid personality is one with which we may sympathize, but dislike; the emotionally unstable individual, on the other hand, is one that may be extremely annoying to have about, that causes untold trouble, not to say misery, and yet that is very likable.

With this in mind, it is not surprising that the emotionally unstable group contains only 22 cases. The inadequate group, on the other hand, contains 35 cases. The inadequate and paranoid together, therefore, form 78 per cent. of the cases studied. It is not likely that these figures represent the conditions in the community at large, possibly for the reason that in the first place an emotionally unstable individual in the hypomaniacal condition is a very useful citizen and is not likely to get into difficulties unless his trouble becomes more intense. Also, on account of the fact that these people are all very popular, their friends and acquaintances will gather about them in times of need and will by united efforts keep them "on the job." With the paranoid individual this is not so. The paranoid individual gets into difficulties and one is glad to get rid of him, if possible. Where his abilities are such that the employers do not like to let him go, the other employees sooner or later will force them to dismiss him. Furthermore, the paranoid individual will throw up his job on his own accord where there seems no adequate reason for the step.

It is interesting to consider the reasons for the unemployment in our cases. The patient was asked to state his reason for leaving and then the employer, wherever possible, was seen and his statement was taken. While these data have not yet been completely analyzed, the following points have been made. It seems that with the paranoid individuals the reasons stated by the patient are identical with those of the employer 44 times out of 134 cases, or 33 per cent. In the cases grouped under the heading inadequate the patient's and employer's accounts agree 29 times out of 95 cases, or 31 per cent. In the emotionally unstable group the patient's and employer's reasons are the same 18 times out of 49, or 37 per cent., — a percentage slightly higher than in the previous groups.

Our list of cases does not include any very young people. The ages run from twenty-five to fifty-five, and show the largest number in the years between thirty-six and forty-five, as might be expected.

An analysis of the months employed per case shows the following interesting figures: the emotionally unstable group averages fifty months to each job; the inadequate group, twenty-four and seven-tenths months to each job; and the paranoid, twenty and six-tenths months to each job.

The only conclusions that we may allow ourselves at present on the basis of this material are as follows: —

1. There are individuals in the community who for a variety of reasons are not able to regulate their conduct on the basis of experience. One of the difficulties that such individuals get into is unemployment. The results of their unemployment bring hardships on themselves and on their dependents.

2. While some of these individuals show defects of such a severe nature that they may be regarded as hopeless, and therefore can be segregated, there are others in whom the deviation from the normal is not sufficient to make them incapable of supporting themselves at all times, and it is unwise to segregate them and prohibitively expensive.

3. From our analysis it appears that there are two types of individuals that experience these difficulties. One type, which is grouped under the headings of inadequate and paranoid, is afflicted with certain characteristics of personality which are not amenable to treatment. To maintain these people in the community it is necessary to modify the environment so far as possible in order to prevent, in the first place, the calling out of

their peculiar reactions and, furthermore, to prevent their suffering the results of their acts; in other words, to keep a man "on the job" in spite of his personal unpopularity or inadequacy. The other type, grouped under the heading of emotionally unstable, suffers from the results of temperament. These individuals are subject to variations of temperament and the treatment of their unemployment must be guided by a knowledge of their tendencies so that environment on the one hand can be suitably influenced or chosen for them, and that the individuals themselves may be trained to counteract their impulses to some extent.

ON THE APPLICATION OF GRAMMATICAL CATEGORIES TO THE ANALYSIS OF DELUSIONS.*

By E. E. Southard, M.D.

Abstract.

Remarks on Royce's sociological and logical influences. The general nature of Royce's logical seminary; choice of topics. As to the superposition of grammatical upon psychiatric concepts, the reason for choosing delusions. Delusions in the Danvers symptom catalogue and their place in nosological entities. The neglect of delusions by logic and psychology. James's handling of delusions probably oversensationalistic. Probable value of the psychopathological point of view as illustrated in James's later work. Analysis of certain instances of somatic delusion. Analysis of certain instances of environmental and personal delusions. Contrasting results of the somatic and personal group analyses. Anatomical intimations that the frontal lobes are involved more especially in disorder of personality. Function of impression more likely to employ posterior-lying nerve tissue; function of expression, anterior-lying. Two groups of delusions in dementia præcox, one associated with frontal lobe anomalies or lesions, the other with parietal: the latter delusions fantastic. The pragmatic element in most delusions invites comparison with the grammatical categories of the verbs. Delbrück *v.* Wundt re grammar and psychology. Non-identity of these topics. The four fundamental moods (imperative, indicative, subjunctive, optative). Subjunctive the mood of *will*, optative that of *wish*. "Stratified" development of these moods. Their relation to human character types. Relation of grammatical moods to logical modality (necessary, impossible, contingent, possible). Importance of getting a clear conception of beliefs from the point of view of the believer. Category of the voice (active, passive, middle). Situation passive with many hallucinations, perhaps reflexive in the case of *Gedankenlautwerden*. Involvement of the first person. Importance of distinguishing the second from the third person from the patient's point of view. Gender and number of persons involved in a delusional situation. Do essentially tetradic situations occur, at least where the number of persons involved is *manifestly* four? Tense-distinctions. Probability that most moods with special names in different languages fall toward either the subjunctive (*e.g.*, potential, conditional) or the optative (*e.g.*, desiderative, precative, jussive?). Pragmatic delusions as subjunctive "precipitates." Fantastic delusions as optative "precipitates." Summary.

I.

I am peculiarly glad to speak here in honor of Royce. Especially in recent years I have felt, in my professional work as neuropathologist and as psychiatrist, the effects of Royce's teaching, more particularly of his graduate teaching in the logical seminary, which I have followed omitting a few years only since 1897. I well remember when my training with James and Royce was regarded as something of a disability: it was questioned whether a man with philosophical antecedents could do the work of an interne in pathology! Nowadays we have pretty well worked through that period to one of greater tolerance.

* Reprinted from the "Philosophical Review," Vol. XXV, No. 3, May, 1916.

I want to illustrate in this paper a concrete effect of Royce's logical seminary through the employment of its comparative method in a certain special field of psychiatry wherein are to be applied some categories derived from a portion of the science of grammar.

But first a word as to broader effects of Royce's work. I do not speak of his metaphysics, except as it has relation to the social consciousness. My colleague, Richard Cabot, has already to-day spoken of the Royce influence upon himself. In more limited ways, I must own to identical influences, making for a greater interest in social service than is common among physicians. And indeed the sociological influences of Royce have been wide, as may be seen in the chapter "Of Society" [1] in the fourth volume of Merz's "A History of European Thought in the Nineteenth Century," 1914. Therein Merz sets forth how "no subject of philosophical or scientific interest has been more profoundly affected by it [the spirit of comprehension in opposition to that of definition, or as later termed, the "synoptic" tendency] than the study of man in his individual and collective existence." After then speaking of new definitions of the social "Together," of the "social self" as opposed to the subjective, Merz ascribes to Royce "the clearest indication of this doctrine," quoting a passage from the papers of Royce contained in early volumes, 1894–95, of this Review.[2] I have no specialist's command of the history of these developments, but I am sure that the history of Richard Cabot's justly famous campaign for social service could not be written without reference to Royce's work on the social consciousness. And I know personally that hardly a day passes at the Psychopathic Hospital in Boston without concrete exemplification of these interests as opposed to the purely medical.[3]

What I wish here to set forth is a matter of special psychiatric analysis whose scope and shape have been transformed by influences, not so much of a sociological, as of a logical nature, drawn from Royce's seminary. That seminary has dealt with a great variety of topics from a comparative point of view, although the statistical sciences have not been neglected. Such widely contrasting points of view as those of L. J. Henderson (revolving about the considerations of his book on "The Fitness of the Environment" [4]) and those of F. A. Woods (revolving about the considerations of his books on "The Influence of Monarchs [5] and "Is War Diminishing"? [6]) have been brought by their authors in the developmental state to the seminary.

The topics of the seminary over a long period of years have been well-nigh as wide in range as those of, *e.g.*, Wundt's "Logik,"[7] but their choice has not been governed by any principle such as that of Wundt's "Logik" or by any evident principle except that of the needs of a variety of workers who have for a variety of reasons been attracted to the seminary. Accordingly, although the principle of a book like Wundt's majestic volumes on "Logik" is probably to some extent aprioristic, or at any rate governed by still more general metaphysical principles than those which the book itself sets forth, the topics of Professor Royce's seminary have subjected themselves to no special principle; and this despite the fact that the seminary visitors and its moderator have often been tempted into metaphysical digressions. Aside from the personality of the leader, very possibly the effects of the thought of the late Charles S. Peirce and the late Professor William James have been most in evidence; more particularly, perhaps, the effects of Peirce's thought.

II.

My special topic may be described as a *grammar of delusions*, or more exactly as an application of a portion of the logical classifications of grammar (and more especially the grammar of verbs) to a portion of the data of psychiatry, viz., delusions (and more especially certain delusions that I call pragmatic or parapragmatic to distinguish them from fantastic or more purely ideational delusions). The connotation of the term *grammar* is therefore not that of the elementary-and-therefore-simple-and-reliable, which the term receives in, say, Newman's "Grammar of Assent" or Pearson's "Grammar of Science."

My reason for choosing delusions as one member of the comparative system which I proposed to employ as illustrative of the method of Royce's seminary was as follows: First, there was no doubt from an inspection of the records of State hospitals for the insane that delusions or false beliefs of many sorts were among the most frequent of psychopathic phenomena. Secondly, it did not appear that the topic had been taken up seriously either by logic or by psychology.

First, to develop a little farther the frequency of delusions amongst the insane, I may refer to the data of the Danvers (Massachusetts) State Hospital symptom catalogue, unique I believe in its representativeness of routine records of comparatively high standard.[8] Despite the fact that many patients do

not exhibit definite delusions of a nature permitting accurate transcription, yet in some 17,000 cases of all sorts of mental disease examined at the Danvers State Hospital, period of 1879 to 1913,[9] there were certainly no less than 5,000 cases in which the delusions were definite enough to permit being recorded in the case history. No doubt this experience is the prevailing one and no doubt more intensive histories would greatly augment the percentage of cases characterized at one time or other by delusions.

Such figures of course far transcend the numbers of true "paranoiacs" (or even victims of paranoid forms of the dementia præcox of Kraepelin), and I should not wish to be understood to say that in the 5,000 or more Danvers cases delusions formed the head and center of the mental diseases in question.

Yet the number of actual entities (in the medical sense of this term as a kind of collection of symptoms) in which delusions do form a central feature makes a formidable list. I may limit myself to the following actual or possible entities: paranoia, the paranoid form of dementia præcox, and the somewhat closely allied paraphrenia of Kraepelin's recent formulation, the so-called acute alcoholic hallucinosis, or insanity of alcoholic origin, a number of forms of pre-senile psychoses, some forms of senile psychoses, to say nothing of various forms of syphilitic mental disease, as also manic-depressive psychosis, various mild or severe psychopathic conditions not ordinarily considered to amount to frank mental disease, and even such apparently remote entities, or groups of entities, as are found under the caption of epilepsy and feeble-mindedness.

So much will suffice to show the frequency of delusions among psychopaths and the probable magnitude of the problem for the science of psychiatry. I need not here discuss the somewhat large psychiatric literature of delusions. I confess that the literature in question has struck me as a little barren or at best the threshing over of old straw by the application of categories borrowed, *e.g.*, from Herbart or Wundt to material that neither had ever concretely considered.

Secondly, to develop a little farther the logical and psychological neglect of the topic. The logic of fallacies, *e.g.*, in Alfred Sidgwick's excellent work,[10] makes not the slightest draught upon psychiatric data, not merely perhaps because the delusions of the insane are not prominently fallacious (at least some of the most serious and important of insane delusions) but because a

logician would never spontaneously think of going to psychiatry for logical material.

But also and more markedly perhaps, it would be somewhat easy to show that delusions, especially of the insane, have been too largely neglected by the psychologists. Even James, in whose work may be seen remarkable influences of his psychopathological point of view, deals with delusions of the insane in a very few brief pages.[11] For example, he cites insane delusions along with alternating selves and mediumships as a type of abnormal alterations in the self, quoting Ribot upon our personality and Griesinger upon the "doubleness" of self, of the "struggle of the old self against new discordant forms of experience," "the opposition of the conscious me's," etc. Again, James quotes from Krishaber a case of the well-known metaphysical type of delusions with feelings of unreality. In a footnote to his chapter on the perception of things, James quotes a list of certain special delusions given by Clouston, suggesting that in many cases "there are certain theories which the patients invent to account for their abnormal bodily sensations;" "that in other cases they are due to hallucinations of hearing and sight." James here also defines a delusion "as a false opinion about a matter of fact which need not necessarily involve, though it often does involve, false perceptions of sensible things."

How rationalistic, nay sensationalistic, are these latter definitions just quoted from James! The point is urged that the data of reasoning are as it were poisoned at the sensory source. Theories are invented, or hallucinations supply data.

This, as it seems to me, over-rationalistic account of delusions is the more remarkable in James because the whole trend of his thinking was surely bent by his medical or psychopathological point of view. Those of us who have confidence in the psychopathological method may indeed feel that the key to a thoroughgoing theory of belief may be found in a study of delusions, namely, of false beliefs.

I should like to dwell on the James point of view here, because I think his progress subsequent to the "Principles of Psychology" and culminating in "The Varieties of Religious Experience"[12] shows a drawing-away from the sensationalistic point of view to a very overt voluntarism, under which, had James considered the problem of delusions, he might well have dealt with them as perversions of will rather than false conceptions or conceptions based on false perceptions, hallucinations, or strange bodily sensations.

It is difficult not to think that the logical method at the bottom of James's "Varieties of Religious Experience" is not essentially the method of psychopathology despite the careful guarding of the point of view from certain misconstructions in the initial chapter of that work entitled "Religion and Neurology," as when James states concerning the phenomena of religious experience that "When I handle them biologically and psychologically as if they were mere curious facts of individual history, some of you may think it a degradation to so sublime a subject and may even suspect me, until my purpose gets more fully expressed, of deliberately seeking to discredit the religious side of life." James, it will be remembered, furnishes a concrete example in George Fox, pointing out that whereas the Quaker religion, which he founded, is something which it is impossible to overpraise, yet Fox's mind was unsound, and from the point of view of his nervous constitution, he was a psychopath or "detraqué of the deepest dye."

To be sure, we do not need to guard the results of an analysis of insane delusions with such cautious remarks as the above concerning the psychopathic varieties of religious experience. Yet I am inclined to believe that whether or no the point of view of psychopathology is more important than that of the classical psychology in the analysis of belief, at any rate the possible contributions of psychopathology have been singularly neglected.

Accordingly, some years ago I started some superficial and orienting analyses of delusional material,[13] the results of which I wish to present briefly here, partly to show the general nature of the material.

My first systematic work dealt with somatic delusions[14] and the result was decidedly sensationalistic and quite aptly illustrated James's remark above quoted concerning "theories which the patients invent to account for their abnormal bodily sensations." In fact it was only when one passed from somatic to personal and environmental delusions that what I have called the sensationalistic hypotheses seemed to fail.

To quote a portion of the conclusions drawn from the work on somatic delusions, "the concept of the *crystallization of delusions around sensorial data of an abnormal sort* must be entertained for some delusions at least." More in detail, "In one group of cases (Cases I., II., III., possibly VIII.) the psychic rendering of the somatic states is rather critical and temporary, and follows a process somewhat comprehensible to the normal mind. (Type:

'shot by a fellow with a seven-shooter,' in a *spot found to correspond with a patch of dry pleurisy.)"*

"In others (Cases IV., V.) the psychic rendering is less natural and is more a genuine transformation of the sensorial data into ideas quite new. (Type: *'bees in the skull'* found in the case with cranial osteomalacia.)"

"In others (Cases VI., VII.) the problem is raised whether severe hypochondria, with ideas concerning dead entrails and the like, may not often indicate such severe somatic disease as tuberculosis. The psychic rendering here is of a more general (apperceptive?) sort."

A somewhat generalized account of this conception was presented in more popular form by my friend Dr. Franz in the "Popular Science Monthly".[15]

A second paper on environmental (or, as I called them following Wernicke, allopsychic) delusions[16] yielded the in one sense negative result that environmental delusions seemed to trace back in most instances to temporally or logically prior disorder of personality. I raised then the question whether delusions often spread inwards (egocentripetally) or habitually outwards (egocentrifugally), a concept later to be illuminated by the concept of the voice (active, passive, or reflexive) in which the patients habitually or characteristically moved.

I found that, to quote a later paper on delusions of personality,[17] "put briefly, the deluded patient is more apt to divine correctly the diseases of his body than his devilments by society." Or more in detail "these delusions having a social content pointed far more often inwards at the personality of the patient than outwards at the conditions of the world. And case after case, having apparently an almost pure display of environmental delusions, turned out to possess most obvious defects of intellect or of temperament which would forbid their owners to react properly to the most favorable of environments. Hence, we believe, it may be generally stated that the clinician is far less likely to get valuable points as to the social exteriors of his patients from the contents of their social delusions than he proved to be able to get when reasoning from somatic delusions to somatic interiors."

A word is perhaps necessary to guard against too sweeping conclusions. "In a few cases it seemed that something like a close correlation did exist between such allopsychic delusions and the conditions which had surrounded the patient — the delu-

sory fears of insane merchants ran on commercial ruin, and certain women dealt in their delusions largely with domestic *debâcles*. But, on the whole, we could *not* say that, as the somatic delusions seemed to grow out of and somewhat fairly represent the conditions of the soma, so the environmental delusions would appear to grow out of or fairly represent the environment."

I need quote from only one more paper on the delusion question. The papers above mentioned deal chiefly with cases whose brains looked normal to the naked eye, the material having been chosen as nearest to normal. In another study I deliberately took up perhaps the most abnormal material that we possess in psychiatry, namely, subjects of general paresis,[18] a disease now regarded as a form of brain syphilis. Incidentally I found that the somatic delusions, despite the grave brain damage of paresis, tended to show somatic sources, precisely as had the normal-brain material. When it came to allopsychic (environmental) and autopsychic (personal) delusions, it appeared that these delusions were statistically associated with lesions of the frontal lobes, and that cases without frontal emphasis of lesions were not at all apt to be delusional or, for that matter, to be specially subject to grave disorder of personality.

Now it might not be at once obvious to those who have not followed the progress of brain physiology whither these frontal lobe findings would speculatively lead. I shall develop the matter merely to the point of justifying the choice of the grammar of verbs rather than that of nouns for comparative purposes (I bear in mind that I have not yet justified the choice of grammar at all for such purposes).

There has been, ever since the discovery attributed to Charles Bell of the different functions of the posterior and anterior spinal nerve roots, a growing mass of data concerning the posterior situation of the sensory arrival-platforms (a term of F. W. Mott) and the anterior situation of the motor departure-platforms. The evolutionary complications of the bulb and indeed of the whole rhombencephalon and of the isthmus cerebri did not succeed in abolishing this general tendency to the posterior situation of the sensory arrangements, despite their sidewise pushing in certain regions.

The posterior-lying cerebellum is regarded as a sensory organ despite its indirect chief function of modifying muscular activity in certain ways. Then the physiologists found a variety of sensory spheres more posteriorly lying in the cerebrum. Sher-

rington found that the fissure of Rolando had tissue behind it that must be regarded as receptive in nature and tissue forward of it that must be regarded as motor. Moreover, different parts of the precentral gyrus serving face, arm, and leg were found to lie immediately adjacent to receptive tissues for the selfsame structures lying back of the Rolandic fissure in the postcentral gyrus.

Accordingly it appeared that the nerve tissues exhibit a somewhat general law to the effect that the function of impression is likely to employ posterior-lying tissues, whereas, anterior-lying tissues are likely to be related with the function of expression, and this law is likely to find expression not alone in the simple spinal cord but also in the complicated cerebral cortex.

If it were permissible to draw psychological conclusions from this law as applied to the cerebral cortex, it might be plausibly mentioned that consciousness, in so far as it is cognitive, whether those cognitions are visual, auditory, or kinæsthetic, is rather more likely to employ posterior-lying tissues than anterior-lying ones in the cortex. Campbell,[19] indeed, gave utterance to the suspicion that consciousness is a function of the posterior association center of Flechsig. I am personally inclined to this view.

It is clear then that to find delusions related to frontal lobe disorder, *i.e.*, to disorder of forward-lying tissues was at first surprising. Delusions or false beliefs have the ring of consciousness, of cognition, of ideas. The falsity of these ideas is somehow taken as residing in the ideas; at least that is the tendency of the analyst. Hence, if one were seeking cortical correlations for false beliefs taken as ideas essentially and intrinsically false, one would be apt to turn forthwith, not to the *frontal* lobes, but say to the parietal lobes.

Surprises in the nature of results diametrically opposed to expectation are somewhat frequent in neurology as elsewhere. I had been astonished to find, in the obscure quasi-functional but probably in some sense "organic" disease dementia præcox, that the symptom katatonia, a highly motor-looking symptom, tended to associate itself with posterior-lying tissues.[20] In the same disease, delusions tended to relate themselves with frontal lobe lesions. Not only were delusions found to be based as a rule on frontal disease and katatonic symptoms on parietal lobe disease, but an equally strong correlation was found between auditory hallucinations and disease of the temporal lobe. Of course the

correlation between auditory hallucinations and lesions of the temporal lobes might be *à priori* expected, but the writer at least did not suspect beforehand the possibility of any relation between katatonia (a condition in which hypertensive states of the muscles occur, sometimes amounting to actual *flexibilitas cerea* and catalepsy) and disease of the parietal region. In point of fact, the strikingly cataleptic cases of my series seemed to be often associated with gross lesions of the post-central gyrus, thus giving rise to a suspicion that the condition katatonia or catalepsy is actually due to a disorder of kinæsthesia, or at all events of the tissues which are in some sense the seat of kinæsthesia. This, then, is an example of one of the perennial surprises of observation. An apparent disorder of motion seems to resolve itself into an actual disorder on the afferent side.

Equally surprising in an opposite direction was the correlation of delusion formation with disease of the frontal lobes. As elsewhere stated in this paper, a rationalistic or sensationalistic account of delusions would naturally lead us to think of brain disorder in the sensorium. In point of fact, the parts of the brain which are best entitled to the name sensorium seem to be free of gross lesions and anomaly except in a comparatively small hyperphantasia group. To quote from conclusions of a paper on dementia præcox, "The non-frontal group of delusion-formations the writer wishes to group provisionally under the term *hyperphantasia*, emphasizing the overimagination or perverted imagination of these cases, the frequent lack of any appropriate conduct-disorder in the patients harboring such delusions and the *à priori* likelihood that these cases should turn out to have posterior-association-center disease rather than disease of the anterior association-center. This anatomical correlation is in fact the one observed."

To sum up the argument to this point, delusions of the insane have been chosen for comparative study because of their frequency as symptoms and their centrality in many important mental diseases. Furthermore, because of their neglect by logic and by psychology. There is, however, a likelihood that psychopathological methods will aid both logic and psychology. Somatic delusions do, it is true, afford some basis for a sensationalistic theory of delusions and indirectly of belief in general. But delusions affecting personality are perhaps better regarded as will-disorders or disorders of expression. At any rate, the writer's views were governed by his anatomical results in general paresis

and in dementia præcox, which seemed to show that the majority of delusions were related to frontal lobe disorder. On general grounds the frontal lobes seem to the writer to be best regarded as organs for the elaboration of motion (including attitude, conduct and the like). Of course the existence of essensentially ideational delusions, here called fantastic, must be conceded: these beliefs are as it were *prima facie* delusions and do not require individual and specific testing in experience to determine their falsity. Such delusions were found in one disease (dementia præcox) related with parietal lobe anomalies or other lesions. However, the accuracy of the anatomical observations and their future confirmation are not essential to the argument. Nor is it necessary to consider the parietal lobes as an expanded and elaborated sensorium and the frontal lobes as an expanded and elaborated motorium in following these contentions. In point of fact, the pragmatic element in many or in all delusions is perhaps obvious to inspection, and the existence of a fantastic group of delusions, not requiring much pragmatic testing, is not unlikely on general grounds.

Assuming, then, for the moment that the value of comparing the categories of grammar with those of psychiatry is conceded and that delusions have been chosen for a test of such comparisons, it become obvious that the strong motor, expressive, pragmatic element in delusions immediately invites comparison with the categories of the verbs.

III.

I am so ignorant of the theory of grammar that the present section of my paper must be very brief. At the outset I must perhaps say that the value of comparing categories of two sets of scientific data would be much diminished if those data happened to have been analyzed by the same group of men or under the same dominant logical interest. Had the theory of speech-function, language, grammar, and cognate materials been elaborated by the same technique as the materials of psychiatry, then the chances are that the comparisons here intended would be of lesser value. Luckily for these purposes, unfortunately perhaps for others, it would appear that the psychology which dominates philology and comparative grammar is not especially modern, and is indeed Herbartian. On the other hand, the development of aphasia doctrines and cognate matters in psychiatry has not considered to any extent the developments of philology, com-

parative grammar, or even the anthropology that has grown hand and hand with linguistics.

The ideas of Delbrück [21] about grammar and the ideas of Wundt about speech have undergone insulated courses. Steinthal and Paul seem to have been Herbartians, and Delbrück seems to have followed them. After Wundt's publication of large volumes on "Sprache," [22] Delbrück brought out a little book of critique,[23] regarding many of the Wundtian contentions about speech as unwarrantable applications of personal and unproved psychology. Wundt replied in another small book.[24] There was no sign of unanimity.

For our purposes this situation is on the whole advantageous, since we can trust the categorization of grammar to have proceeded without immediate and constant overhauling in the progress of psychology. Humboldt, Jones, Bopp, Grimm, Pott, Binfey, Schleicher, Brugmann, Whitney, and Delbrück himself are names of men hardly touched by psychology or logic. In fact the *Junggrammatiker* with their suspicion of metaphors in the whole range of their science would probably look on an incursion of psychology into philology as a genuine raid. They would probably recall with heart-sinking older efforts at a universal grammar, at a "metaphysics of language"! There might indeed be a suspicion that somehow the psychological raiders were going insidiously to introduce still more deadly poisons into the already defiled wells of grammar than the "bow-wow" or "pooh-pooh" theories.

The present plan is more modest. Probably the streams of logic now current in linguistics and psychology parted as long ago as Kant. The categories of neither science have had much effect upon the other. Occasional references are made by expounders of the one science to the injurious effects of a possible resort to the other. Probably a "nerve-brain" theory of linguistics would be regarded by philologists as hardly a degree removed from dangerous metaphors derived from "natural" sciences, of which examples are cited especially against Schleicher. Giles says,[25] *e.g.*: "Schleicher and his followers in the middle of the nineteenth century had taken a keen interest in the development of the natural sciences, and had to some extent assimilated their terminology to that employed in those sciences. It was, however, soon recognized that the laws of language and those of natural science were not really alike or akin." Thus, by appeal to higher authority, are guarded the preserves of special theory.

However, on the other hand, in discussing these considerations with psychologists and philosophers, I find signs of an opposite tendency. A friendly critic remarked that he had always supposed that psychiatry and psychology could derive much aid from linguistics, in view of the obvious fact that thought and language are so largely identical in mechanism. This contention was that in studying linguistics one is studying a branch of psychology and that in studying psychology one is nowhere or almost nowhere free from speech analogues. And, in the same direction, one is aware how much of the development of brain-localization theory in psychiatry is built up on analogies to the conditions prevailing in aphasia. The psychiatrist would here recall the efforts of the Wernicke school,[26] beginning with sensory aphasia and culminating in apraxia.

As against such contentions I find numerous objections to the employment of linguistic theory in the elaboration of logical and psychological doctrine. The logicians in especial seem aggrieved at the perverted usage of sentence-structure in syllogistic theory and are constantly calling attention to the pitfalls of language in respect to logic. Charles Peirce remarks [27] how much the logician Sigwart seems to depend on the expression of immediate feeling as logical, and how Sigwart considers language and especially the German language as the best vehicle of logic. It will be recalled how much attention is paid to "substantive" and "adjective" ideas in some of James's chapters. The reaction of most readers to the idea of "but" or of "if" runs, I suppose, to the effect that something figurative probably lies at the bottom of the linguistic analogy.[28]

We are often warned both by grammarians [29] and by psychologists not to trust overmuch to the situation depicted in Indo-European comparative grammar, *e.g.*, in the work of Berthold, Brugmann and Delbrück. Thus the principles of the isolating Chinese, the agglutinating Turkish, the polysynthetic North American Indian languages are said to be impossible of establishment by means of terms borrowed from the Indo-European grammar.

Upon a superficial inspection of grammar we chose to believe that something of value to the theory of delusions, at all events to their nomenclature, could be obtained by a study of the theory of verbs in grammar. If the polysynthetic languages have no verbs, it is nevertheless undeniable that action is expressed by North American Indians. If incorporated languages often

insert the object in the verb, yet at any rate the Basques are able to express action. If the Semitic verb has no tenses and merely expresses relations, yet at any rate there is a concept tense, which concept could be expressed by Semitic speakers. These examples suffice to hint at the great extent of the field of comparison.

I choose to study the grammar of verbs for the purpose of getting light on delusions or beliefs involving action. Much will be to the purpose, much not. In any event the grammatical nomenclature will not have been built up by psychologists or psychiatrists. We shall not identify grammar and psychology: we shall merely hunt for identities and analogies.

There is some indication that in Indo-European grammar there are four fundamental moods, imperative, indicative, subjunctive, optative. A discussion like that in Goodwin's *Greek Moods and Tenses* [30] exhibits some of the ingenious and appealing problems of these moods. Probably the germ of my desire to approach the present considerations was got from casual reading of the discussion by Goodwin of Delbrück's contentions concerning the subjunctive as a mood of *will* and the optative as a mood of *wish*.

The simplest verb forms seem to be the imperatives, bare stems as a rule. How readily these could be derived from cries, simple vowel calling, or at any rate simple articulations, early in man's development, can be readily imagined. The early world of the savage and the babe gets on to a considerable range of power with imperatives and the kindred vocatives.

Indicatives may then develop or, if not temporally prior to the subjunctives and optatives in verb-form development (and I suppose there are not enough comparative data from different linguistic groups to permit a general answer to such questions), then in any event logically prior. The world of language is full of statements, true or false, affirmative or interrogatory.

Figuratively presented the linguistic verb stratum of imperatives is spread over with a layer of indicatives, which the increasing tranquility of life permits and produces. Imperatives and vocatives are less necessary, less polite, less useful, since past and future facts can now be held and turned over in the mind.

Gradually there may develop at the two poles of the language structure the moods of will and wish, to use Delbrück's terms. The development *might* of course be that, as a result of the operation of the fancy, the layer of the indicatives should be

overlaid by a stratum of optatives, to which a number of *false* indicative statements might have made a convenient transition. Then further the layer of wishes *might* be topped with the layer of subjunctives, *i.e.*, of hypotheses, conditions, probabilities, and the like.

As we see men and women, however, I am inclined, for the present at least, to hold to the notion that the subjunctive and optative developments (of course always as mental reactions, *not* as verb-forms necessarily) take place rather independently. To be sure, the absolute deliverances of the *Utinam! Would that!* optative type do surely resemble imperatives rather than indicatives. And the more complicated machinery of a sentence containing a subjunctive immediately suggests the regularity and finish of the indicative. Both the subjunctive and the optative, however, have a derivative appearance and suggest the necessity of indicatives as at any rate logically prior to their formation. Hence, as above stated, I prefer to see the optatives and subjunctives rising as it were as separate eminences from the plateau of indicatives, and this despite the fact that special pipes may lead from the underlying imperatives to the moods of wish.

Perhaps I should here insist that the point of such a metaphorical account of a certain aspect of verb-forms is not at all to offend any modern representatives of the *Junggrammatiker.* Above all, such an account has nothing historical or glottogonic about it. The point, if well taken, is logical not historical.

The student of human character and especially the alienist is at once aware that this fourfold division of moods (imperative, indicative, subjunctive, optative) fairly well corresponds with human character groups. Especially is this true of the subjunctive-optative contrast.

Who cannot see the scientific man as a man of hypotheses and probabilities, viz. of subjunctives, and the artistic man as a man of wishes and fancies, viz., of optatives? "If me no ifs," impatiently cries the poet to the man of science. "The wish is father to the thought," sadly or crabbedly the scientific man replies.

Such reflections as these, rather than genetic linguistic considerations, suggested the comparisons of the present paper.

More or less instructive comparisons between these fundamental moods and the classical temperaments might be made: thus, choleric, imperative; phlegmatic, indicative; melancholic, subjunctive; sanguine, optative. Probably the choleric and sanguine temperaments suit the imperative and optative moods

more perfectly than do the others. There remains, however, something apposite in them all. It would not be difficult to show similar analogies between these four moods and the character types of Malapert, for example.

To sum up, at this point, after stating in Section I the *raison d'être* of these comparisons, the general reasons for choosing delusions as the *comparand* were stated in Section II, at the end of which section it was stated that the grammatical *comparator* must be from the region of the verbs. Section II had called attention to the pragmatic element in the majority of delusions, throwing this element into contrast with the ideational one. Some special reasons from brain physiology and from the writer's anatomical studies were adduced in explanation of the pragmatic element in delusions. These physiological and anatomical notions were not essential to the logical argument. But the fact that somatic delusions seemed to crystallize about sensorial data (and were consequently rather more of the nature of illusions) and the fact that there seems also to be a second group of fantastic delusions (also more of a sensory nature and as it were illusions of memory and overplay of imagination) are two facts that tend, by the relative infrequency of their appearance, to emphasize the fundamental importance of the pragmatic element in most delusions. Most delusions are not *prima facie* false beliefs, but require the test of time and experience to prove their nature. This is but another way of stating their pragmatic or at any rate their motor and expressive, character.

In Section III, a brief sketch has been offered of the situation in grammatical science, which seems to have developed along a path separate from that of the mental sciences, such as logic, psychology, psychiatry. The categories, nomenclature, and classification of grammar have therefore a certain independence from those of the mental sciences. Delbrück and Wundt do not gibe exactly. The section is finished by a brief statement as to the four moods (imperative, indicative, subjunctive, optative), which Indo-European grammar has shown to be fundamental. A figure of speech recalling the strata of geology is offered wherein the earliest practical situation in the development language is depicted as a layer of imperatives, next a layer of indicatives, and thereupon the subjunctives and optatives. Possibly these latter have a certain independence of development and spring from different parts of the plateau. The optative or mood of wish may possibly derive more particularly from the imperatives.

The next section will take up in order the most striking features in the categorization of the verbs which seem to be applicable to delusions.

IV.

Dismissing discussion as to choice of delusions as an object of comparison, and assuming that the pragmatic element in delusions is strong enough to suggest comparison with the most active and motor categories of grammar, I had proceeded in Section III. to point out the independent development of the mental sciences on the one hand and grammatical science on the other and to indicate in the briefest manner the characterological interest of the grammatical moods.

In the present section, I propose to rehearse some categories of the grammar of verbs that seem to me of theoretical and even of some practical value in the analysis of delusions. It is unnecessary to insist that the impetus to such comparisons is logical rather than psychological. It is not that thought and speech, pragmatic beliefs and grammatical moods, delusions and modal over-use or perversion, have developed *pari passu*. They may have developed *pari passu*, and speech may be as central in thought as aphasia is in the Wernickean psychiatry; but, if so, the point and origin of these comparisons did not lie in that identity.

Are there not logical categories ready to hand which are superior to any that may have developed in grammar? Notable is the fact that many logicians strongly condemn the grammatical infection of logical processes and the allied situation presented by the necessity of describing many logical processes in words. But, aside from the verbalism of much logic, let us consider a moment the logical modalities in comparison with the grammatical moods (or, perhaps better, modes).

There is a certain relation between the modalities of logic [27] and the so-called modes or moods of grammar. The distinctions of *possible*, *impossible*, *contingent*, and *necessary* are of obvious value in describing a variety of situations. In describing the actual facts that correspond to beliefs and delusions, these modalities are most exact. Or, if the "actual facts" are not to be obtained, these modalities are of the greatest service in denoting what A thinks about B's statements, *e.g.*, what the alienist thinks is the truth about his patient's delusions. These modalities are of value in objective description. It is even possible to point out the vicinity of the concept *contingent* to

the concept *subjunctive*, of the concept *possible* to the concept *optative*. It could almost be said that the *necessary* is not far from *imperative*. This would leave us with the *impossible* to correspond with the *indicative*, and perhaps, with the idea of Charles Peirce concerning the range of ignorance as corresponding with that of knowledge, some argument could be made even for the vicinity of the concept *impossible* to that of the *indicative*. In any case the *impossible* is well known not to be the opposite of the *possible*.

It must be clear from the comparisons here sketched that the classical modalities, *possible, impossible, contingent, necessary*, are of little immediate classificatory service for delusions or even for beliefs. Neither is there enough known offhand about any situation to make sure of affixing the proper modal description to the said situation, nor can the contentions of the believer or the paranoiac be subjected to experimental tests for the same purpose.

Accordingly, though the modalities of logic may be far more accurate and more representative of species of truth than the grammatical moods, yet the grammatical moods will perhaps prove more useful in immediate descriptions of belief-situations *from the point of view of the believer, e.g.*, of the deluded patient.

What we have long wanted in psychiatry is some way of getting at the psychic interiors of our patients. It is a safe injunction to hold fast from the first to the patient's point of view. The familiar Freudian distinction of manifest and latent [31] contents looks in this direction. But, omitting altogether at first any alienists' constructions as to latent contents, the examiner who adheres overtly to what is manifest in his patient's story is too apt, according to my experience, to fail to distinguish between what is true to the patient and what is true to the alienist. Let us distinguish what is *latent* in the patient from what is *manifest* in the patient. But let us distinguish between what is manifest to us *in* the patient from what is (to the best of our belief) manifest *to* the patient. Identical precautions are surely observable not only for patients but in the evaluation of all sorts of direct evidence.

One of the most valuable of the grammatical categories under which to consider a delusional situation or any belief-situation in which the believer attributes a change in the universe is the category of the *voice*. Again it is important to distinguish the actual situation as the examiner views it from the situation as

the patient or witness views it. We stick to the latter. Does the patient view himself as in the active voice, or in the passive voice, or perhaps in the middle (reflexive) voice? The question cannot often safely be asked in so simple a form. But it is as a rule singularly easy in a few questions to elicit from a deluded patient what he believes as to his own passivity or activity in the situation as he conceives it to be altered.

Perfectly simple is the felt passivity in certain victims of hallucination. The patients are here as passive as any recipients of sensation, and the whole reaction may be one of fixation or fascination *prima facie* passive. On the other hand, in cases of so-called *Gedankenlautwerden*,[32] the insistence of the hallucinatory or quasi-hallucinatory voices may be as intense, but is not necessarily one of felt passivity. The patient may be best described as in the middle voice: his conscience is at work, the still small voice is no longer small or still, he himself is somehow the source of his difficulty. Further reasoning may discover additional non-personal reasons or ancient active sins that are conceived by the patient to be actually responsible for the trouble. But this further reasoning is not necessarily faulty or in any sense delusional and may even be as objective as the alienist's own analysis. Indeed the patient may reason from manifest to latent as skilfully as the alienist or may even mislead the alienist by means of constructive or over-evaluated happenings of the past, which may then be taken falsely as actual objective happenings. And such constructions or distorted facts may prove new *points d'appui* for false beliefs. But the fact that this merry logical dance may be led both by patient and by examiner is not here in question. The point I am endeavoring to make is that the voice in which the patient's situation (to our best belief as to the patient's own point of view) can best be expressed is an important category of classification. Several alienists to whom I have submitted the point are in entire agreement with me and regard the felt or conceived activity, passivity, or reflexivity of the patient as a surprisingly comprehensive characterization for the total situations presented by many deluded patients. That is to say, though it might be thought *à priori* that a given patient would rapidly shift in his deluded state from active to passive to reflexive (and permutably), yet the facts are commonly against these rapid shiftings of the felt "voice." Of course the phases do not always take so long in the evolution as in Magnan's *délire à evolution systematisée*,[33] now presented by Kraepelin in

slightly modified form as *paraphrenia systematica.*[34] I shall not here enter special psychiatric questions; but limit myself to saying that in practice a given delusional phase in a patient is commonly well enough characterizable in a word as active (*e.g.*, certain states of delusional grandeur), as passive (*e.g.*, certain states of delusional persecution), or as reflexive (*e.g.*, certain states of self-accusation). The terms are good brief accounts of what I more cumbrously designated formerly [17] in such terms as "ego-centrifugal," "egocentripetal," "spreading outwards," "spreading inwards," and the like. Only the term reflexive is not so familiar and may need replacement with hyphenates of the term "self," or even with "solipsistic," "egoistic," though these latter terms are often too active in their denotation.

The fact that a situation may be described with correct grammar either in the active or in the passive voice need not trouble our analysis. So also can delusions. The point is not to identify grammatical voice with a type of delusional situation, but to borrow from grammatical categories a classification suitable for delusional situations.

Nor need a fact such as that in certain Indo-European developments the passive verb-*form* grew out of the reflexive verb-*form* be taken as of more than suggestive value. That fact might or might not be of telling value in such an analysis as ours.

Central in our considerations of the believer's active, reflexive, or passive voice is clearly the personality of the believer. We are thus naturally led to the possible comparative or suggestive values of the grammatical person. The grammatical concept, and the common sense concept of person are to some extent obviously identical. The vast majority, if not the entire group, of psychopathic delusions may be said to revolve about the first person. The concept of the first person (singular) together with that of the voice synthesize to a concept which makes a fairly complete characterization of at least the majority of delusions. Delusions of grandeur as a rule readily reduce to the active voice and the first person singular: the predicate situations are often numerous and mutable. Delusions of persecution reduce as readily to the first person in the passive voice. Reflexive is the situation of the first person in delusions of self-accusation. Much of psychiatric interest doubtless awaits a grouping of other sorts of delusions even with so slight a logical armamentarium as this.

The second person is often involved in delusions. If we adhere to a projection of the delusional universe always from the pa-

tient's point of view, it must be clear how important is a distinction of second and third person. Taken from the psychiatrist's point of view, the *dramatis personæ* may well all seem to be in the third person, except perhaps the patient with whom the psychiatrist may feel like starting a small new drama of their dual own. But, if we adhere as ever to a construction from the patient's point of view, the difference between the *you* of the patient's plight and the *he* or the *she* may be decisive. Thus in minds working more or less on normal lines, it is hard to conceive homicidal ideas directed at a *him* or a *her*. The threats must far more often lodge with a *you*. On behalf of some *you* the patient might conceivably try to do to death a somewhat otherwise uninteresting *him* or *her*. But the majority of delusional situations are doubtless far more apt to be egocentric.

It may prove of special interest whether hallucinations of hearing come from a conceived *you* (as in a conversation or a monologue) or from a conceived *him* or *her*. There must be far greater intensity and dramatic quality about the statements of some *you* than from a third person.

It is entirely feasible to construct the situation of these other persons from the standpoint of grammatical voice. This has recently arisen in some cases that have come to my attention of *folie à deux*, in which the so-called "active" and "passive" persons may need separate analysis. And, in situations far less psychopathic, the psychiatrist has often to execute an about-face of this sort to get at the reactions of the grieved or angry husband or wife.

I have had to mention gender in the previous paragraphs. Krafft-Ebing and Freud have sufficiently called the world's attention to the sexual situations that occur in or make for psychopathies of various sorts. The routine collector of delusional elements must however bear in mind the necessity of establishing the sex of all the *dramatis personæ*, whether for the purpose of establishing or destroying some of the more recondite Freudian hypotheses or for the more modest purpose of banal social adjustments.

The value of the number of persons is not quite so obvious. How many persons are involved in the universe of belief or of delusion? Of course the scene may be peopled with any number of persons all acting normally even from the patient's point of view. But how many are acting abnormally either as sources of effect upon the patient, or as the objects of his action or perhaps

as the instruments of his action? Are there perhaps some who may be fused and are working as a collective unit (the family, union-members, etc.) from the patient's point of view? Perhaps here is the weakest point in the routine analysis of delusional situations. The number of persons may be one, two, three, several, many, almost everybody, everybody, indeterminate, etc.; but all that can be collected concerning the number (and obviously the sex) of the persons involved, so far as the patient conceives them to be acting or suffering abnormally, will be found of the greatest value in analysis. Increase or reduction in the catalogue of intra-delusional persons may prove of value in prognosis. I should not need to insist on a special record of persons remaining extra-delusional, *i.e.*, excluded from the universe of the patient's altered world, when by all signs such persons would naturally be involved.

Most delusions of the lucid group which we can hope to analyze represent situations at least dyadic from the standpoint of the objective examiner. They are often triadic, *e.g.*, delusions of jealousy. But it must not be forgotten that a dyadic situation may conceivably be monadic from the point of view of the patient, as when he conceives that the altered attitude of a relative is not really injurious. But obviously enough there remains the suspicion that the situation, even from the patient's point of view, is effectively dyadic. Again delusions of jealousy may masquerade as dyadic.

Whether there is any important group of essentially tetradic delusional situations is worth inquiry. Among fictional situations as depicted by novelists, the tetradic situation with double shifting of courtiers is not unusual, though it may well be a more symmetrical situation than the world itself is apt to show. So far, I have not found many good instances of essentially tetradic delusional situations, *i.e.*, when the elements are persons. In numerous instances where four persons are involved, the fourth turns out merely ancillary to the third and to disappear, as it were, by the identity of indiscernibles. But this needs much concrete case analysis.

The important tense-distinctions of verb-forms recall the importance of the time element in delusions. Some of Delbrück's designations for general time relations of action are suggestive, *e.g.*, iterative, frequentative. Terminative actions, those conceived to have a beginning, an ending, or both, suggest obvious distinctions as to conceived delusional situations. Of course the

stock case-history should and often does contain a sufficient account of these matters, as the term *history* insists. Still, I fear that we do not always keep separate in mind the objective anamnesis (to use a frequent medical term) and the anamnesis or catamnesis as the patient describes it and believes it to have occurred. Thus the one noxious event in the whole history may have occurred as it were aoristically at a special moment or brief period, and the rest of the history may seem to the patient an entirely natural train of consequences. In the direct or indirect psychotherapy, so apt to be employed in all sorts of not-yet-defined delusions, quite a different technique might need to be employed for the delusional universe with an aoristic event long past than for a universe with iterative factors or with "present perfect" characters, etc.

I arrive once more at the perhaps central topic of the moods. At the conclusion of the last section I spoke of the major distinctions as to moods, so far as the most thoroughly studied Indo-European grammar is concerned. I shall not in this paper deal intimately with the topic, as I conceive that much more case analysis should be available than I have as yet looked over.

But I wish to call attention to the vast wealth of special designations of moods which are found in the gradually increasing group of languages now being brought under scientific study. Most of these moods appear to me to fall rather readily into one or other of the subjunctive and optative groups. Thus the *conditional* certainly belongs with the subjunctives, and might perhaps be thought to offer a better general designation for the group. So too the *potential*. But *desiderative, precative, jussive,* probably belong with the optatives. As to the verb-forms and their special origin and appearance, the logician can have little to say. The point is, rather, that, if a verb-form exists to which a special name has been given, then at least some special shade of meaning has been thought to exist by the grammatical analyst. This shade of meaning probably expresses some rather concrete belief of *intra vitam* origin, not cooked up for a special purpose or at least for any psychiatric purpose.

I have more or less in hand a collection of these mood names from different grammars, of which a set probably large enough for these purposes is in existence at the Boston Public Library. The publication of the British and Foreign Bible Society [35] gives a convenient large list of languages, those in fact into which the Bible has been translated.

I hope to show, but will shortly dismiss here, the possibility that the transformation of "subjunctive" beliefs into "indicative" ones means paranoia of a pragmatic sort, whereas an identical transformation of "optative" beliefs leads to delusions of the fantastic sort. "Transformation" may be better rendered figuratively by such terms as degeneration, collapse, crystallization, condensation, degradation, etc.

V.

The object of this paper has been to illustrate the method of Royce's logical seminary at Harvard. No attempt has been made to describe the method, which is comparative rather than observational or statistical.[36] When the logician superposes the categories of Science A upon the material of Science B, or compares the categories of both, he is not at all sure of important results. If he obtains too extensive or too numerous identities by means of his comparisons, he may be compelled to decide that identity of categories means actual unity of materials. Thus, in the present instance, the reader may be the more ready to swallow the identity of certain categories in grammar and psychopathology, simply because he fundamentally believes in a larger degree of identity of speech and thought. In the event of such a nominalistic view as that, the only merit of the present essay would consist in spreading a sound method over new materials of the same sort; the method would not then be comparative in a very rich sense of the term. But, even if speech and thought are as closely allied as, *e.g.*, Max Müller thought them to be,[37] the fact still remains that the categories of linguistics and of psychology have not been wrought into their present form by the same group of men or under the same group of interests. If there is a partial identity of scientific materials, there is no evidence of identity of categories. The comparative method will then obtain a certain scope, even if that scope is limited to trying-out of special methods devised by linguists inexpert in technical psychology.

I hesitate to set forth the point; but I am left with a queer impression that linguistics falls short of representing logic in somewhat the same way that psychopathology falls short of representing psychology. I do not so much refer to the prevalence of concepts like "phonetic decay," "empty words," "anomalism," etc., in linguistics, although these concepts certainly suggest human frailty quite outside the frame of classical logic. I do not

wish to construct a false epigram to the effect that linguistics is a kind of pathology of logic, attractive as this epigram might be. My point is that human facts are got at more readily in linguistics and in psychopathology than in logic and in so-called normal psychology.

For example, if I try to determine the logical modality of something and to affix the proper epithet (necessary, impossible, contingent, possible), I sink into a morass of factual doubts. But, equipped with the fundamental grammatical moods (imperative, indicative, subjunctive, optative), I can dismiss my doubts by describing them under one of these mood aspects, regardless of objective reality, truth to me, truth to Mrs. Grundy, or any situation except that depicted by the statement in question. The grammatical moods deal with evidence unweighed; the logical modalities require more weighing of evidence than is as a rule humanly possible. Psychopathology also deals with evidence unweighed. Particularly is this true of that portion of psychopathology which deals with false beliefs. Granted that some beliefs are *prima facie* fantastic and to us incredible. By the patient these fantastic and incredible beliefs are believed, but the nature and history of these fantastic beliefs may well be investigated to learn whether we are not dealing with a so-called wish-fulfilment (a Freudian technical term) or with a kind of degradation of what the linguist might term an optative attitude. But the majority of false beliefs are not *prima facie* fantastic and incredible. They on the contrary require the test of experience. They represent pragmatic situations. Granting the truth of certain hypotheses, we say, these beliefs might be accepted also as truth. Our thesis is that these pragmatic delusions do not represent a conceived wish-fulfilment, if by wish is meant a fancied situation. On the other hand, these pragmatic delusions appear to hang rather upon the degradation of a subjunctive attitude, that is, upon taking as true a certain hypothesis. But neither fantastic nor pragmatic delusions can readily be classed under the logical modalities, *e.g.*, as possible or contingent, however possible and contingent they actually seem to the patient. In any event they are or will shortly turn out to be impossible logically speaking, and, if the patient were to ascribe any logical modality thereto, he whould be likely to deal in necessities on the one hand and impossibilities on the other. Grammatically speaking, the degraded optative belief may even set into an imperative, and beliefs degraded from both the optative and the

subjunctive appeal to the patient as indicative, if not yet imperative.

From our superficial study of the categories of grammar as they revolve about the verbs, we have come upon two considerations of value that are not entirely obvious, the psychopathic analogue of the grammatical "voice," and the question of two main types of delusion degraded respectively from "subjunctive" and "optative" attitudes.

I believe that the "voice" distinction will forthwith appeal to all psychiatrists as valid within its range. The distinction seeks to express the relation between the world and the individual from the individual's point of view under two forms, (*a*) that in which the self is active and (*b*) that in which the self is passive in relation to the environment; but in the third place (*c*) the relation of the individual to himself is suggested, viz., under the "middle" or reflexive relation. Whether the reflexive relations of the self break up further into a group where the "I" dominates the "me" and another where the "me" overpowers the "I" (that is, whether the ego is sometimes active in respect to itself and sometimes passive), is a question partly of fact, but more of the nature of the self and of the whole difficult topic of self-activity.

Whether the distinction between pragmatic delusions (as it were, precipitated subjunctives) and fantastic delusions (as it were, precipitated optatives) is valid, must remain undetermined. The distinction has at least the value of suggesting a similar distinction in human character in general; both distinctions may be derived from identical psychological facts.

If in the practical handling of a patient, or indeed of any one else in a situation hard to interpret, the observer can make out the "voice" of the subject's situation from the subject's point of view, and can secondly determine whether the difficulty rests upon trouble with hypotheses or trouble with wishes, much is gained surely.

We saw also from our incidental study of person, number, and gender how important might become the question of monadic, diadic, triadic, or polyadic situations involving false beliefs. The collection of groups of such situations for analysis is certainly indicated, naturally with invariable reference to the "voice," active or passive, of the patient or central figure. Fiction and drama could throw some light on these matters.

In the gathering of data for analysis, it is clear also that the time-relations must also be studied from the patient's point of

view, to the end of determining whether the particular subjunctive precipitate has relation to some central point in the past, whether the particular optative precipitate has relation to a present or present perfect situation, or whether other "tenses" come in question.

REFERENCES.

1. MERZ, J. T.: "A History of European Thought in the Nineteenth Century," Vol. IV., Chap. X., "Of Society," p. 437. Blackwood, Edinburgh, 1904.
2. ROYCE, J.: "The External World and the Social Consciousness." Philos. Review, 3, 1894; and "Self-Consciousness, Social Consciousness and Nature," Philos. Review, 4, 1895.
3. SOUTHARD, E. E., editor: Contributions from the Psychopathic Hospital (Department of the Boston State Hospital), Boston, Mass., 1913 and 1914.
4. HENDERSON, L. J.: "The Fitness of the Environment, an Inquiry into the Biological Significance of the Properties of Matter," Macmillan, New York, 1913.
5. WOODS, F. A.: "The Influence of Monarchs, Steps in a New Science of History," Macmillan, New York, 1913.
6. WOODS, F. A., and BALTZLY, A.: "Is War Diminishing? A Study of the Prevalence of War in Europe from 1450 to the Present Day," Houghton, Mifflin, Boston, 1915.
7. WUNDT, W.: "Logik, Eine Untersuchung der Principien der Erkenntnis unter der Methoden wissenschaftlicher Forschung," 3 Aufl., Stuttgart, Enke, 1903.
8. SOUTHARD, E. E.: "The Laboratory Work of the Danvers State Hospital, Hathorne, Massachusetts. With especial Relation to the Policy Formulated by Dr. Charles Whitney Page, Superintendent, 1888–98, 1903–10." Boston Med. Surg. Jour., Vol. CLXIII., pp. 150–227, Aug. 4, 1910.
9. SOUTHARD, E. E.: "A Study of Normal-looking Brains in Psychopathic Subjects, with Notes on Symptomatology" (Danvers State Hospital material) to be published.
10. SIDGWICK, A.: "Fallacies, a View of Logic from the Practical Side," The International Scientific Series, Appleton, New York, 1884. "Distinction and the Criticism of Beliefs," Longmans, Green, London, 1892.
11. JAMES, W.: "The Principles of Psychology," Henry Holt, New York, 1890, Vol. II, Chap. XIX, "The Perception of 'Things,'" footnote, p. 114.
12. JAMES, W.: "The Varieties of Religious Experience, A Study in Human Nature." Being the Gifford Lectures on Natural Religion delivered at Edinburgh in 1901–02. Longmans, Green, London, 1902.

13. Southard, E. E., and Mitchell, H. W.: "Melancholia with Delusions of Negation: Three Cases with Autopsy," Jour. Nervous and Mental Disease, 1908, Vol. 35.
Southard, E. E., and Fitzgerald, J. G.: "Discussion of Psychic and Somatic Factors in a Case of Acute Delirium Dying of Septicemia," Boston Medical and Surgical Journal, 1910, Vol. 162.
14. Southard, E. E.: "On the Somatic Sources of Somatic Delusions." Jour. Abnormal Psychology, December, 1912–January, 1913.
15. Franz, S. I.: "Delusions," Popular Science Monthly, January, 1915.
16. Southard, E. E., and Stearns, H. W.: "How far is the Environment Responsible for Delusions?" Jour. Abnormal Psychology, June–July, 1913.
17. Southard, E. E.: "Data concerning Delusions of Personality. With Note on the Association of Bright's Disease and Unpleasant Delusions," Jour. Abnormal Psychology, October–November, 1915.
18. Southard, E. E., and Tepper, A. S.: "The Possible Correlation between Delusions and Cortex Lesions in General Paresis," Jour. Abnormal Psychology, October–November, 1913.
19. Campbell, A. W.: "Histological Studies on the Localization of Cerebral Function," Univ. Press, Cambridge, Eng., 1905, esp. p. 206.
20. Southard, E. E.: "A Study of the Dementia Præcox Group in the Light of Certain Cases showing Anomalies or Scleroses in Particular Brain-Regions," Am. Jour. Insanity, Vol. LXVII, 1910–11. On the Topographical Distribution of Cortex Lesions and Anomalies in Dementia Præcox, with some account of their Functional Significance, Am. Jour. Insanity, Vol. LXXI., 1914–15.
21. Brugmann and Delbrück: "Vergleichende Grammatik der Indogermanischen Sprachen," 1886–1900.
22. Wundt, W.: "Volkerpsychologie, Eine Untersuchung der Entwicklungsgeschichte von Sprache, Mythus und Sitte," I Bd., Die Sprache, 1900; H. 2, 2 Aufl., 1904.
23. Delbrück: "Grundfragen der Sprachforschung, mit Rücksicht auf W. Wundt's Sprachpsychologie Erortert," Strassburg, 1901.
24. Wundt, W.: "Sprachgeschichte und Sprachpsychologie mit Rücksicht auf B. Delbrück's Grundfragen der Sprachforschung," Leipzig, 1901.
25. Giles, P.: "Philology," Encyc. Brit., eleventh ed., Vol. 21, p. 431.
26. Wernicke, C.: "Grundriss der Psychiatrie in klinischen Vorlesungen," Thieme, Leipz., 1900, 2. Auflage, 1906, Psycho-Physiologische Einleitung, S. 1–78.
27. Peirce, C. S.: "Modality," Baldwin's Dict. Philos. and Psychol. Macmillan, New York, 1902, Vol. 2, p. 92.
28. James, W.: "The Principles of Psychology," Chap. IX., "The Stream of Thought," esp. pp. 243–248.

29. WHEELER, B. I.: "Language," Baldwin's Dict. Philos. and Psychol. Macmillan, New York, 1902, Vol. 1, p. 618, esp. p. 621.
30. GOODWIN, W. W.: "Syntax of the Moods and Tenses of the Greek Verb." Revised and enlarged. Ginn, Boston, 1890. Especially Appendix, "The Relation of the Optative to the Subjunctive and other Moods," pp. 371–389, with specific references to Delbrück.
31. FREUD, S.: "Die Traumdeutung," Deuticke, Wien, 1900.
32. CRAMER: "Die Halluzinationen im Muskelsinn bei Geisteskranken," Freiburg, 1889.
33. MAGNAN: "Leçons cliniques sur les maladies mentales faites à l'asile Sainte-Anne," Gazette méd. de Paris, 1877, and Progrés médical 1887–91. Also Magnan et Serieux, "Le délire chronique à évolution systématique" (Masson, Paris, no date).
34. KRAEPELIN: "Psychiatrie, ein Lehrbuch für Studierende und Aerzte," 8 Aufl., Bd. III, 1913.
35. DARLOW and MOULE: "Historical Catalogue of the Printed Editions of Holy Scripture in the Library of the British and Foreign Bible Society," Bible House, London, 1903, esp. Part IV, Indexes.
36. ROYCE, J.: "The Principles of Logic," Ency. Philos., Sci. I., Vol. 1, Logic. Macmillan, London, 1913.
37. MÜLLER, F. MAX: "The Science of Thought," Scribner, New York, 1887.

MENTAL EXAMINATION OF POLICE AND COURT CASES.*

By Robert M. Yerkes, Ph.D.

The group of cases constituted by those individuals who fall under arrest is far more heterogeneous than the inexperienced person usually supposes. It includes, among others, (1) persons of widely varying age, who, although physically and mentally normal, are victims of untoward circumstances; (2) individuals who are mentally deranged, temporarily or permanently, and who must be classified as psychopathic or definitely insane; (3) mental unfortunates, representing various sorts of defect, — imbeciles, morons, the mentally ill-balanced; (4) victims of drugs; among these those who have fallen prey to alcohol, morphine and hashish are conspicuous; (5) wrecks, who, although mentally sound, are physically unable to shift for themselves and accidentally fall into the hands of officers of the law.

This incomplete analysis merely suggests the variety of human material in the stream which flows endlessly through our police systems, our courts, reformatories, prisons and such other institutions as offer shelter to those who rightly or wrongly are suspected of criminalistic acts or inclinations.

Largely because of the extreme heterogeneity of the group of court cases, our preliminary methods of examining must be general and relatively superficial rather than special and intensive. They should supply data for classification, provisional diagnosis and the necessary basis for further study.

It may seem needless to insist — and yet actual practice and the published reports of many individuals who are engaged in mental examining argue otherwise — that the mental examination alone is wholly inadequate for the solution of such complicated human problems as court cases almost invariably present. To be sure, the mental examination should be as complete and accurate as may be, and should, above all, stand on its own merits, but in my opinion the individual who is charged with the study of a court case, whether he be psychologist, physician, sociologist or all of these combined, should obtain, either by his

* Being S. B. I. Contribution No. 1916.4 (whole number 146). The previous contribution, No. 1916.3 (145), was by E. E. Southard, entitled "On the Application of Grammatical Categories to the Analysis of Delusions," Philosophical Review, May, 1916. Published in Journal of Criminal Law and Criminology, September, 1916, Vol. VII, No. 3, pp. 366-372.

own observation or by the aid of assisting experts, adequate data concerning various important aspects of the life of the individual. Indeed, I should go so far as to contend that no examining expert should formulate diagnostive statements and prescribe treatment or advice for a court case without carefully considering in their varied relations the following five groups of facts: (1) the family history, heredity or genetic relations of the individual; (2) the environmental or individual history, including conditions and course of life in home, school and occupational or vocational centers; (3) the physical and medical history of the individual from birth, and his mental traits as exhibited especially in vocational relations; (5) mental constitution as revealed by psychological examination.

It is quite possible, and for many reasons desirable, that a single expert obtained these varied sorts of information and correlate the several facts with a view to obtaining a thorough understanding of his human problem and of gaining such insight into the life of the individual as will render possible wise advice or treatment as well as reliable objective description. For however much we may be impressed by the need of specialization, we yet must recognize that the human individual is unitary, and must, for best results, be dealt with as a whole, infinitely complex in constitution and relations, — an object, moreover, toward which the examiner must take an attitude of sympathetic interest if he is to be of human service rather than merely a gatherer of scientific information. But whether the facts concerning a given court case have been gathered by few or many observers, in the end a single highly trained, highly experienced, sympathetic and wise person should analyze and synthetize them in order to go as far as possible toward solving the problem of social maladjustment or conflict.

I am not attempting to magnify the importance of heredity, individual history and social relations as contrasted with mental constitution, but instead to plead for due regard to these several aspects of life. The psychological description of an individual seems the more difficult and the more important to me as my experience increases, and I would have the psychological examiner aided in all possible ways or taught to aid himself by broadening his horizon and deepening his human interests and insight.

This much by way of preliminary to the actual psychological examination of a court case. Assuming that an adequately

trained and experienced psychologist is at hand, the following procedure would seem both reasonable and profitable. The examination should be divided into two parts, — first, a general survey of the intellectual and affective characteristics of the subject; second, a special examination whose character and extent should be determined by the results of the general survey. Let us now consider in more detail the procedure in each of these parts of the examination.

The general survey, made, as I have suggested above, in the light of invaluable general information concerning the individual, should consume relatively little time, preferably not more than thirty minutes. It should be conducted along the lines of a well-established routine, with thoroughly standardized procedure and the use of varied and reliable norms. In the present status of our methods of examining, it seems fair to say that a scale for the measurement of intellectual characteristics constructed on point-scale principles, and a similar scale for affective characteristics, might be used to great advantage for this preliminary mental survey. The results would, at best, be inaccurate, and yet they should be roughly indicative of the intellectual caliber, affective constitution and dominant mental characteristics of the individual, and should definitely guide the examiner in the second part of the examination.

Moreover, a considerable number of cases should be satisfactorily diagnosed on the basis of such a general intellectual and affective point-scale examination as has been suggested. Among the types of case which would thus be eliminated by the first part of the examination are: (1) intellectual dependents, — imbeciles, morons; (2) the insane; (3) certain mentally normal individuals whose arrest was more or less accidental, or who can be clearly shown to be in some wise victims of circumstance. By this process of elimination the number of cases for special and detailed psychological examination should be reduced by at least two-thirds.

Every examiner who has had experience with delinquents, whether they be criminalistic in the usual sense or not, knows that only a certain minority of them, possibly under 25 per cent., are intellectually inferior to a degree which might adequately account for their social behavior. In the remaining 75 per cent. or more of this group of individuals there are recognized numerous cases of peculiar mental constitution, and especially of over-developed, underdeveloped or exceptionally related affective,

emotional or instinctive traits. It is the great task of progressive psychological examiners to devise and perfect valuable methods of studying them, for, when all has been said, they stand forth as at once the most difficult, the most perplexing and the most dangerous to society of all court and institutional cases.

In view of the above facts it is surprising indeed that we should, to-day, almost completely lack methods of measuring, or indeed of analyzing, affective and instinctive processes. For the measurement of intellect we have numerous methods and a few measuring scales, which, although unsatisfactory from certain scientific angles, are proving of great practical value when intelligently used. Most of our methods are at best crude practical devices, as they are used in mental examining. Now along with these demonstrably serviceable devices for determining the intellectual status of an individual we need correspondingly useful devices for measuring the affective or instinctive aspects of life. That these characteristics are measurable is certain; that we shall ultimately succeed in measuring them is, to my mind, equally certain. But the task is a difficult one, and our present attempts are even more crude than were those of Binet and his coworkers in measuring intelligence.

In calling attention to the intellectual dependent and the affectively defective types of court case, I have not lost sight of that relatively small group whose social difficulties may fairly be attributed, not to mental or physical constitution, but to unfortunate environment. Nor am I purposely leaving out of account those strictly medical cases in which physical deformity, disease or degeneration is chiefly responsible for asocial conduct. Difficult problems, it is true, may appear in connection with either of these groups, but I must repeat that my information, directly and indirectly acquired, forces me to emphasize again and again the extreme importance to society of the careful study and wise treatment of affectively peculiar delinquents or criminals.

To be employed as described above, the preliminary portion of a psychological examination for court case must, clearly enough, be used with skill and insight by a thoroughly competent person. No non-psychological "tester," however thoroughly trained in a routine and relatively mechanical procedure, can do justice to such cases. We professional psychologists cannot too strongly or too persistently condemn the practice of appointing inadequately trained persons to positions as psychological examiners. Especially in connection with court and other criminalistic work,

thorough training in several of the medical sciences and in psychology should be demanded as a background for the special professional training of the examiner in methods of mental measurement and individual analysis. Slowly but surely we are coming to appreciate the fact that our human problems demand the very highest type of intellectual ability, character and technical training. If our police systems, courts and penal institutions are to utilize the methods of psychology at all, it should be through the service of adequately trained professional psychologists.

The second and special portion of our psychological examination should, I am convinced, be relatively free from the characteristics of a routine procedure. The examiner should suit his methods to the particular case in hand, and should concentrate his attention on solving his human problem rather than on accumulating statistics by certain prearranged or prescribed rules of measurement. The solution of the problem should be approached, it may be argued, by special measurement of those aspects of mind which have been indicated by the preliminary examination as underdeveloped, overdeveloped or exhibiting peculiarities of relationship which may be of practical importance. The outcome of the special and detailed part of the examination should be something similar to Rossilimo's psychological profile of the individual. It should be a reliable picture of the mental constitution and status of the subject. Incomplete, it necessarily will be, but practically serviceable because representing the chiefly important groups of mental functions in their relations.

For my own part, I prefer to speak of a formula for the mind of the individual rather than a profile, and I earnestly hope that our progress in the development and use of methods of mental measurement may shortly enable us to describe the human mind, wherever such procedure is socially demanded, by means of a formula in which appear as numerators the values of particular mental functions or groups of functions for a given individual, and as denominators the normal or expected values (norms) for these same functions. I have already suggested this method of psychological description in a previous publication,* using a very simple formula in which provision is made for only four groups of mental functions. It is needless to insist that, as our methods of psychological examining improve, we shall tend to subdivide

* "A Point Scale for Measuring Mental Ability." Baltimore, 1915, p. 167.

our groups of functions, thus increasing the complexity of the formula and correspondingly increasing its serviceableness for practical purposes.

At the present moment it is sufficiently obvious that the special portion of an examination for court cases should take adequate account of at least the following groups of functions or aspects of behavior. To the list other and perhaps less important functions may be added, or reason may appear at any time for increasing the list by subdividing certain categories. This is almost certain to hold true of the memory processes, possibly also of reasoning and of affective characteristics. But however that may be, it would seem to be worth while to suggest the following categories: (1) motor ability, tested by means of definite measurements of degree of co-ordination, accuracy, speed, etc., of movement, in the case of each of a number of important forms of response; (2) sensory or receptive functions, degree or state of sensory development, defects and acuity in the more important sense modes; (3) perceptual characteristics, including speed, span and accuracy of various sorts of perceptual process; (4) attention, measured in several of its forms and aspects; (5) memory, again measured in several forms and with respect to several aspects; (6) imagination; (7) ideation, including determination of the number of ideas, their nature and relations; (8) associative tendencies; (9) judgment; (10) reasoning; (11) volitional control and suggestibility; (12) instinctive tendencies, classified and dealt with separately according to the practical need; (13) affectivity, including simple feelings, emotions, sentiments, measured as to their time-relations and strength; (14) reliability, including, so far as possible, measurements of moral judgments and honesty.

Not until norms have been established for the various important mental functions can even the most experienced examiner work to good purpose. It is only fair, therefore, in the present status of mental measurement, that we should recognize the disadvantage of the examining psychologist, and make reasonable allowance for the undue weight which he must give to his own experience and to more or less inadequate statistical materials. The situation seems in the main encouraging, for despite the unintelligent use of certain methods of mental measurement, despite, also, extravagant claims of practical serviceableness for psychology, it is plain that steady progress is being made toward better methods and more valuable results. Nowhere in the realm of practical psychological examining is there need for greater

circumspectness and conservatism than in connection with our court and criminalistic cases. I firmly believe that psychology can serve our courts and penal institutions far beyond the limits of our present achievements. But if we are to progress safely in our study of asocial individuals, we must take into account the complexity of the human problem, the necessity for further work on methods of examining, and the training, mental capacity and character of the examiner. In other words, we must act wisely and not overhastily, however great may seem the need and the prospect of useful information.

THE USE OF THE BINET METHOD IN HOSPITALS FOR THE INSANE.

By Robert M. Yerkes.

PSYCHOLOGIST, PSYCHOPATHIC DEPARTMENT, BOSTON STATE HOSPITAL.

The Binet method in its original French forms and in all American revisions except the Stanford is ill suited to the needs of hospitals for the insane. It is the purpose of this communication to indicate the chief grounds of unsuitability, and to suggest improvements over present procedures in the psychological examining of patients.

As is well known, the Binet method was originally developed as a practical means of classifying children with respect to intelligence in order that seriously subnormal individuals might be segregated. For this purpose, whether in home, public, private, reform or other schools, juvenile courts, and varied institutions for the special treatment of children, it has proved, during the past ten years, and still remains, of great practical value. Moreover, considering the characteristics of the procedure, its results are surprisingly reliable. It has been amply demonstrated that Binet measurements are most trustworthy between the ages of three and ten years;* that beyond the age of ten they are increasingly unreliable; and that for adults they are so highly inaccurate as to be unsafe even for practical purposes.

The reasons for these important facts are patent in the principles and materials of the method. For the earlier years of life, the so-called "tests" tend, on the whole, to be too easy, whereas those for the later years tend, as groups, to be too difficult. The child of six obtains in the Binet examination a fair chance to exhibit his maximum intellectual ability, but the adolescent of fifteen or the adult of thirty obtains far less satisfactory opportunity to do his best. Especially is this true if he happens to be of normal or supernormal intellect.

The main reasons for the disadvantage of the adolescent or adult are the following: (1) Fewer tests beyond age are given the adolescent or adult than the child. This obviously offers the latter wider opportunity for credit than the former. (2) For the adolescent period, as contrasted with the period of childhood, the

* This and succeeding statements apply to all forms of the Binet method except the recent Stanford revision.

groups of tests are not arranged according to successive years. Thus, there are tests for eleven and twelve years, but none for thirteen and fourteen. There is, again, a group of tests for fifteen, and then, finally, a group for the adult. (3) According to the usual method of giving the examination, too little weight is allowed the tests for the ages twelve and upward.

Since, then, it is scientifically demonstrated and at the same time generally known that the Binet method is eminently satisfactory as a preliminary mode of estimating the intellectual status of children, and at the same time quite as eminently inaccurate and unsatisfactory as a means of estimating the intelligence of adolescents and adults, the conclusion is unavoidable that institutions for the insane cannot safely depend upon this simple, popular and convenient psychological procedure, for the fact is that the majority of patients in our institutions for the insane are children neither in years nor in intelligence. However marked may be the mental deterioration of a victim of disease of the nervous system, his intellect is not strictly comparable with that either of infancy or of childhood. Indeed, to the experienced psychiatrist or psychologist it is evident that methods of studying the mental constitution or condition of the inmates of institutions for the insane and the psychopathic must, if they are to be serviceable, be especially suited to the characteristics of adolescence and maturity rather than to those of infancy and childhood.

The application of the Binet method in our State institutions, other than those primarily for children, is rather worse than a waste of time, because certain relatively inexperienced and untrained psychological examiners, physicians and other State officials are likely to accept the results as reliable and to base judgment upon them. In the psychopathic department of the Boston State Hospital we have employed the Goddard revision of the Binet method for several years as an initial part of our routine psychological examination. It became clear to the writer very early in his experience as psychologist to the institution — and in this conclusion his assistants without exception agree — that the method seldom yielded valuable information except as applied to children under twelve or to older persons of inferior intellect. For intellectually normal or supernormal adolescents and adults, whether mentally healthy or diseased, it has given either seriously misleading or disappointingly meager information. Case after case whose intelligence as measured by success in school and in the business of making a living rates as approximately average is

reported in our records as of a "Binet age" of nine, ten, eleven or twelve years. This is at once a serious injustice to the patient and an unfair report to the non-psychological physician who desires the aid of the psychological examiner in arriving at a correct diagnosis.

These and many more facts are so much a matter of common observation that it would be inexcusable to call attention to them were not the Binet method in various eminently unsatisfactory forms at present employed in several of our State hospitals for the insane. The psychiatrist, if criticized for this state of affairs, places the responsibility upon the psychologist, and the latter, if he be an expert in mental measurement, presents precisely the kind of information which this communication contains, and further, pleads persistently for more thoroughgoing modes of psychological examining. But as a result of this plea the hospital administrator sees the specter of an increased budget arise before him, and forthwith he changes the topic of discussion. The bare and brutal fact is, and it should be faced by our Commonwealth now rather than forced upon us later, that no such superficial and inspectional mode of studying any aspect of mind as the Binet method can justify itself in an institution where the success or failure, the life or death of human beings, depends upon advice which, in turn, is based upon the results of psychological analyses.

One outcome of our unavoidable dissatisfaction with the Binet method in the psychopathic department of the Boston State Hospital is the development, on the basis of principles radically different from those accepted by Binet, of the point-scale method of measuring intelligence. The theoretical and practical merits of this method have been presented in detail elsewhere.[1] We would indicate here certain of its practical advantages over the Binet method as apparent from the results of its application to approximately 3,000 individuals.

For our present purposes the salient facts are these: (1) Point-scale and Binet measurements agree closely for the ages five to ten years.* Beyond ten years the Binet method increasingly underrates intellectual ability, whereas the point-scale method yields results which correlate very satisfactorily with practical achievement and social measurement. (2) The point-scale method has the important advantage of enabling the examiner to take into account the significance of sex, language

* The Binet method overrates, if anything.

difficulties, race and social status in determining the intellectual rating of a given individual as compared with his social group. As contrasted with this possibility, the Binet method, being standardized in construction instead of based upon the use of norms, offers no such opportunity. (3) The point-scale procedure is more definitely described and prescribed than the Binet, so that far less is left to the whim or personal judgment of the examiner, and the results are therefore correspondingly more uniform and objective.

In support of our representations we wish to offer the conclusions of the clinical director of the Bureau of Juvenile Research in Ohio, Dr. Thomas H. Haines, as based upon the application of the point-scale and the Binet methods to 1,000 minor delinquents. We quote as follows from Dr. Haines' report: —

About 25 per cent. are 25 per cent. below the normal standards, or have coefficients of mental ability of .75 or less. Such a standard eliminates about half of the feeble-minded group set apart by uncritical application of Binet standards. There is no more reason for considering these 300 delinquents as feeble-minded than there is to denominate large numbers of productive laborers in the community high-grade morons. These delinquents test slightly under twelve years through inefficiency of the Binet scale.

By comparison of the Binet and point-scale ratings of 571 boys with each other, the point scale is shown to be a much finer measuring instrument. By this scale one can point out much more definitely the mental capabilities which are above and below normal. It is the rational procedure for beginning an analysis of character. Upon this basis one can more safely make recommendations for treatment, and prognosticate the future of the individual.

The Binet scale, compared with the point scale, breaks down in the examination of all persons of mental ages over ten years, very much as other investigators have shown it does with normal children. It underestimates mentality more and more from ten years onward. It likewise overestimates below eight years.[2]

In yet another report on the same group of individuals the following summary statements appear: —

The most conservative count, those who are feeble-minded by both the year scale and the point scale, yields a list of 239, or 24 per cent. Of nearly all of these it can be said they are so poorly endowed by heredity that reform is out of the question. The only means of preventing further delinquencies by these children is to protect them from the op-

portunities therefor. They are custodial cases because they lack the grey matter necessary for an education which would insure self-control. To keep them in reform schools is to wrong the reformable delinquents, and to waste the money which is being spent upon attempts to educate these subjects themselves.

What is most important to the judge and to other arms of the social service dealing with the delinquent adolescent — his ability to learn and to perform, his adaptability, the character of his loves and hates, and the tenacity of his purposes — must be learned by further testing and study of the organization of his personality.[3]

We wish to defend and recommend the use of the point-scale method in institutions for psychopathic and insane individuals only as a preliminary to thorough mental examination or as a means of determining the intellectual status of the patient. In our judgment, not more than thirty minutes should be devoted to such a preliminary survey on the intellectual characteristics of a case. There should then be given, if indications justify it, as thorough and detailed psychological examination, including the most important aspects of mind, as is practicable. Certainly not less than two hours will suffice for a reasonably careful and detailed examination.

There is one alternative to the rejection of the Binet method in such institutions, and that is the introduction of the new Stanford revision. This revision is only partially available at present and it is not well enough known to be safely evaluated. We have given it preliminary trial in the psychopathic department of the Boston State Hospital, and in our tentative judgment it is decidedly superior in many essential respects to any previous form of the method. Indeed, it is the first form of Binet's procedure which offers definite and well-judged rules for the guidance of the examiner. It furthermore has the great merit of offering additional groups of tests for adolescents and adults, so that the serious unfairness of the earlier revisions is certainly diminished if not wholly eliminated.*

There is, unfortunately, one serious disadvantage in the employment of the Stanford method. While remaining a preliminary intelligence scale, it requires much more time, especially for adolescents and adults, than do the earlier forms of the method. Indeed, the measurement of an adult is likely to require upward of an hour, and for the relatively inexperienced examiner, a

* Our results do not justify the definite statements concerning the reliability of the Stanford revision. We present impressions, not facts.

longer time. The importance of this expenditure of time can be appreciated only in the light of the fact that as a result of the Stanford examination one has obtained merely the intellectual rating of an individual. In other words, only one term, or group of terms, in the formula which should describe the mental constitution of the patient has been rendered available.

Gladly we acknowledge that the Stanford revision, so carefully and intelligently developed by Terman and his associates, may yield quite as reliable and useful measurements of intelligence as the point-scale method or any similar device. Should this prove to be true, the question of time required for use would become an important and perhaps a deciding factor in choice. Yet, for us, there are still more important considerations, for we are convinced by the facts of genetic psychology that the point scale is based upon principles which are far more satisfactory than those of the Binet method in any of its existing forms.

Finally, as the fruit of this discussion, we wish to recommend to the authorities of hospitals for the insane the following procedure in routine psychological examinations: —

A. Preliminary survey of intelligence by some form of point-scale method.

B. Preliminary survey of affectivity (that is, feeling, emotion, sentiment, instinctive modes of behavior or dispositions) by some form of point-scale method.*

C. Special measurements, the nature and extent of which should be determined by the results obtained under A and B.

In case of doubtful results in A, the most satisfactory form of the Binet method should be applied as a control.

Part B of this program is even more important in many cases than part A; hence the practical necessity for developing methods of measuring affective characteristics.

Under part C groups of measurements should be made for the practically significant aspects of mind and behavior. Obviously important are such measurements as the following: motor coordination, rapidity of response, sensibility, memory, imagination, ideation, judgment, reasoning, feeling, sentiment, inhibition, suggestibility, control.

* We are at present wrestling with the difficult task of developing an affective point scale similar in principle to our scales for measuring intelligence. Success in this will mean an important step forward in practical psychological examining. It may not be out of place to state here the disheartening fact that progress in this work lags because of the lack of financial support. We urgently need skilled assistants in this methodological work whose importance for all practical agencies which have to do with mental diseases, defects, delinquencies and crimes is obvious.

In order that a formula descriptive of the psychological make-up of an individual might be obtained, the supplementary measurements might, for example, be grouped in this relatively simple and obviously artificial manner: —

M = motor ability (co-ordination, rapidity, skill).
R = receptivity (sensory development, freedom from defects, acuity of sense, perceptual characteristics).
Mm = memory (auditory, visual, kinæsthetic, reproductive ability).
I = imagination (various kinds of constructive memory process, — mechanical, artistic, etc.).
T = thought (number and variety of ideas, nature of judgments, reasoning ability).
A = affectivity (nature and strength of feelings, emotions, sentiments).
C = control (characteristics of will, inhibitory power, suggestibility).

Supposing that a psychological examiner has made measurements of an individual with respect to these several groups of functions, and further, supposing that he has knowledge of the normal or average condition of the several functions, the following simple formula might be presented as descriptive of the mental constitution of a given individual: —

Mentality of individual X =

$$M\frac{39}{84} + R\frac{78}{75} + Mm\frac{63}{70} + I\frac{50}{68} + T\frac{41}{78} + A\frac{90}{73} + C\frac{38}{70}$$

in which the numerator represents the percentage ability of the subject X, and the denominator the average percentage ability for his group (those with whom it is fair to compare him).

This formula, translated briefly, would read: individual X possesses very inferior motor ability, normal receptivity, slightly inferior memory and imagination, very inferior thought capacity, strong affectivity, and markedly deficient control.

Further examination of such a case should reveal the specific nature of the affective peculiarities and the deficiency in control, as, for example, depending primarily on conditions of the sex instinct.

It is towards such descriptive formula for the minds of our patients, our delinquent or criminalistic wards, that the efforts of psychological experts should be directed. This work cannot be facilitated by insistent demand for practical and immediately applicable results; rather it must be fostered by appreciation of

the fundamental importance of sound methods and by freedom from the necessity of day by day demonstration of applicability. The work demands that social liberality which is inspired by wise prevision.

REFERENCES.

1. YERKES, BRIDGES and HARDWICK: "A Point Scale for Measuring Mental Ability." Warwick & York, Baltimore, 1915.
2. HAINES, THOMAS H.: "Relative Values of Point-Scale and Year-Scale Measurements of One Thousand Minor Delinquents." Journal of Experimental Psychology, 1916, Vol. 1, pp. 51–82.
3. HAINES, THOMAS H.: "Mental Examination of Juvenile Delinquents." The Ohio Board of Administration, Publication No. 7, December, 1915.

INDICATIONS FOR WET PACKS IN PSYCHIATRIC CASES; AN ANALYSIS OF 1,000 PACKS GIVEN AT THE PSYCHOPATHIC HOSPITAL, BOSTON, MASS.*

By Herman M. Adler, M.D.

Hydrotherapy has been in use in psychiatric hospitals for a long time, and all sorts of methods and theories have been employed with more or less success. Of late years, since the more modern ideas about hydrotherapy have gained the upper hand, elaborate provisions have been made in up-to-date hospitals for the application of Scotch douches, shower baths, needle baths, and so forth, whose effect has been reinforced by the use of steam baths, electric light baths, hot air, massage and mechano-therapy.

The favorable experience of Kraepelin with the prolonged bath, which has been corroborated by numerous hospitals all over the world, served to establish this method as one of the necessities of a modern psychiatric clinic. Wherever the baths are consistently and intelligently given, strikingly good results have been observed.

Indications for giving baths have not, however, been very definitely set, so that the custom differs somewhat in the various hospitals where prolonged baths are given in the routine fashion. In general, the chief indication for giving a prolonged bath is restlessness. A patient becomes excited, noisy and violent, and is placed in a prolonged bath. Indications for the pack, on the whole, are the same as for the bath, except that the pack is especially indicated when the patient's ability to co-operate, or his suggestibility, is reduced to a negligible quantity. Mere excitement does not mean necessarily that hydrotherapy should be resorted to. It has been established that the chief signs are loss of body heat and loss of water.[1] These two apparently go hand in hand, and cyanosis of the exposed portions of the body, especially the face, hands and feet, is an index of the rapidity and the extent of the process. Hydrotherapy conserves the body temperature. It prevents the evaporation of water from the skin. It probably replaces some of the water lost, and it offers a gentle, mechanical restraint against sudden or violent gestures or motions.

* Being S. B. I. Contribution No. 1916.6 (whole number 148). The previous contribution was by Robert M. Yerkes, entitled "The Use of the Binet Method in Hospitals for the Insane."

The wet pack, as it is usually given, consists of a number of sheets wrung out in water at about 100° F, and wrapped tightly around the patient's body and limbs so that he cannot move anything except his head, fingers and toes, and an outside wrapping of blankets pinned with large safety pins, so that the patient cannot roll out of them. When the patient is so restless and active that in spite of this he is likely to fall out of bed in consequence of a flexion and extension of his entire body, a restraining sheet or blanket is placed over him and pinned to the sides of the bed, and the foot end of the pack may be attached by means of a blanket and safety pins to the cross bar at the foot of the bed. In this way the patient is completely trussed and practically immobilized. In fact, this is so obvious, and the change from the violent agitation to the immobilization caused by the pack is so striking, that it must appear to many that the chief object of the pack is restraint, and is quite comparable to a strait-jacket or any other forms of restraint. As we shall see later, nothing can be further from the truth than this conception, and yet the similarity seems so great that even the attendants and nurses — not to say the physicians — frequently treat the pack as a form of restraint, and order it as a means of relief for themselves or the other patients from the disturbances caused by one who is merely noisy.

Where the degree of excitement is such that the gentle effects of the prolonged bath are not adequate, the restraining influence of the pack may be required to put the patient in the condition for the prolonged bath. The wet pack is applied for two hours. The patient is then removed whether he be still disturbed or not. If the patient has not fallen asleep or is not completely restored to quiet and self-possession, he is then placed in the prolonged bath.

The ideal temperature for the prolonged bath is not over 98° F. and not under 95° F. The water should be kept continually at this temperature, and the body should be immersed as far as possible in the water. The object of the pack is to produce an envelope of water or moisture-laden air at body temperature, and maintain this for the length of the pack. It has been shown that whether we start with cold water or warm water, the temperature of the pack readily adjusts itself to that of the body.[2] In cases of maniacal excitement, even though the patient may have fever, the surface of the body is losing large amounts of heat. It is wise, therefore, to start with hot sheets rather than cold

sheets, — the idea being to conserve as much of the body heat as possible.

The patient should be given water to drink freely throughout the pack, and an ice-cap should be placed upon the head, and a cold compress on the forehead, which should be frequently renewed.

In cases of alcoholism or drug addiction, or in cases that have been exhausted by prolonged febrile diseases, there is a certain amount of danger from collapse in the pack. Following the experience in European clinics, as well as in this country, a hypodermic injection of digipuratum, or digalen has been given almost as a routine in these cases. The ordinary preparations of digitalis such as the powdered leaves, the tincture or the extract, require sometimes as much as twelve hours before the effect is obtained. They are, therefore, useless for this purpose. The hypodermic preparations are much more prompt in their action, and have given excellent results. Since the outbreak of the war, however, it has been impossible to obtain these drugs except at prohibitive prices, and stimulation with strychnine or camphor has been resorted to in cases in which there seemed to be a danger of cardiac collapse.

While the physicians who have been employing the pack in a proper fashion have all become convinced of the fact that it is a valuable therapeutic measure, and in no sense to be compared to mere restraint, they have found this difficult to prove in individual cases; and in the face of charges brought by paranoid patients or their relatives, they have found it difficult to convince a prejudiced bystander of the difference.

With these ideas in mind, a closer study was made of a thousand packs that had been given in the course of routine management of the patients at the Psychopathic Hospital, and the results of this study are herewith presented. These cases were gathered from unselected clinical material in the order in which they were given, and represent 309 patients. As will be seen from the table, the diagnoses, organic and psychiatric, comprise a large variety, and only one factor was taken into consideration in the present analysis, namely, whether the patient was quieted by the pack or not.

According to this analysis, out of 309 cases, 155 were quieted by the packs, 56 were not quieted by the packs, 98 were quieted by some and not quieted by others, or, in other words, had a partial effect.

For the sake of convenience, I have grouped only the main classifications together. It will be seen that cases diagnosticated

manic-depressive insanity and dementia præcox are very nearly equal in number, — 79 of the former, 82 of the latter. But 326 packs were given in the 79 cases of manic-depressive insanity, with a quieting effect in 144, without quieting effect in 218 packs; whereas in the 82 dementia præcox cases only 217 packs were given, with quieting effect in 143, and without quieting effect in only 74.

The same disproportion is shown by the cases of manic-depressive insanity showing agitated depression. In 8 cases 26 packs were given, 8 with quieting effect, 18 without quieting effect. In all the other groups, including general paresis, delirium tremens, alcoholic hallucinosis and epilepsy, by far the majority of packs had a quieting effect.

It would seem, then, that excitement in conditions other than manic-depressive insanity is to be considered rather as a secondary manifestation, and one which is more easily controllable by hydrotherapy. Even in the cases of manic-depressive insanity, of course, a quieting effect was obtained a large number of times, but the packs that were given without quieting effect outnumbered those that had a quieting effect, indicating thereby also that the duration of the state of excitement and the intensity of the excitement are greater than in the other diseases.

These results are quite different from those obtained by the use of restraint without hydrotherapy. It is unnecessary here to recall the remarkable improvement in the condition of excited patients produced by the modern methods of non-restraint, in which diversion and occupation take the place of padded cells, strait-jackets and strong rooms.

More to the point, perhaps, will be the startling figures obtained in a study of the treatment of delirium by hydrotherapy at the Psychopathic Hospital, Boston, compared to the results of the older methods of restraint and depressing drugs without hydrotherapy employed at general hospitals. The mortality in general hospitals averages 26 per cent., the mortality in the Psychopathic Hospital, under hydrotherapy, more especially packs, averages 0 per cent.[3]

On account of these facts it is safe to infer that hydrotherapy, whether applied in the form of prolonged baths or as wet packs, has a therapeutic effect, which is not to be obtained by mere immobilization of the patient or by restraint.

The question of restraint, of course, is an important one for administrative reasons. However, these figures prove that the wet packs not only cannot be condemned for reasons of cruelty,

but that they are the most potent means of obtaining rest for a maniacal patient. The wet pack has been used at the Psychopathic Hospital consistently as an auxiliary to the prolonged bath, and bears the same relation to the latter that hypodermic medication bears to medication *per os*. A patient who cannot or will not swallow medicine may still derive the benefits from the drugs when they are administered subcutaneously. A subcutaneous injection of heart stimulant, for instance, may be applied against the wishes of an insane person. It may be applied in cases of unconsciousness, and so forth. It offers a means of applying a therapeutic agent without the co-operation or even the consent of the patient. In the same way the pack may be used to administer the beneficial effects of hydrotherapy, and in particular, of the prolonged bath, to patients who are so restless or excited that they cannot be induced to submit to the prolonged bath.

Diagnosis.	Number of Cases.	Number of Packs.	Quieting Effect.	Non-quieting Effect.
Dementia præcox,	82	217	143	74
Manic-depressive insanity: —				
Manic,	71	336	136	200
Depressed,	8	26	8	18
Alcoholic hallucinosis,	20	40	28	12
Delirium tremens,	20	34	21	13
Alcoholism,	5	7	6	1
Organic dementia,	4	14	7	7
Senile dementia,	4	6	5	1
Involution,	3	4	4	0
Epilepsy,	8	14	12	2
Paraphrenia,	2	3	3	0

BIBLIOGRAPHY.

1. Adler, H. M. and Ragle, B. H.: "Remarks on Hydrotherapy." (A Note on the Influence of Hydrotherapy on the Red Cell Blood Count in the Insane.) Boston Medical and Surgical Journal, Sept. 18, 1913.
2. Kraepelin: Psychiatrie, Ed. 8, Vol. I., p. 578.
3. Gregg, Donald, M.D.: "The Treatment of the Deliria in General Hospitals and in Hospitals for the Insane." Psychopathic Hospital Contribution, 1913, No. 10.

A STUDY OF SOME CASES DIAGNOSED AS PARESIS IN PRE-WASSERMANN DAYS.*

By Lawson G. Lowrey, A.M., M.D.

Fellow in Neuropathology, Harvard Medical School; Pathologist, Danvers State Hospital, Hathorne, Mass.

CONTENTS.

I. Introduction.

It has been customary for many years, at the Danvers State Hospital, to present newly admitted cases before the assembled staff for diagnosis. Records of such staff meetings have been kept since May, 1898. For some years past every case admitted has been so presented.

Between May, 1898, and the early part of 1912 (prior to the routine use of the Wassermann test) paresis was considered in the diagnosis of about 810 cases so presented. The Wassermann test on the blood serum was made a part of the routine examination of patients admitted in May, 1912 (although used in selected cases in 1910), and no case is here considered in which a Wassermann test was obtained before diagnosis.

In the fall of 1914, 58 of these cases were still in the hospital. While we must realize that these are unusual cases, in that the

* No. 56, Danvers State Hospital Papers. Read by invitation before the meeting of the New England Society of Psychiatry and Neurology, Northampton, Mass., March 30, 1915. Reprinted from The Journal of Nervous and Mental Disease, Vol. 43, No. 4, April, 1916.

majority of the real cases of paresis diagnosed in the period under consideration were dead, it nevertheless seems worth while to analyze these cases and determine (*a*) the correct diagnoses and (*b*) the confusing symptoms. Such a study should be of aid in avoiding such errors in the future. This study gives no idea of the accuracy in the diagnosis in paresis, which has been estimated by Southard [1] (on autopsied Danvers cases) at 85 per cent.

These 58 cases fall conveniently into three groups, which are considered separately. In 13 cases paresis is considered "possible," since paresis could not be excluded, although the case was classed in some other group. In group 2 there are 17 cases in which the diagnosis is considered "probable," opinion among the staff being divided, but favoring paresis. The third group comprises 28 cases considered "certainly" paresis, all members of the staff concurring in the diagnosis.

The method of investigation was as follows: The chief facts as regards onset, signs and symptoms and course were tabulated. A brief examination was then made of each case with reference to the chief neurological and mental findings of paresis. The blood serum (in all but a few) was submitted to the Wassermann test, and in certain cases (where there was a positive blood test, or where the symptoms were sufficiently indicative) the spinal fluid was also submitted to the Wassermann test and to the other tests which are applied in this laboratory, — *i.e.*, albumen content, globulin content, number of cells and the gold sol reaction. As is, of course, well known, cases of paresis in which biological alterations in the spinal fluid are not present are almost unknown. The converse — that psychoses such as dementia præcox and manic-depressive insanity practically never show such alterations — is also true. Hence in these cases such examinations are of great value in checking up the diagnoses.

II. Analysis of Cases.*

Group I. "Possible," 13 Cases.

Eleven of these cases are definitely not paretic. The final diagnoses were all determined as the result of clinical observation alone, and none have been in any way altered as a result of the present investigation. In none of these was paresis definitely ruled out when presented at staff meeting.

*Such symptoms as depression, excitement, hallucinations, etc., are not included in this brief list, since they are not in themselves at all characteristic of paresis.

They were admitted at varying times between 1897 and 1911, and the duration in the longest case is about eighteen years. The final diagnoses are: dementia præcox, 4; manic-depressive, 1; alcoholic dementia, 3; imbecile (alcoholic), 1; chronic delusional insanity, 1; organic dementia, 1. There was knee jerk alteration in 7 cases (exaggerated 5; lost 2); pupillary abnormalities in 5 (inequality and irregularity; sluggish light reaction in 2); 5 were demented; 3 were euphoric; 1 gave a syphilitic history.

The blood Wassermann was negative in 8 (including the case with specific history) and was not done in 3.

The two remaining cases in this group are of some interest, the first because the possibility of paresis has been confirmed, the second because, despite observation over a prolonged period, the correct diagnosis is still undetermined.

Case 1. — Hospital No. 16564, Male. Admitted January, 1912. Age 41. Mother senile dement. Father alcoholic. Uncle tubercular. Brother epileptic. Gonorrhœa and venereal sore at 20. Attempted suicide at 16. Alcoholic since 20. Delirium tremens once. Married five years; one miscarriage and one living child. Three fainting spells in 1911. At time of entrance excited, restless, flight of ideas, visual hallucinations, insomnia, euphoria, mannerisms. Pupils unequal, sluggish reaction to light. Knee jerk increased. Diagnosis: manic-depressive insanity, manic; paresis not excluded. At present: left pupil larger than right and stiff to light. Right is irregular, has a slight light reaction. Knee jerk normal. Tremor of hands. No speech or memory defect. Wassermann reaction: blood, twice doubtful, spinal fluid positive. Albumen and globulin increased; gold test positive: 63 cells per cubic millimeter. Determined diagnosis: paresis.

Case 2. — Hospital No. 15689. Male. Admitted July, 1910. Age 30. Onset in 1906 with a "paralytic" stroke from which he made a good recovery. In 1908 epileptoid attacks began. These came about once in two months with a period of confusion following. These attacks gradually became more frequent, and he was committed to Danvers in 1910 after a very severe attack, which left him restless, deluded and apparently hallucinated. He gradually cleared up. There was slight right hemiplegia, knee jerk increased, and a Romberg sign. Following his convulsions he shows ankle clonus and Babinski sign. The convulsions start in the left forearm (he once had 27 convulsions in one day). Diagnosis: Brain tumor preferred; syphilitic dementia? paresis? Blood Wassermann negative in 1911. Anti-specific treatment pushed with no effect. At the Massachusetts General Hospital in 1912 he was regarded as a case of insular sclerosis, and there were "no signs indicative of brain tumor." At present all tests on the fluid are negative. Knee jerk much

increased, right more than left. Slight euphoria. Left side of face is full. Left hand and arm weak and inco-ordinate. Speech defect, marked memory defect, marked attention defect. This unclassed case seems to be perhaps a case of tumor involving the right postcentral gyrus, or a case of epilepsy.

Group II. Probable, 17 Cases.

This group presents some interesting problems in the differential diagnosis of paresis, but it is very difficult to present satisfactorily. The problems are not sufficiently important to present an abstract of each case, so I shall simply state the conclusions.

Not one of these cases is clinically or serologically paresis. The determined diagnoses — most of them the result of clinical observation alone — are: dementia præcox, 10; alcoholic dementia, 3; paranoid condition, 1; imbecile, 1; toxic psychosis, 1; arteriosclerotic dementia, 1. The blood Wassermann was positive in 1 case, negative in 14 and not taken in 2. All tests on the spinal fluid were negative in 4 cases (including the case of dementia præcox with positive blood).

Analysis of symptoms likely to be confusing shows that knee jerk alterations occurred in 11 cases (absent, 1; exaggerated, 10) and pupillary alterations in 9 (unequal, 2; irregular, 1; sluggish, 2; consensual reaction lost, 1; unequal and irregular, 1; unequal and sluggish, 2). Five presented speech defect; 5 showed grandiose delusions; 5 were demented; 4 showed a Romberg sign. Three gave histories of syphilis, but the Wassermann is not positive in any of them, nor are there signs of paresis.

The high incidence of dementia præcox in the determined diagnoses is of interest. In the case books the diagnoses were as follows: Paresis? 3; paresis or alcoholic dementia, 2; paresis or dementia præcox, 6; paresis, organic dementia or dementia præcox, 1; paresis or manic-depressive, 2; paresis or organic dementia, 1. Dementia præcox was not, therefore, considered in the diagnosis of as many cases as eventually turned out to be such. It is furthermore clear that the differentiation of these two psychoses is not always easy on clinical grounds alone.

Group III. Certain, 28 Cases.

It is necessary to divide this group into two subclasses: (*a*) 8 cases which are clinically and serologically confirmed. (*b*) 20 cases in which the diagnosis was not confirmed.

At the time of presentation before the staff for diagnosis, all members agreed, but in 10 cases the diagnosis had been changed before this study was undertaken.

(*a*) The clinical course and laboratory findings substantiate the diagnosis in all 8 cases. One case has died since this study was begun, with confirmatory autopsy. The others present typical clinical pictures. In 7 cases the blood Wassermann is positive, and all tests are positive in the fluid in all 8 cases. The duration has been three years in 2 cases; four years in 2; five years in 1; six years in 1; eleven years in 1.

(*b*) This group of 20 cases, none of whom are paretic, fall into 2 classes: (1) 14 cases in which some other diagnosis is certain and (2) 6 cases, which, for one reason or another, must be left unclassed.

(1) Of these 14 cases 7 are cases of dementia præcox, and in 5 of these the diagnosis was long ago corrected. Among these the blood Wassermann is negative in 6, positive in 1. In 2 cases all tests in the spinal fluid are negative. The duration in these cases is from eleven to eighteen years.

In the remaining 7 cases of this subgroup the blood Wassermann is negative, and all tests in the spinal fluid are negative in 2. The determined diagnoses are: organic dementia (arteriosclerotic), 1; alcoholic conditions, 3; hypochondria with involution features, 1; paranoid condition, 1; manic-depressive, 1.

The symptom analysis of the 14 cases shows pupillary abnormality in 12 — 1 presenting unequal pupils; 3 sluggish, 1 irregular and sluggish; 3 unequal and sluggish; 2 unequal and irregular; 1 unequal and irregular, without reaction to light or accommodation; 1 unequal, irregular and sluggish. Knee jerk alterations occurred in 12 cases, — 1 absent, 2 unequal and 9 exaggerated. Tremors of various types occurred in 6; 5 showed speech defect; 4 a Romberg sign.

(2) The 6 unclassed cases merit individual consideration, since each presents some unusual problem of diagnosis. In all cases the diagnosis of paresis was unanimous when patient was presented.

Case 1. — Male. Hospital No. 14043. Age 41. Admitted January, 1908. First committed to Danvers at the age of 38, when the findings were much the same as at this second commitment — with knee jerk normal, confusion, speech defect, visual hallucinations, and slight pupillary light reactions. In 1910 there were delusions of grandeur, euphoria and speech defect. In 1913 and again in 1914 the blood Wassermann was

negative, and all tests in the fluid are negative. Memory is fairly good. Hallucinations denied. He stammers (teeth?). Tells a very involved story, running from one subject to another. Pupils unequal, good light reaction. Knee jerk normal. Slight general tremor. Grandiose delusions. Not a paretic, — exact diagnosis uncertain.

Case 2. — Male. Hospital No. 14077. Admitted January, 1908. Age 46. Onset at 40 with an apoplectic attack with subsequent great memory loss. History of syphilis. At time of entrance: Pupils small, equal, slow light reaction; knee jerk increased; feet drag in walking; emotional and mental instability. Blood Wassermann negative in 1910, and blood and fluid are both entirely negative now. Physical signs at present are those of residuals of shock, plus a great memory defect. The most probable diagnosis in this case is arteriosclerosis (the arteriosclerosis perhaps due to syphilis).

Case 3. — Male. Hospital No. 15795. Admitted September, 1910. Age 42. Father died at 62 suffering from same condition, also called paresis. Insanity on maternal side. In 1906 patient became careless, forgetful, sat around and did not work. Three months later there was a convulsion followed in a month by another and from then until the time of commitment there was a convulsion about every four months. The head turned to the right; there were clonic spasms of the right arm and leg with cyanosis. Occasional vomiting at the end. Every three or four days a mild seizure, when he was confused but not unconscious. At time of entrance, knee jerk diminished, pupils large, irregular and unequal and *dilating* to strong light. Speech defect. Optic atrophy. Disorderly. Confused. Shattering of recent memory. Condition at present unchanged. Frequent convulsions. Tells same story now as when he first came. The blood and fluid were each twice negative to all tests. This is certainly not paresis. Possibly epileptic or tumor.

Case 4. — Female. Hospital No. 16111. Admitted in April, 1911. Age 51. Married. Five living children. One died at three days. Two miscarriages. Onset at 41 with gait difficulty and diminution of vision. At time of entrance, blind; apprehensive; knee jerk diminished; pupils stiff to light. At present she is bedridden; the eyes constantly roll to the right and are apparently corrected voluntarily; pupils are unequal, slightly irregular and do not react to light; has no insight; knee jerk absent; incontinent. Blood and fluid Wassermann negative: slight increase in globulin and albumen; 6 cells per cubic millimeter. There is a slight change in the third, fourth and fifth tubes in the gold test.

The most probable diagnosis in this case seems to be tabo-paresis, (in which the laboratory findings are often confusing).

Case 5. — Male. Hospital No. 16356. Admitted August, 1911. Age 34. Always wild. History of syphilis. Brother admitted to Danvers last summer and is a paretic. At time of entrance patient showed lively reflexes, ptosis, no light reaction in right pupil, slight in left, elated,

irritable. In 1912–14 the blood Wassermann was negative. In 1914 the fluid was negative on two occasions. Pupils are unequal, and right is stiff, while the left reacts slightly to light. Knee jerk normal. Mentally he is much like a neurasthenic.

This seems most probably a case of manic-depressive insanity.

Case 6. — Male. Hospital No. 16456. Admitted November, 1911. Age 40. At 35 trouble with walking; feet dragged. Physical signs those of spastic paraplegia. Mental symptoms a short time before admission. At time of entrance, spastic paraplegia; both pupils reacted fairly well to light; euphoria; grandiose ideas; diminished pain sense below the knee. At present, pupils unequal and irregular, good light reaction; knee jerk much increased; marked dementia; euphoria; speech defect; clonus; double Babinski. Wassermann negative on both serum and fluid twice. Marked albumen and globulin excess; cell count 26 per cubic millimeter; gold reaction positive for syphilis. This case is probably one of paresis; against this, however, are the active pupils and the negative Wassermann.

III. Discussion.

If we consider only the cases in which paresis was "certain" (by unanimous agreement of the staff) we find only 8 cases in which the diagnosis has been unequivocally substantiated (with 2 more in which it is probable). Six (or 4) cases, for various reasons, remain unclassed, while of the remaining 14, 7 are cases of dementia præcox. It is striking that the determined diagnoses of dementia præcox (in all groups) far exceed the number of cases in which this diagnosis was considered at the time of presentation.

The fact that paresis and dementia præcox may often be hard to distinguish has received but little attention, at least in modern literature. Kraepelin, in the 1913 edition of his textbook, says (Vol. II, pp. 522–523):

Bei der Abgrenzung der Paralyse von der verschiedenartigen Zustandbildern der Dementia præcox werden aus der verschiedenen Art der sich entwickelnden psychischen Schwäche gewisse Schlüsse möglich sein. In der Paralyse steht die Gedächtnisschwäche, die Unklarheit sowie die Beeinflussbarkeit der Stimmung und des Willens im Vordergrund, bei der Dementia præcox dagegen die gemütliche Stumpfheit bei Erhaltung des Gedächtnisses und der Klarheit, ferner die eigentümliche Verlust des Zusammenhanges zwischen Vorstellungen, Gefühlsregungen und Willen. Dem paralytischen Schwachsinn fehlen die Verschrobenheit, die Manieren sowie die periodischen Erregungen, dem Stupor der zähe, unbeeinflussbare Negativismus, wenn auch Nahrungsverweigerung, Stummheit, Reaktionslosigkeit längere Zeit hindurch bestehen können.

Again (Vol. III., p. 965):

Die Abgrenzung der Dementia præcox von der Paralyse hat durch das cytologische und namentlich das serologische Untersuchungsverfahren fast alle ihre früheren Schwierigkeiten verloren. Bei der gelegentlich vorkommenden Verbindung mit Lues finden wir wohl Komplementablenkung im Blute und vielleicht Zellvermehrung in der Spinalflüssigkeit, niemals aber die für die Paralyse so kennzeichnende Wassermannsche Reaktion in der letzteren. Berücksichtigt man weiter die körperlichen Zeichen der Paralyse, namentlich die reflectorische Pupillenstarre, die Sprach- und Schriftstörung, die mit Herderscheinungen einhergehenden Anfäll, so wird die Unterscheidung meist leicht sein, zumal auch schon das Lebensalter der Kranken gewisse Anhaltspunkte fuer die Beurteilung liefert.

Since we have found in the analysis of these cases that many of the physical signs are often confusing, — as a case of dementia præcox may have unequal, or irregular pupils, or the light reaction may be "sluggish," with active knee jerk, etc., — it appears that serological investigation is very important in all cases in which paresis is suspected. It is, of course, true that in the majority of cases prolonged clinical observation will establish the correct diagnosis. We have, however, in the Wassermann and spinal fluid tests, a method which allows us to verify or disprove the certainty or suspicion of paresis in a very short time. This cannot be too strongly emphasized. (A forthcoming paper will deal in full with the results of such tests.)

It is worth while pointing out that no such group of cases (*i.e.*, cases in which paresis was positively diagnosed) could be found among the patients admitted since the Wassermann and spinal fluid tests became a part of the routine observation of patients in which we would find the diagnosis of paresis made in cases which were not paretic or belonging to the brain syphilis group. This point has been made by Morse [2] in connection with her summary of the results of spinal fluid tests. Had the Wassermann and spinal fluid tests been known at the time these patients were presented for diagnosis, paresis might have been confirmed or excluded in all the cases presented in this paper at that time.

Summary.

1. Data are presented dealing with 58 cases diagnosed with more or less certainty as paresis at Danvers between May, 1898, and May, 1912 (prior to the routine use of the Wassermann test).

2. Of 13 cases in which paresis was not excluded, 1 is a paretic and 1 remains unclassed. Of the other 11, 4 are cases of dementia præcox, and the diagnoses were long ago established.

3. Of 17 cases in which paresis was the probable diagnosis, not one is a paretic. Ten are cases of dementia præcox.

4. Of 28 cases in which paresis was certain, 8 are paretic and 2 more are probably so. Fourteen cases can be definitely classed elsewhere, and 7 are cases of dementia præcox. The other 4 cases are not paretic, but cannot be classed.

5. The serological investigation of cases in which paresis is suspected is an absolute requisite for establishing a correct diagnosis. Had the Wassermann and spinal fluid tests been known at the time these patients were presented for diagnosis, paresis might have been immediately excluded or confirmed. Clinical observation over a sufficient length of time will correct the diagnosis in the majority of cases, but this method has very obvious disadvantages.

6. This study presents a basis for the conclusion that dementia præcox is often extremely hard to differentiate from paresis. A case of dementia præcox may present unequal pupils, exaggerated knee jerks, etc., and it is here that laboratory tests are of great aid.

I must express my deep obligation to the senior members of the clinical staff for much valuable assistance and advice, without which this study could not have been completed.

REFERENCES.

1. Southard, E. E.: "A Study of Errors in the Diagnosis of General Paresis." Jour. Nerv. and Ment. Dis., Vol. 37, 1910.

2. Morse, Mary E.: Correlations of Cerebrospinal Fluid Examinations with Psychiatric Diagnoses. A Study of 140 Cases." Boston Med. and Surg. Journ., Vol. CLXX., 1914.

ON DESCRIPTIVE ANALYSIS OF MANIFEST DELUSIONS FROM THE SUBJECT'S POINT OF VIEW.*

By E. E. Southard, M.D.

PATHOLOGIST, MASSACHUSETTS COMMISSION ON MENTAL DISEASES; DIRECTOR, PSYCHOPATHIC HOSPITAL, BOSTON; BULLARD PROFESSOR OF NEUROPATHOLOGY, HARVARD MEDICAL SCHOOL.

I fear that the present paper may be regarded as an elaboration of the obvious. I am, however, the more content with such a view of my analysis in that the psychiatric world of late has been invited to much that is far from obvious. The term "manifest" in my title suggests that the so-called "latent" in so-called "mental mechanisms" is not here to be "analyzed," if indeed it be susceptible of analysis in the classical usage of the term. Likewise, the term "descriptive" in my title indicates that no claim is made to "explanatory" analysis, if indeed analysis (in the classical sense) ever did "explain" anything. In short, if the descriptive analysis of the manifest in false beliefs here meant turns out to be a valuable preliminary to work on "mental mechanisms," I shall have no objection. But I do feel that so-called "psycho-analysis" or any other so-called "analytic psychology" which begins to synthesize (*e.g.*, to symbolize) from the outset is more likely to import the examiner's own beliefs (true or false) into the particular psychopathic situation than to extract the patient's beliefs therefrom. And this remains true even if the patient's beliefs are not the *primum movens* of his total attitude or behavior. For, granting that *aliquid latens* is actually at work, it is important to know also what the subject thinks is at work. Surely the subject's thoughts about whatever is manifest to him modify his attitude or behavior to some degree, and form at least a part of his rationalization thereof. If the total process of reasoning is not "conscious," surely *some part* of the reasoning process *sometimes* is conscious and employs cognitive factors.

I attempt to deal in fine with beliefs and delusions (*a*) that are *manifest not latent;* (*b*) by a process that is *analytic not synthetic;* (*c*) to the immediate end of *description not explanation;* and (*d*) from a point of view that is *subjective to the believer* and

* Being M. C. M. D. Contribution, whole number 150 (1916.8). The previous contribution was by Dr. L. G. Lourey, entitled "A Study of Some Cases Diagnosed as Paresis in Pre-Wassermann Days."

(so far as possible) not subjective to the examiner and without pretense to being objective as the total account of a psychopathic situation.

The attempt is in no sense a critique of analytic psychology, and, in fact, grew out of practical necessities in the clinic of the Psychopathic Hospital in Boston, where a stream of internes and assistants, medical and social, flows in and out without particular previous instruction in psychopathology or compensatory knowledge of the world. The prime necessity here was to supply captions, compartments, items indispensable to the proper analysis or later synthesis of a given psychopathic situation. Faced with such a situation as presented by a perfectly lucid patient, the tyro in psychiatric examination is embarrassed by riches of information, by a luxury of woe, which at first seems infinite in dimensions, perhaps hopelessly tangled. Conflicting accounts by the patient, by one or more parties in the patient's *entourage*, by public or social agencies, by previous physicians, to say nothing of the prejudice of first impressions by the examiner, combine to confuse the very elect. The examiner's possible preconceptions that "*nothing manifest is at all likely to be the 'real' explanation*" make confusion worse confounded. The examiner dashes after Ariadne's thread without due consideration whether or no there is a labyrinth at all. What therefore, I asked, was the indispensable minimum of items required for orientation in a patient's seemingly (to him) altered, seemingly (to us) delusional world?

I offer below a list of such items in an orienting analysis of seemingly false beliefs. The process by which the list was arrived at seemed to possess intrinsic interest and is therefore described, although the value of the items depends in no wise upon the technique of their choice.

The fact that the items are as ancient as the foundations of grammar is of some interest. The descriptive biologist in his capacity as behaviorist might well seek for the subheadings of his descriptive science in logic itself. Studying as are we a subjective situation rather than primarily an objective history of actual events, it was perhaps natural that grammar and rhetoric rather than logic should supply suggestions for descriptive headings; *e.g.* (and see also below), what seems necessary to the patient *is objectively not "necessary," but it remains "imperative."*

I have been able to clarify at least my own mind by resort to some of the more obvious categories of grammar for the purpose of analysis of delusions. I feel sure that several of the distinc-

tions made will appeal at once to the majority of psychopathologists as they have appealed to a number of my colleagues in practical work. The categories chosen are, in fact. so many thousand years old that they cannot fail to be of some value, as I think will appear on inspection of that division of verb theory dealing with person, number, gender and tense, that is to say, it must be obvious to the layman, to say nothing of the psychopathologist, that it is important to know who inhabits the universe of the patient's false beliefs, how many persons are involved in the delusional universe, what the sex of those persons is, and when and for how long the noxious event or condition is thought to have occurred or lasted. Indeed it may be regarded as a fact, or at any rate as a pious wish, that all proper histories of patients contain enough upon which to ground a judgment as to person, number of persons, sex and time in the alleged delusions. If grammatical categories are of any special value here, it is only that they give us a certain sense of completeness as to possible items of evidence relative to false beliefs. Clearly enough, the tyro in psychiatric examining often does not know how far to go in the taking of evidence, and rarely ends taking a history without a gnawing sense that he might well go infinitely farther in securing testimony. Accordingly, I had for some time been seeking some convenient termini for history-taking to which a tyro might safely pin his faith. I find that the grammatical items just listed not only satisfy the tyro and give him a sense of relative completeness in examination, but they can also serve fairly well as a basis for more elaborate examination.

In addition to these obvious items (person, number, gender, tense), which might as easily have been developed from anybody's inner consciousness as from a review of grammatical categories, I wish to call attention to two distinctions of equal interest but of somewhat more doubtful value, and at any rate of far less obvious derivation from the facts as the patients present them. The two categories in question are those of the grammatical "voice" and of the so-called grammatical "mood," or mode. Before developing what I consider to be the values of the categories of voice and mood, let me repeat that the kind of analysis I wish to support in the first instance is analysis directed at what may be called the manifest rather than the latent aspect of the psychopathic situation. I do not mean to say that analyses, itemized as I here suggest for the manifest, would not be equally suitable in the realm of the latent. My plea would be

for an *analysis of the manifest in the delusional universe prior to that of the latent.*

Let us turn to the grammatical categories of voice and mood. First as to the category of the voice, with its subdivisions, active, passive and middle (or reflexive). I learn that my colleagues find the grammatical voice condition as it were to "click into place" in their analysis of a great many delusional situations. In our difficult combination of extensive and intensive work at the Psychopathic Hospital in Boston, where we deal with a great many cases that are not obviously insane or certainly psychopathic, we have naturally developed a technique of examination *more Socratico.* It is clearly not advisable as a rule to ask a patient whether he is in the active voice toward his environment or whether he is passive therein; and it is clearly far from likely that the patient would understand being placed, as it were, in the middle voice. Nevertheless, it is surprisingly easy to develop what the patient believes as to his active or passive relation to the environment, and this by means of a very few questions. It certainly takes far less than the proverbial "twenty questions" to determine whether the patient is manifestly and subjectively in an active and dominant relation to his fellows, in a passive relation thereto, or in a personal plight of difficulties with himself. Mixtures of these relations also occur. Nevertheless, it is surprisingly often the case that the total situation conceived by the patient as altered is one to which one of these three categories of the grammatical voice — active, passive and reflexive — may be given. It is plain that now and then a patient regarding himself as dominant in his environment may assume a passive attitude, as of one in ambush or playing 'possum, or on the principle that "still waters run deep," and the like. It is likewise plain that a patient regarding himself as overwhelmed by his *entourage* may become counteractive to somebody therein whom he takes to be a special foe. In these instances of the subjectively-dominant-person-playing 'possum, and the subjectively-overwhelmed-person-counteractive, we are undoubtedly dealing with *objectively* passive and *objectively* active persons. Subjectively, analysis promptly shows, the patients in question are, as it were, *actively playing 'possum,* and on the basis of being overwhelmed, as it were, *passively counteractive;* that is, active in the capacity of a victim. It would seem a contradiction in terms to speak of the proverbial caged beast as passive; objectively the beast is as mobile as you please; subjectively he is

full of feelings of effort, etc., but he is, nevertheless, both objectively and subjectively in the passive voice, grammatically speaking. Suppose, now, we are confronted with a patient feeling, as so many feel, "cabin'd, cribb'd, confin'd," despite the objective absence of such bonds; is it not wise to regard the responsive activities of the patient as quasi normal, namely, as not (from the patient's point of view) essentially other than what a normal person would do under the circumstances? The fact that the circumstances are delusional does not render them any the less credible and credited by the patient.

I think it may be at once recognized that there are certain values attaching to the statement that the patient is in a general way in the active voice or in the passive voice with respect to his environment. It is not so certain that the category of the middle voice is equally valuable. I find that the middle voice again splits up into two; that there probably is an active and a passive form of the reflexive or middle voice. There are probably at least two sorts of internal psychopathic situations which may be characterized by the term *reflexive*. It is, of course, probable that there are two sorts of moral situation in general which comport with this distinction. For the present, however, I am insisting merely upon the value of these distinctions on the psychopathic side. I would make employment here of the distinctions between the forms of self so beautifully described by James in the chapter on the consciousness of self in his "Principles of Psychology." He there speaks of the following three kinds of self (I omit "pure ego" from the present discussion): the *spiritual, material* and *social selves*. Dismissing for the moment the social self as having to do largely with the relations of the subject to his environment, I would consider especially the spiritual and material selves, or "ego" and "me" of James' nomenclature. Just as the patient's relations to his environment may be formulated as follows: —

(*a*) Active	PAT>ENV
(*b*) Passive	PAT<ENV

so we may consider that the patient's relations to himself may be formulated somewhat as follows: —

(*c*) Reflexive (Active)	EGO>ME
(*d*) Reflexive (Passive)	EGO<ME

The sign > in this formula obviously means many things. Thus, a patient active with respect to his environment (PAT>ENV)

may be a patient with delusions of grandeur giving a variety of orders to his *entourage*, or he may be violent and destructive in his environment. He may even, as was pointed out above, inhibit his objective activities for the moment to secure an ulterior end. The (grammatical) activity includes an almost limitless number of forms of action. The point lies in the patient's conception of his relation to the environment. So also with the sign <. A total gamut of relations may be covered by this sign, from the extreme instance of the counteractivities of the caged beast to the more ordinary phenomena of the ordinary delusion of persecution. When we come to the relations of the patient to himself, to the reflexive disorders, our difficulties multiply on account of the well-known logical pitfalls of identity and non-identity. It is not necessary to read Hegel to become aware of the difficulties of the concept "self-activity," and the concept of "self-passivity" is not less involved. Just as a normal subject fits his environment and the environment fits him approximately, so normally there is a similarly satisfactory relation between the various parts or categories of the self. We speak of self-control, of being at peace with one's self, of having settled one's own problems, of the serenity of virtue, and the like. These are examples of perfect fit between the spiritual and material selves. The doctrine of humility which prevails in Christianity possibly preaches what the youth believes to be too great a degree of self-abnegation or passivity. It is possible that our current idea of self-control is a little more than that of the Christian self-abnegation, than that of the strong man having himself well in hand. However that may be, it is safe to say that psychopaths often show degrees of deviation from what may be called the standard reflexive relation of the self to itself which are entirely convincing, and illustrate both forms of altered relation of the self to itself, namely, the active and the passive forms of reflexive disorder. What the French term *theomanias*, or forms of disease with religious exaltation, occasionally show the spiritual self in entire control of the bodily self. Psychopathic degrees of flagellation may be used as examples of this kind of disorder. Certain delusions of grandeur of a self-contained type of egoism may also illustrate the form. The passive form of reflexive condition is illustrated by a number of conditions ranging from the feeling of inadequacy of the depressed form of manic-depressive psychosis, masturbation, and the like, up to certain forms of suicide.

Enough has been said to suggest briefly the advantages of employing the "voice" distinction. The tyro in psychiatry —

and we may all lay claim to this title as we confront many of our problems — finds a great number of his cases to click into place with the use of this fourfold system of relations as formulated above. A sympathetic harmony with the patient's own attitude is attained by the examiner, whose questions become rather legitimately leading questions, the answers to which speedily betray any loss of dramatic unity which would be endangered by the patient's slipping from one of these four relations to another. The latter, indeed, happens in sundry cases of schizophrenia. If we cling, in our analysis of the lucid patient's beliefs, to what is manifest and subjective in the patient, and strive to understand the patient's behavior from one or other of these four relations, I believe a certain insight is gained which is the best preparation for more thoroughgoing factorial analysis, and for the syntheses of successful genetic work.

I turn to the equally interesting but more dubious region of the grammatical moods. At this point I may interject an explanation of my looking in the direction of the moods of grammar for psychopathological categories. As I have set forth more in detail in an article written in honor of Prof. Josiah Royce [1] for the "Philosophical Review," I had occasion to illustrate the method of Professor Royce's logical seminary by comparing the facts of one science with the classification and nomenclature of an older science. For reasons which need not concern us I chose to compare psychiatry with grammar. I had been trying to come to clearness for myself as to the topic of delusions. Finding that many, if not the majority, of delusions are not perverted ideas so much as perversions of the believing process, I was convinced that I should find more to my comparative purpose in the grammar of verbs than elsewhere. Looking through Goodwin's "Greek Moods and Tenses," I came upon traces of the old controversy about the true nature of the subjunctive and optative moods. I found, for example, that Delbrück held that the subjunctive was a mood of will and the optative a mood of wish. Knowing that much had been made of the term *wish* by several workers in the field of psychopathology, and feeling that overrationalization of the subjunctive type was the rule in other camps, I became persuaded that much might be learned from the situation in grammar of possible value in psychiatry. Not knowing much about grammar, I was *à priori* not very likely to get very far in correlations.

However, without further consideration of my reasons for effecting such correlations, I will proceed to psychiatric suggestions

drawn from the moods. It is often stated that the term *mood* is itself not so good a term as the term *mode;* exactly why the Latin term *modus* should be interpreted in English by the emotion-laden term *mood,* I am not competent to discuss. Strangely enough, however, the English term *mood* so well expresses a certain form of rhetorical situation that every educated person would clearly understand being put in, *e.g.*, the imperative mood, or perhaps the optative mood. It would be less idiomatic to speak of a person as in the subjunctive mood, although a person mulling over hypotheses would probably be the connotation of such a phase. A phlegmatic or matter-of-fact person might be described as usually in the indicative mood without undue stretching of terms. At all events, these four moods — imperative, indicative, subjunctive and optative — are apparently the four characteristic moods or modes of the best studied languages, namely, the Indo-European group. Other languages contain a variety of other variously designated moods, but we find these moods reducing as a rule to the standard four. In fact, the majority of fresh designations, such as the potential, conditional and the like, on the one hand, and the desiderative, precative (prayerful) or jussive (statements of *lux fiat* type) moods seem to flow in the direction of the subjunctive or the optative, as the case may be.

Without going into this matter at length, or justifying the idea by historical data, I may briefly say that these moods may be logically related to one another as in the following diagram of the hypothetical development of moods: —

Subjunctive — Optative

Indicative

Imperative

I have developed in my article for the "Philosophical Review" some notion of the layered development of these moods, pointing out that the child of the savage may well start with those bare stems that constitute the imperatives; that upon the layer of the imperatives may develop the matter-of-fact indicatives; and that upon this plateau the two eminences of the subjunctive and the optative develop. Science is a matter of hypothesis and employs subjunctives. Art is in part at least a matter of imagination and flourishes upon optatives. For a certain type of mind the wish is farther to the thought; optative air-castles secure the subject's happiness. The scientific or hypothetical type of mind attempts to realize itself, as it were, subjunctively. The optative person

builds, as we say, castles in Spain; the subjunctive type is gulled by the well-known "Spanish captive" hoax.

It is a curious thing that of the anciently accepted temperaments, the choleric corresponds somewhat closely with the imperative. The phlegmatic may be said to correspond somewhat with the indicative; the sanguine rather clearly with the optative. Whether the melancholic or atrabilious corresponds with the rationalistic employment of subjunctives is not at present wholly clear to me. The correlation between the temperaments and the moods is sufficiently close to be at least suggestive.

The logician might inquire why we resort to grammatical moods when we have the logical modalities at our command. These modalities, as is well known, consist of the *necessary*, the *contingent*, the *possible* and the *impossible*. It is clear that the objectively necessary corresponds somewhat closely with the imperative. It is clear that the objectively contingent and the subjunctive are closely allied. The possible and the optative are also not far removed from one another. The relation of the impossible to the indicative is not at first sight close, and only becomes so when it is developed by the logicians that the impossible is not so much the opposite of the possible as it is the opposite of the necessary; and that just as the imperative and the indicative are coupled together somewhat apart from the optative-subjunctive couple, so the necessary-impossible couple is a little apart from the possible-contingent couple. Here, again, the correlation of the fourfold systems; logical modality on the one hand, and grammatical mood on the other, is perhaps not exact, though it is decidedly suggestive.

As against a logician who should decry the use of the grammatical moods instead of the logical modalities, I would insist as above stated on the preferential use of grammatical categories for subjective situations where the truth may never be learned, and where beliefs that we regard as false the patient regards as true and upon which he proceeds to act accordingly. It may then be urged that the employment of these mood designations is an approximately exact way of expressing inexact situations.

Practically, then, I find my colleagues, although they do not accede to the mood distinction as speedily and, as it were, passively as they do to the use of the voice distinction, to some extent adopting the mood distinction. My own idea is that the degeneration, condensation, collapse or precipitation of a subjunctive into an indicative — that is, of an hypothesis into what

the patient regards as a fact — leads to a mental situation of a pretty definite complexion. Signs of pre-existent hypotheses are frequent. Elaborate argumentation is the rule, as after all, the hypothesis makers are precisely the eager disputants of the world. On the other hand, when the optative degenerates, condenses, collapses or precipitates, then again one finds evidence in the resultant indicatives of the pre-existent wishes. In the former case the subjunctive precipitate is in the form of what may be termed a pragmatic delusion or a parapragmatic belief, namely, a false belief which requires experience to determine its falsity, whereof we say, "Time will tell." On the other hand, the optative precipitate is in the form of fantastic delusions which are, as it were, *prima facie* false, that is, false, taking into consideration the context and circumstances of the patient. These latter delusions should not require the test of experience. They are not irrational beliefs or rational delusions; they are paraphantastic beliefs or fantastic delusions. I offer as a suggestion, therefore, the conception that *delusions may be descriptively classified as degenerate hypotheses, on the one hand, and as degenerate wishes on the other.* If any one desires to identify hypotheses and wishes, I shall naturally have no objection when proof is brought. The descriptive classifications of delusions would fall together at precisely such time as the distinction of hypotheses and wishes should vanish. I make no point of the ultimacy of the distinction. Whether it would not be possible to divide the characters of men along these lines, I shall not develop here.

So much for a brief statement of certain categories deliberately derived from grammar that may be of some use in the psychiatry and especially in the psychopathology of delusions. I believe that it is clear that the analytical items of person, number, sex and time, as involved in the noxious events or conditions of the delusional universe, must be of value in description. I believe that the fourfold system of possible relations of the patient to the environment, on the one hand, and of the patient to himself, on the other, each relation splitting into a pair, active and passive, will also more or less appeal to the analyst. The suggestions from the grammar of moods are somewhat more doubtful, but, to say the least, suggestive.

In a given case, how much to the point it may be to ask what degenerated hypothesis is at the bottom of this irrational belief, or, on the other hand, what precipitated wish; again, how im-

portant it may be to ask whether this patient from his own point of view is dominant in his situation or overwhelmed by it; or whether, on the other hand, his difficulties are intrapersonal and relate to disorders in the relative values of his different selves; whether he is in the seventh heaven of neglected bodily concerns, or whether he is hypochondriacally controlled by somatic factors. Again, is the first person involved alone, or are two persons involved; and is the other person involved in the dual universe conceived as in the second person, namely, as a *you*, or in the third person, as *him* or *her*. The dramatic situation is entirely different when one is *vis-à-vis* and when one is an eavesdropper. Is the situation not monadic, not dyadic, but triadic? Is this a jealousy situation, representing the so-called triangle of the novelists; or is the triangle situation always actually, as a colleague suggests, essentially tetradic in that another model is being more or less unconsciously utilized, upon which to build the actual triadic jealousy situation? All these and numerous other intriguing problems develop in the form, either of hypotheses or of wishes, on the part of the psychopathologist.

Summary.

The writer aims at a descriptive analysis of manifest delusions and false beliefs taken subjectively, *i.e.*, from the patient's point of view. He regards this as an indispensable preliminary to explanatory synthesis of psychopathic situations, even should it turn out that *aliquid latens* is the nucleus of such situations. Practically he proposes a minimum of terms which the tyro in psychiatric examination must aim to get from a lucid patient entertaining or alleged to entertain false beliefs. In addition to (*a*) the *person* or persons involved, (*b*) the *number* of persons involved, (*c*) the *sex* of these persons, (*d*) the *time*, past, present or future, in which the noxious event or condition is believed to occur, the writer deals also with (*e*) the "voice" in which the patient takes himself to be. The patient from his own point of view regards himself as at odds with the environment

(1) as it were actively
(PATIENT > ENVIRONMENT)

or (2) as it were passively
(PATIENT < ENVIRONMENT), or again as at odds with himself, either

(3) with higher (spiritual) self dominant
(EGO>"ME")

or (4) with lower (material) self dominant
(EGO<"ME").

The writer deals also with (*f*) the distinction of "mood," finding that patients above the "imperative" level entertain either irrational delusions or fantastic ones. The writer speculates that irrational (pragmatic) delusions represent hypotheses taken as facts (*i.e.*, "subjunctives" degenerating into "indicatives"), and that fantastic (*prima facie* false) beliefs represent wishes taken as facts (*i.e.*, "optatives" degenerating into "indicatives"). Possibly those who transcend the imperative and indicative levels in normal development split into two classes of persons, those with a leaning toward hypotheses (highest development, men of science) and those with a leaning toward wishes (highest development, artists). In the body of the paper some account is given of the comparative method by which these items of psychiatric analysis were obtained, a fuller account of which has appeared in the "Philosophical Review" in a paper written in honor of Prof. Josiah Royce.

REFERENCE.

1. SOUTHARD: "On the Application of Grammatical Categories to the Analysis of Delusions;" article read in honor of the sixtieth birthday of Prof. Josiah Royce at the Philadelphia meeting of the American Philosophical Association, 1916. Published in the Philosophical Review, May, 1916.

EDUCATIONAL AND PSYCHOLOGICAL ASPECTS OF RACIAL WELL-BEING.*

By Robert M. Yerkes, Ph.D.

Assistant Professor of Comparative Psychology, Harvard University; Psychologist, Boston State Hospital, Psychopathic Department.

I.

The proximately desirable, suitable, fit in human nature *versus* the ideal.

The reasonably successful, contented and socially valuable individual is easy to find and describe; the ideal individual has never been discovered and is difficult to imagine. We know in a practical way what to work against in human nature; we are less certain what to work for. But our efforts toward racial well-being should not be hindered by diversity of opinion concerning the ideal man. Tasks of the utmost importance are at hand for each of us, and we may not ignore or neglect them without violating our social conscience.

II.

Education at present strives to perfect the individual. It concerns itself with the nurture of man. It should strive also to improve human nature.

As educators we habitually and conventionally regard human nature as the proper concern of the Creator and of biologists, nurture alone being our concern. It appears that this is a socially and racially unprofitable division of interest and responsibility, and that education should promote racial well-being through the proper training of the individual.

It lies within the power of us educators to effect racial improvement. Our work reaches from generation to generation. What the children of to-day are effectively taught will — as our appreciation of the educational aspects of eugenics develops — determine in ever larger measure the quality of the next generation.

---

* Address given in New York, July 1, 1916, before the National Council of Education. Being M. C. M. D. Contribution No. 1916.9 (whole number 151). The previous contribution (1916.8, 150) was by E. E. Southard, entitled "On Descriptive Analysis of Manifest Delusions from the Subject's Point of View." Journal of Abnormal Psychology, August, 1916. Published in the Journal of the National Education Association, November, 1916, Vol. 1, No. 3, pp. 348–354; Journal of Delinquency, November, 1916, Vol. 1, No. 5, pp. 243–249.

III.

How may education most effectively promote racial well-being as contrasted with merely individual development? How may we, through educational effort, guarantee that posterity shall be well born and well reared?

Two lines of endeavor seem especially promising of good results, — first, we should educate to a sense of responsibility for the race as well as for society and for the self; second, we should educate to an appreciation of the values of research.

An ever-present consciousness of responsibility for human nature may be developed by appropriate and adequate instruction in (*a*) the sciences which deal with man's physical environment; (*b*) the science of life, — botany, zoölogy, physiology, psychology; (*c*) the study of actual and possible relations of organisms to their world, as, for example, in hygiene; (*d*) the study of the self as an organism among organisms, as a conscious and self-conscious being, as a member of social groups, and as a moral being with ideals, rights, obligations.

Such instruction should tend to give the individual fuller and more valuable knowledge of himself and his place in nature, while at the same time bringing him to feel that the future of mankind depends partly upon him. We need above all thus to increase educationally the sense of responsibility, dignity and social value in any individual. Our modern conception of heredity modifies but does not lessen man's responsibility for man.

To-day we train ourselves for almost everything in our catalogue of vocations and avocations except the tasks of parenthood. Dare we still argue that instinct adequately prepares us for this racially important and most complex group of activities? Racial well-being demands that the nature and conditions of life be made objects of systematic and intelligent instruction throughout our educational system. The kindergarten is not early enough for the beginnings; they should, if possible, be made in the home; and the college age is not too late for wise instruction in heredity, eugenics and euthenics. Where is the parent or teacher who has not keenly felt the inadequacy of his knowledge, insight and skill? Our human duties call for infinite wisdom and devotion. Truly, "the proper study of mankind is man."

Appreciation of the values of research by the child seems impossible until one considers the matter in the light of genetic psychology. Then it appears natural, inevitable and essential to

racial welfare. For the creative impulse or instinct is ever present, awaiting the command of the wise and skilled teacher. Alike in play, daily tasks, art, science and procreation it finds expression, and, indeed, tends to sweep everything before it. It cannot be wholly suppressed; it may be effectively guided. Education can ill afford to neglect either the creative tendency or the values to the individual and the race of creative endeavor and its fruits.

To educate to an appreciation of the values of research means so to direct the interests and activities of the individual that the satisfactions of originating, initiating, discovering, working out problems, adding to human knowledge instead of merely using what is offered, shall be experienced repeatedly and shall stimulate to further effort. Life offers no greater satisfactions than those of free creative activity.

Is education doing all that should be done toward racial well-being through the stimulation and guidance of the impulse to research? Are we as teachers living up to our insight and opportunity in this respect? Readily we admit that the control of life depends upon knowledge of characteristics of the world, of the organism and of their relations, but all the while we continue to regard research — and particularly scientific research — as something remote from human interest, impractical, the result of an acquired taste. Is not the search for knowledge, the creative impulse, the most natural of tendencies, which, if lacking, must have been suppressed? Surely, a little wisdom, insight, pains on the part of teachers will greatly increase the satisfaction of individuals, while so adding to our knowledge as to prepare the way for racial improvement.

IV.

Racial well-being demands also that an adequate scientific basis for the art of education be created.

Social, psychological and educational measurements have abundantly demonstrated that like tends to produce like. The educator can no better afford to ignore this fact than can the farmer, gardener, stock breeder. If we are to attain new levels of racial welfare and individual achievement we must, in the light of the facts of environmental influence and heredity, treat man educationally as an organism among organisms.

In conformity to this necessity the newer ideal of education calls for discriminating treatment of individuals in accordance

with their nature, nurture and probable value to themselves and to the race. Such discriminating and individualistic treatment can become possible only if adequately used, first, for purposes of statistical research, and second, to supply facts for diagnostic statement and educational treatment. To-day we educate — or attempt to educate — the individual while ignorant or heedless of his characteristics. What shall be true to-morrow?

Summarily expressed, the promotion of racial well-being through educational effort calls for (1) the thorough study of the individual; (2) the scientific study of methods of achieving educational ends; (3) the careful relating of educational treatment to individual characteristics; (4) the segregation of subnormal individuals and their commitment to social and medical agencies; (5) increasingly discriminating individualistic treatment of the normal or average child; and (6) special study and oversight of the supernormal or exceptional individual.

The individual should be studied by reliable methods from every significant point of view, but especially as to (*a*) family history or heredity; (*b*) individual history in home, school, etc.; (*c*) physical and medical history and status; (*d*) social relations, economic efficiency and dominant traits of temperament and character; (*e*) mental constitution; (*f*) educational needs; and (*g*) vocational fitness.

The so-called "testing" of school children, now the fashion, is a poor substitute for the kind of individual study that is needed. We must not imagine that the child is easily analyzed, measured, described. Only experts, highly trained, experienced in their special tasks, wise, are fit for the work. Incompetence is rife in the mental examining of school children to-day, and unless harm is to result where good is expected we shall have to look sharply to our methods and to the quality of our examiners.

Reliable individual study should lead to practically valuable classification with respect to mental and physical characteristics and to special educational diagnosis. Markedly subnormal children should be made the charges of social and medical agencies, not of the school system. Racial interests in this matter should not be subordinated to a blind humanitarianism. Supernormal individuals, on the contrary, should receive special attention. They should be carefully studied and taught in small groups. This is peculiarly desirable in case of certain mentally ill-balanced children.

The special attention which is now being given to the subnormal child in certain of our school systems might much more profitably be devoted to the supernormal. The former is the handicap of the race; the latter, its hope. We may not neglect our social responsibilities to those physically and mentally unfortunate beings who never should have been born, but neither should we attempt for them the impossible.

The supernormal child is supremely important, for he is almost certain to prove in marked degree a blessing or a curse to the race. More than his fellow he needs careful guidance, intelligent nurture. It is not generally known that delinquents, criminals, vagabonds, geniuses in vice, as well as our social and racial leaders, are commonly recruited from the supernormal and ill-balanced group.

V.

As a means to social progress along educational and eugenical lines the intensive study of a single school system is proposed.

The plan may be briefly outlined thus. In a fairly stable community (town, township or county) the school population should be studied systematically by a staff of experts over a period of ten to twenty years. The work should include: —

1. Careful and accurate study of each pupil, physically, mentally, socially, genetically, educationally and vocationally. Each record should be rendered as complete as possible by the co-operative labors of experts in medical, psychological, sociological and educational measurement and diagnosis. The individual records or descriptions should be supplemented from year to year.

2. So far as possible every individual should be followed up after leaving school in order that social, economic and genetic data might be obtained.

3. Finally, the varied sorts of information should be skilfully arranged for statistical use, thoroughly analyzed, and studied comparatively for the solution of varied educational, psychological and broadly social or racial problems.

Ultimately, the information from such a survey should indicate important relations of characteristics of mind, body and environment to social and economic achievement or value. A multitude of pressing problems should be illuminated if not solved. Much, for example, should be learned concerning the nature of the children who later become social blights or blessings, —

paupers, criminals, mental dependents, insane, inventors, artists, reformers, leaders in various walks of life. Much should be learned about the marriage and mating tendencies in their relations to individual traits; about the results of various sorts of matings; about the values for different natures of certain modes of educational treatment. This catalogue might be indefinitely extended, since all human problems would come within the scope of such a survey.

I submit that economy of effort in the interests of educational and eugenical progress demands the intensive and prolonged study of a human community.

Summary.

Racial well-being or eugenical progress must be achieved primarily through educational effort. It must be recognized that the interests of the individual are inseparable from those of the race; that self-realization is conditioned by a measure of subordination of individual desires to racial and social ends. As educators we must learn to work for the next generation, because by so doing we shall best serve the interests of the children of to-day. Our responsibility for the conduct of our own lives may not be lessened, but we must accept a larger measure of responsibility for posterity — even for the unborn — and for social developments. Education must at once be more highly individualized with respect to treatment; more highly socialized with respect to immediate ends; and more highly racialized with respect to its chief purpose, aim and ideal of achievement. To shape humanity is nobler than to strive toward the perfecting of the individual, and yet we must not forget that racial well-being may be achieved only by and through the development of better individuals.

METHODS OF EXPRESSING RESULTS OF MEASUREMENTS OF INTELLIGENCE: COEFFICIENT OF INTELLIGENCE.*

By Robert M. Yerkes and Louise Wood.

Ordinarily it is not very difficult to devise means of expressing the results of simple mental, social or physical measurements. But it appears that the sort of measurements which result from the application of scales for measuring intelligence are not readily expressible in strictly comparable terms. For several years group measurements of intelligence have been made by the Binet and other scales, and various means have been employed for expressing the general results. But the modes of expression have varied extremely in convenience, reliability and comparability. It is evident that at present there is no generally understood and commonly accepted statistical datum for such measurements.

Of the several modes of expressing intellectual status, the following are most commonly used: (*a*) mental age; (*b*) age-difference (retardation or acceleration); (*c*) frequency, or order of rank; (*d*) deviation from the median, mean or normal value; (*e*) intelligence quotient (sometimes improperly designated as mental quotient); (*f*) coefficient of intelligence.

As a preliminary to our consideration of certain data concerning the coefficient of intelligence we shall review the important characteristics of these six modes of statement.

(*a*) *Mental Age.* — From the practical point of view this seems the simplest and most natural way of expressing intellectual status, but its apparent simplicity is misleading, and its practical value tends to be overestimated. For, in the first place, although it is commonly assumed that the statement "mental age of ten years" (more strictly, intellectual age) has very definite meaning for most of us, inquiry indicates that it does not, and further, that even reasonably experienced psychologists, psychological examiners, teachers and parents have widely varying conceptions of the intellectual ability of the average ten-year-old boy or girl. Again, mental or intellectual age gains significance only through comparison with another age value for the indi-

* Being M. C. M. D. Contribution, No. 1916.13 (whole number 155). The previous contribution (154, 1916.12) was by E. E. Southard, entitled "The Psychopathic Hospital's Function of Early Intensive Service for Persons not Legally Insane," in Proceedings of the National Conference of Charities and Corrections, 1916. Published in the Journal of Educational Psychology, December, 1916, Vol. VII.

vidual. Most commonly used for this comparison is the so-called chronological age, or period since birth. Inasmuch, however, as rate of growth and time of maturing vary considerably in individuals, it is clear that chronological age is not a safe basis for prediction of intellectual status. Instead, what may appropriately be termed physiological age should be used. This, like the intellectual age, must be determined by carefully selected measurements.

It is, then, clear that mental age alone lacks practical value; that it gains value when viewed in relation to physiological age. It is therefore necessary to employ either instead of or in addition to the value mental age, an expression of the relation of mental age to physiological age. This has been done in many cases by determining the difference between the two ages. The statistical datum thus obtained may well be termed age-difference. Actually, age-difference has not been used alone in descriptions of intelligence measurements, but since it evidently might be, we shall consider it below as mode (*b*) of expressing results of measurements of intelligence.

(*b*) *Age-difference.* — As has already been stated, the difference between mental age and chronological age is misleading because of individual variations in growth. But even when physiological age is used instead of chronological age, a serious objection to age-difference as an index of intelligence may be offered. For the value of a given period, say a year, of mental development varies with age. The amount of intellectual development occurring in one year during early childhood is equal to that which occurs in two years during late childhood, or in four or five years during adolescence. Otherwise expressed, since the significance of the chronological unit of development varies, that unit cannot be used alone as a means of expressing intellectual status.

(*c*) *Frequency or Order of Rank.* — It is obviously serviceable to know the relative value or rank-order of a given individual's intellect. Such a value might be known as intelligence frequency, relative intelligence or simply rank. It has the advantage of indicating what may reasonably be expected of an individual in comparison with his fellows. One way to express frequency is in terms of the percentage of occurrence of a given order of intellect. Miner[1] has recently advocated the use of this device as a means of defining intellectual deficiency. Examiners would necessarily make use of statistical tables or curves of the distribution of intelligence in evaluating individual measurements.

Frequency of occurrence is unquestionably a useful datum, which should be presented if not instead of, then in addition to, certain other statistical indices which possess greater scientific value.

(*d*) *Deviation.* — It is possible, and it may ultimately prove highly desirable, to employ some form of deviation-value as a measure of intellectual status. Either the average or the standard deviation may be thus used. But it remains to be seen whether such values are in any respects superior to the ratios which are discussed below.

(*e*) *Intelligence Quotient.* — The intelligence quotient, although less widely employed by psychological examiners than mental age or age-difference, has very important advantages. These have been appreciated by those investigators who considered seriously the statistical aspects of description. Prominent among the advocates of this mode of expression are Stern,[2] Bobertag,[3] Kuhlmann[4] and Terman.[5] The intelligence quotient is the ratio of mental age to chronological age. It has been used repeatedly in connection with Binet measurements, and it should be understood that its value varies extremely with the form of the Binet method which happens to be employed. This accounts for certain adverse criticisms of the mode of expression.[6]

From what has been said, it is apparent that the intelligence quotient is the natural way of avoiding important defects of mental age and age-difference. The reliability of the quotient depends upon several variable factors, important among which are the accuracy of the measurements of intelligence and the trustworthiness of chronological age.

Stern claims that the value of the intelligence quotient tends to diminish with age. Terman maintains, in the light of data yielded by the Stanford revision of the Binet method, that it is practically constant.

It is our impression that for the expression of Binet results nothing comparable in statistical value to the intelligence quotient has been suggested, but it should be added that the reliability of the quotient will necessarily vary with the method of measurement. The Stanford revision of the Binet scale promises to yield more accurate measurements of intellectual status, and consequently more reliable intelligence quotients than does the original or any other modification of the Binet scale.

(*f*) *Coefficient of Intelligence.* — The same in principle as the intelligence quotient of the Binet method is the coefficient of intelligence of the point-scale method. This value has been termed coefficient instead of quotient because it is not directly

comparable with the Binet quotient. Were we to speak of it as an intelligence quotient, confusion would result, and from over-hasty or thoughtless critics would come ill-founded objections.

The coefficient of intelligence is definable as the ratio of an individual's point-scale score to the expected score, or norm. As in the case of the intelligence quotient, the coefficient may be expressed as a fraction. Thus for I. Q. we have $\frac{7}{10}$ to indicate that a child of seven-year intelligence is chronologically ten years old, or in decimal form the I. Q. reads .70. For the point scale, the fraction $\frac{20}{35}$ means that a child for whose age the expected score is 35 points obtains in examination only 20 points, or, expressed as a decimal, the coefficient of intelligence for the individual is .57.

What has already been said of the importance of physiological age in connection with measurements of intelligence applies with equal force to the point-scale procedure, for it is clearly unfair to expect of an individual who is physically retarded because of malnutrition or overwork the mental age appropriate to his chronological age. We are in agreement with Crampton,[7] who has presented and defended the thesis "physiological age should be taken as a basis for all record, investigation, pedagogical, social or other treatment of children." And although we have not yet been able to present physiological age norms for use in connection with the point scale, we are fully convinced of their desirability, and heartily welcome all efforts directed toward the development of serviceable methods of measuring physiological age.[8]

In the present stage of development of measurements of intelligence and of modes of dealing with them, it is highly desirable to determine, so far as possible, the practical and scientific value of the coefficient or quotient of intelligence. Kuhlmann, some years ago, clearly perceived the desirability of expressing degree of deficiency "by some mathematical relation of the mental and chronological ages." He has since argued most effectively for the use of the intelligence quotient in connection with Binet measurements. He further appreciated the importance of rate of mental development and the desirability of definite measurements thereof, but at that time he wrote, "We have at present no means of measuring this rate of progress and its changes."[9] The measurements of which Kuhlmann felt the need, the point-scale method supplies. Indeed, at the time the above sentence was written by him, we were engaged in the Psychopathic Hospital, Boston, in developing the point-scale method as a means of

measuring the rate of intellectual growth and of determining individual intellectual status.

For the safe use of intelligence coefficients of quotients it is essential to look well to the following fundamentals of method and information: (1) Reliable norms of judgment. For the point-scale method these should be physiological age-norms, by half years or smaller intervals. The Binet method also rests upon norms, but they are embodied in the structure of the scale, and are usually spoken of as the standardization or age arrangement of tests. (2) Normal distribution or frequency of measurements and of resulting coefficients or quotients. Highly reliable distribution tables and curves must be made available if our measurements of intelligence in childhood or maturity are to be reliably expressed in terms which shall render comparison both convenient and safe. (3) Correction for physiological age where chronological or other age data are regularly employed.

We have been able to accumulate, during the past three years, upward of 4,000 point-scale examinations. The data of these examinations bear so directly upon the important points which have been made with reference to modes of expressing intellectual status that we wish to present, briefly, the significant results for certain of our groups of measurements.

The total number of subjects for whom coefficients are presented below is 2,414. These fall into the following six groups: —

Pupils of Cambridge schools,	829
Pupils of Iowa schools,	166
Cincinnati eighteen-year-old group,	237
Massachusetts adult group,	50
Ohio Industrial School group,	997
Little Wanderers' Home group,	135
Total,	2,414

Of these examinations 1,282 constituted what we shall call the normal group; 1,132, the Ohio Industrial School group and the Little Wanderers' Home group, constitute a specially selected group which cannot be designated as normal.*

The coefficients were determined by use of the intellectual norms offered in "A Point Scale for Measuring Mental Ability," page 66. For age sixteen the norm 84 and for age seventeen the norm 86 were used. For all except 25 of the individuals eighteen

* We wish to express our indebtedness and heartiest thanks to Prof. R. H. Sylvester of the University of Iowa, to Dr. Helen Thompson Woolley of Cincinnati, to Dr. T. H. Haines of Columbus, and to Miss Rose S. Hardwick of the Little Wanderers' Home, Boston, for data from their respective localities or institutions.

years of age or above, the norm 88 was used; for the excepted group, a special norm of 94. Since for some of the subjects whose examinations were reported to us we know the age only to the nearest year, all coefficients were calculated without reference to fractions of a year. This introduces a very large error for young children, and one which is practically negligible for adults. We regret exceedingly that our coefficients could not have been determined on the basis of year and month age data for all subjects.

For the group of 237 eighteen-year-old children, the age-differences and the coefficients of intelligence are offered in Table 1, and as another sample of these values there appear in Table 2 the results for the group of 135 individuals examined at the Little Wanderers' Home.

TABLE 1. — *Age-differences and Coefficients of Intelligence for Eighteen-Year Group (237). Norm used, 88. Average Score for Group, 89+ (Woolley).*

MALES.			FEMALES.		
NUMBER OF CASES.	± YEARS.	COEFFICIENTS.	NUMBER OF CASES.	± YEARS.	COEFFICIENTS.
2	−8.8	.65	1	−9.9	.48
4	−8.3	.68	1	−9.7	.51
2	−8.2	.69	2	−9.0	.64
1	−7.7	.72	2	−8.6	.66
2	−7.5	.73	1	−8.3	.68
2	−7.0	.74	1	−8.2	.69
4	−6.9	.75	1	−8.0	.70
1	−6.7	.77	3	−7.7	.72
3	−6.6	.78	2	−7.5	.73
3	−6.5	.80	1	−7.0	.74
2	−6.5	.81	1	−6.9	.75
2	−6.4	.82	3	−6.8	.76
4	−6.3	.83	1	−6.7	.77
6	−6.2	.84	3	−6.6	.78
7	−6.1	.85	1	−6.5	.80
2	−6.1	.86	1	−6.5	.81
4	−6.0	.87	1	−6.4	.82
7	−5.5	.89	3	−6.3	.83
7	−5.0	.90	3	−6.2	.84
5	−4.5	.91	5	−6.1	.85
10	−4.0	.92	3	−6.1	.86
7	−3.3	.93	3	−6.0	.87
4	−2.7	.94	3	−5.5	.89
5	−2.2	.95	3	−5.0	.90
8	−1.5	.97	6	−4.5	.91
5	−1.0	.98	3	−4.0	.92
1	− .5	.99	6	−3.3	.93
6	.0	1.00	6	−2.7	.94
1	.0	1.01	3	−2.2	.95
2	.0	1.02	3	−1.5	.97
1	.0	1.03	5	−1.0	.98
3	.0	1.05	2	− .5	.99
3	.0	1.08	6	.0	1.00
1	.0	1.09	4	.0	1.01
1	.0	1.10	2	.0	1.02
			2	.0	1.03
			1	.0	1.06
			4	.0	1.07
			4	.0	1.08
			2	.0	1.10
			1	.0	1.12

TABLE 2. — *Age-differences and Coefficients of Intelligence for Little Wanderers' Home Group of 135 Children (Hardwick).*

4 YEARS.		5 YEARS.		6 YEARS.		7 YEARS.		8 YEARS.		9 YEARS.		10 YEARS.		11 YEARS.	
± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.
−2.0	.53	−4.0	.14	−4.9	.29	−4.1	.38	−.8	.83	−2.9	.54	−2.3	.63	−9.2	.11
−2.1	.55	−3.0	.44	−3.3	.39	−1.5	.73	−.2	.91	−.8	.67	−1.7	.69	−3.2	.61
-	-	−2.6	.45	−3.3	.44	−1.6	.73	−.1	.96	−1.4	.69	−1.3	.82	−2.1	.85
-	-	−1.9	.57	−2.8	.46	−1.3	.76	−.1	.98	−1.3	.77	−1.3	.89	−1.6	.88
-	-	−1.2	.71	−2.6	.51	−1.1	.81	+.9	1.33	−.8	.81	−.5	.95	−1.5	.91
-	-	−1.0	.77	−2.5	.53	−.6	.89	-	-	−.8	.81	−.5	.97	−.2	.96
-	-	+1.3	1.31	−2.1	.58	-	.97	-	-	−.7	.86	+.1	1.00	-	1.00
-	-	-	-	−1.5	.69	+.6	.90	-	-	−.5	.88	+.4	1.02	+.5	1.09
-	-	-	-	−1.3	.74	-	1.00	-	-	−.5	.89	+1.4	1.16	+.1	1.10
-	-	-	-	−1.0	.76	+.3	1.06	-	-	−.7	.90	+2.0	1.21	+1.6	1.13
-	-	-	-	−1.0	.77	+1.4	1.36	-	-	−.6	.94	-	-	-	-
-	-	-	-	+1.4	1.26	+1.4	1.45	-	-	−.5	.95	-	-	-	-
-	-	-	-	+1.5	1.33	-	-	-	-	+.1	.96	-	-	-	-
-	-	-	-	+1.2	1.21	-	-	-	-	-	.98	-	-	-	-
-	-	-	-	-	-	-	-	-	-	+4.2	1.46	-	-	-	-

TABLE 2. — *Age-differences and Coefficients of Intelligence for Little Wanderers' Home Group of 135 Children (Hardwick)* — Concluded.

12 YEARS.		13 YEARS.		14 YEARS.		15 YEARS.		16 YEARS.		17 YEARS.		18 YEARS.		19 YEARS.	
± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.	± Years.	Coefficients.
−8.8	.39	−6.9	.38	−5.3	.70	−4.2	.82	−6.7	.68	−7.5	.67	−9.0	.62	−6.5	.80
−2.2	.79	−3.5	.78	−2.6	.87	−3.3	.85	−4.4	.73	+.3	1.01	−7.1	.72	−6.4	.81
−3.0	.79	−3.6	.78	−2.3	.90	−3.1	.90	−4.9	.79	+.7	1.03	−7.0	.75	−4.0	.92
−.9	.89	−2.0	.82	−2.1	.90	−1.6	.99	−3.1	.93	–	–	−6.7	.78	–	1.07
–	.99	−2.2	.83	−2.0	.95	+.7	1.05	+1.2	1.02	–	–	−4.5	.90	–	–
+1.8	1.05	−1.3	.91	−1.5	.98	+1.0	1.05	+1.4	1.05	–	–	−.9	.97	–	–
+3.5	1.12	−1.1	.92	−.3	.99	+.6	1.06	+2.0	1.08	–	–	+.2	1.01	–	–
–	–	−1.8	.93	+1.2	1.05	+1.3	1.11	+1.5	1.09	–	–	–	–	–	–
–	–	−1.6	.95	+2.2	1.10	+1.5	1.15	+1.5	1.13	–	–	–	–	–	–
–	–	+2.5	1.08	–	–	+1.5	1.15	–	–	–	–	–	–	–	–
–	–	+4.4	1.23	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE 3. — *Distribution of Coefficients of Intelligence for Normal Group (1,282 individuals).*

COEFFICIENTS.	AGE BY YEARS.								
	4 and 5.	6 and 7.	8 and 9.	10 and 11.	12 and 13.	14 and 15.	16 and 17.	18 and on.	Totals.
.25 or less, . .	–	–	–	–	–	–	–	–	–
.26– .50, . .	4	6	3	–	2	–	–	1	16
.51– .60, . .	4	7	10	1	1	1	–	1	25
.61– .70, . .	4	15	13	7	3	3	–	16	61
.71– .80, . .	8	26	21	15	10	3	–	31	114
.81– .90, . .	10	36	25	23	12	8	–	68	182
.91–1.00, . .	8	49	31	39	22	24	2	109	284
1.01–1.10, . .	7	45	37	33	40	17	1	55	235
1.11–1.20, . .	10	55	25	21	23	16	–	3	153
1.21–1.30, . .	6	46	19	16	4	3	–	–	94
1.31–1.40, . .	6	27	9	4	2	2	–	–	50
1.41–1.50, . .	6	21	3	2	1	–	–	–	33
1.51–1.75, . .	9	19	–	–	–	–	–	–	28
1.76–2.00, . .	–	4	–	–	–	–	–	–	4
2.01–2.25, . .	2	1	–	–	–	–	–	–	3
2.26–2.50, . .	–	–	–	–	–	–	–	–	–
Totals, . .	84	357	196	161	120	77	3	284	1,282

The distribution of coefficients for the 1,282 subjects included in the public school groups, the eighteen-year-old group and the Massachusetts adult group appears in Table 3. The most important facts of this distribution are, first, the diminishing range of coefficients with increasing age; and second, the relative uniformity of range for the years eight to thirteen. This table, in conjunction with our experience in using the point scale, convinces us that the original or preadolescent point scale, whose data alone are used in this paper, is not satisfactory for young children. It possesses maximal value for the ages seven or eight to twelve or thirteen; it is markedly unsatisfactory for the ages four and five; reasonably reliable for the ages six and seven and above thirteen.

Terman has stated, as an argument in favor of the intelligence quotient, that for his examinations the range of the quotients is practically constant from four years to fifteen years. We should

not have predicted this constancy of range any more than we should have predicted for the coefficient of intelligence a marked decrease in range with increasing age. Evidently, however, the reliability of our coefficient and its value for purposes of comparison are conditioned by characteristics of range. It should be noted that precocity has much greater influence early than late in intellectual development. Indeed, our own data show that a few months' difference in age will alter the coefficient of a five or six year old child by 10 to 30 per cent.; of the adult, by 5 to 10 per cent. Table 3 makes it appear that extraordinary intellectual ability is fairly common up to eight years of age, and then becomes very uncommon.

TABLE 4. — *Intelligence Classification according to Coefficient of Intelligence.*

[Based upon the data for 1,282 individuals, ranging in age from four years to maturity.]

Coefficients.	Name of Class.	Frequency (Per Cent.).
.50 or less,	Dependent,	1.25
.51- .70,	Inferior,	6.96
.71- .90,	Subnormal,	23.09
.91-1.10,	Normal,	40.48
1.11-1.30,	Supernormal,	19.27
1.31-1.50,	Superior,	6.47
1.51,	Genius,	2.73

On the basis of the facts of distribution indicated by Table 3, we have made a tentative classification of intellectual ability. This is presented in Table 4, in which are to be found seven classes, ranging from the intellectually dependent to the intellectual genius. For each of these classes the range of coefficients is indicated, and the frequency or expectation in percentage terms as determined by the distribution of 1,282 normal-group coefficients. Because of the excessive variations in range exhibited by Table 3, we have presented, in Table 5, the frequency of these seven groups of coefficients for 477 normal-group coefficients obtained from subjects whose chronological ages ranged from eight to thirteen years.

TABLE 5. — *Intelligence Classification according to Coefficient of Intelligence.*

[Based upon the data for 477 individuals, ranging in age from eight to thirteen years.]

COEFFICIENTS.	Name of Class.	Frequency (Per Cent.).
.50 or less,	Dependent,	1.05
.51– .70,	Inferior,	7.34
.71– .90,	Subnormal,	22.22
.91–1.10,	Normal,	42.35
1.11–1.30,	Supernormal,	22.64
1.31–1.50,	Superior,	4.40
1.51,	Genius,	–

We suggest this classification for certain practical purposes, hoping that it may be tried out in comparison with social measurements in order that we may determine with increasing definiteness the frequency of these significant levels of intellectual ability.

TABLE 6. — *Distribution of Coefficients of Intelligence by Years, for Little Wanderers' Home Group (Hardwick).*

COEFFICIENTS.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Totals.
.25 or less, . . .	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	2
.26– .50, . . .	–	2	4	1	–	–	–	–	1	1	–	–	–	–	–	–	9
.51– .60, . . .	2	1	3	–	–	1	–	–	–	–	–	–	–	–	–	–	7
.61– .70, . . .	–	–	1	–	–	2	2	1	–	–	1	–	1	1	1	–	10
.71– .80, . . .	–	2	3	3	–	1	–	–	2	2	–	–	2	–	3	1	19
.81– .90, . . .	–	–	–	3	1	6	2	2	1	2	3	3	–	–	1	1	25
.91–1.00, . . .	–	–	–	2	3	4	3	3	1	4	3	1	1	–	1	1	27
1.01–1.10, . . .	–	–	–	1	–	–	1	2	1	1	2	4	4	2	1	1	20
1.11–1.20, . . .	–	–	–	–	–	–	1	1	1	–	–	2	1	–	–	–	6
1.21–1.30, . . .	–	–	2	–	–	–	1	–	–	1	–	–	–	–	–	–	4
1.31–1.40, . . .	–	1	1	1	1	–	–	–	–	–	–	–	–	–	–	–	4
1.41–1.50, . . .	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	2
Totals, . . .	2	7	14	12	5	15	10	10	7	11	9	10	9	3	7	4	135

In the group of 135 individuals examined at the Little Wanderers' Home there appear, as Table 6 indicates, an unexpectedly large percentage of subnormal and inferior individuals. Prior to the analysis of our data we had assumed that this group of children should be classified as normal, but by comparison with the public school groups they are so inferior that it is necessary to deal with the results separately or in connection with the industrial school group. For this group, and likewise for the industrial school group, as it appears in Table 7, age range is favorable to the coefficient, for the distribution under the several ages is reasonably constant.

TABLE 7. — *Distribution of Coefficients of Intelligence for Ohio Industrial Schools Group (Haines).*

COEFFICIENTS.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	Totals.
.25 or less, . .	–	–	–	–	–	–	1	–	–	–	1
.26– .50, . . .	1	–	1	1	3	7	6	1	2	–	22
.51– .60, . . .	–	2	4	11	19	9	8	12	3	1	69
.61– .70, . . .	1	3	1	9	19	25	12	28	16	2	116
.71– .80, . . .	1	5	10	16	28	53	38	43	24	2	220
.81– .90, . . .	4	6	12	18	32	49	44	38	18	1	222
.91–1.00, . . .	3	8	10	14	24	48	54	45	20	–	226
1.01–1.10, . . .	–	3	1	7	13	24	26	18	17	–	109
1.11–1.20, . . .	2	2	–	1	2	3	1	1	–	–	12
Totals, . .	12	29	39	77	140	218	190	186	100	6	997

Since we are primarily interested in developing a method of expressing intellectual ability which shall be at once convenient and reliable and render possible direct comparison of measurements on different subjects, it is pertinent to consider here the relations of age-difference to coefficients of intelligence. It has long been recognized that a year of intellectual retardation or acceleration has widely varying values. Our data enable us to express this relation somewhat more exactly than has heretofore been done.

TABLE 8. — *Approximate Age-difference Equivalents of Point-scale Coefficient .70 for Various Ages.*

AGE (YEARS).	Age Difference (Years).	Coefficient.
5,	−1.0,	.70
6,	−1.3,	.70
7,	−1.5,	.70
8,	−2.0,	.70
9,	−1.3,*	.70
10,	−2.0,	.70
11,	−2.5,	.70
12,	−3.2,	.70
13,	−4.0,	.70
14,	−4.8,	.70
15,	−5.6,	.70
16,	−6.5,	.70
17,	−7.4,	.70
18,	−8.0+,	.70

* The norm for nine years is inexact.

For the coefficient of intelligence .70, which we accept as the upper limit of intellectual inadequacy or inferiority, the age-difference equivalents for the ages five to eighteen years have been calculated and are presented in Table 8. At five years of age this coefficient represents a retardation in intellectual development of approximately one year. At ten years of age it represents a retardation of at least two years, and so on, until at the age of eighteen years it is equivalent to a retardation of approximately eight years. In view of this varying relation of coefficient to age-difference it is eminently undesirable to continue to use the age unit as a means of expressing intellectual status.

A graphic representation of the relation of coefficient to age-difference appears as Fig. 1.

The point-scale method has the merit of indicating directly the rate or annual increments of intellectual growth. We do not claim for our measurements a high degree of accuracy, especially in case of the early years of childhood. But even the roughly determined curve of intellectual growth from four to eighteen years, which we present below, has considerable interest for the genetic psychologist and for the psychological examiner. We

have ascertained that whether measured by the ratio of the increment of increase, year by year, to the norm for the appropriate year, or by the ratio of the extreme range of scores to

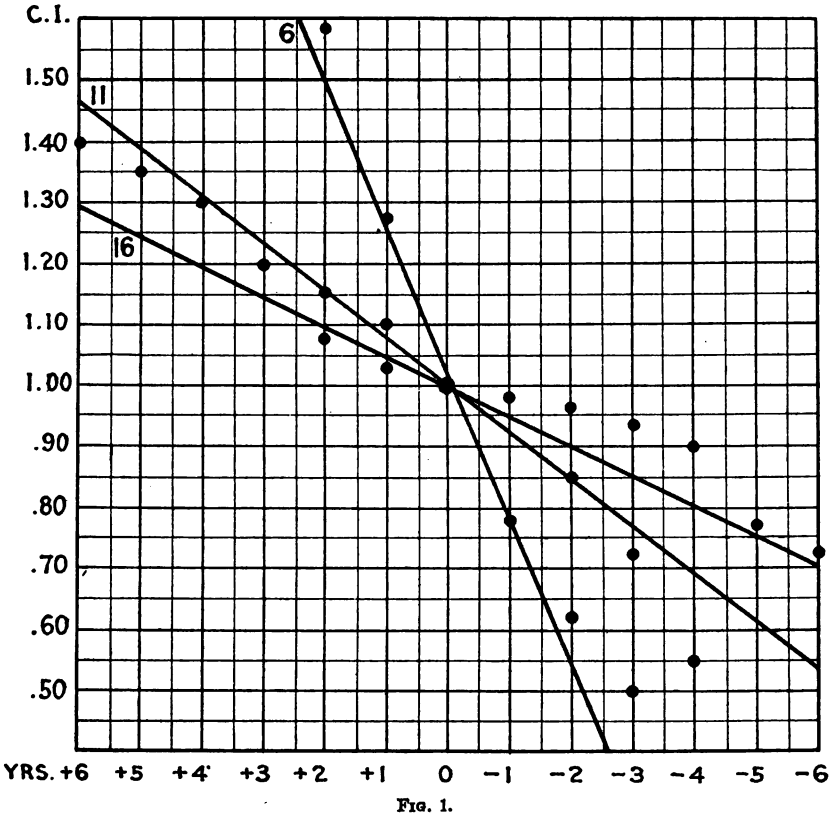


Fig. 1.

appropriate year norms, intellectual development rapidly diminishes in rate, at least from the fifth year onward. This is shown by the curve of Fig. 2.

During the fourth year of life intellectual ability (always understood as measured by the point-scale) increases by more than 50 per cent.; during the fifth year of life, by scarcely more than 30 per cent.; during the seventh year, by approximately 15 per cent. It then develops less rapidly until in the thirteenth year it increases by only about 5 per cent. Our results further indicate that between sixteen and eighteen years the increase is slight and irregular, ceasing almost entirely at about eighteen years.

The application of a carefully constructed point scale to thousands of non-selected individuals evidently would yield most valuable information concerning psychogenesis, for curves might be plotted not only for examination scores but for measurements of particular functions. In this respect the point-scale method as an instrument of research has great superiority over the Binet age-grade method.

The data of Table 8 and those upon which Fig. 2 are based suggest an important reason for the greater range or variability of coefficients in early childhood than in adolescence. During

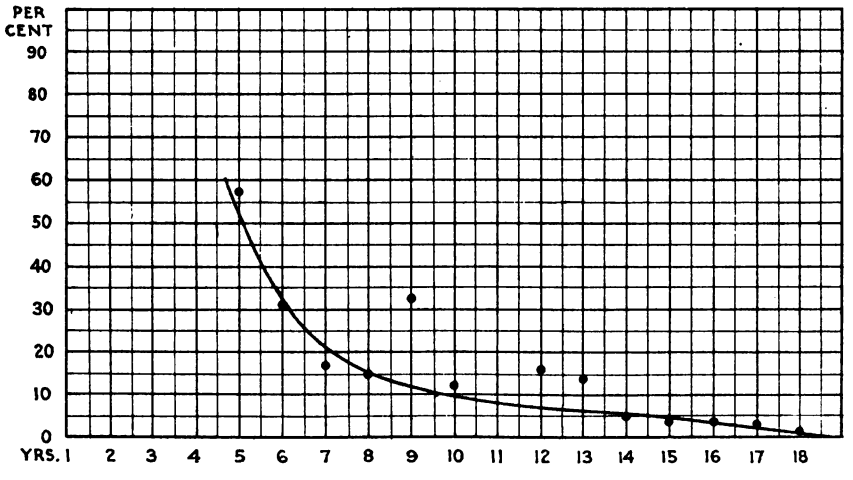


FIG. 2.

the earlier years intellectual ability is increasing very rapidly and any discrepancy between physiological and chronological age or any slight advantage or disadvantage in the conditions of mental measurement, would naturally affect the score or coefficient of intelligence markedly, altering it by 10, 20, or even 30 per cent. For a single case we present the coefficients figured, first, without respect to year of age; second, with reference to exact age. A child five years, six months of age obtained a score of 45 points. The norm for the age five years is 22 points. The coefficient of intelligence is therefore 2.05. For this individual, when months as well as years are taken into account, the appropriate norm is 26 points instead of 22, and the resultant coefficient of intelligence, 1.81.

The norms for point-scale measurements, as originally published in "A Point Scale for Measuring Mental Ability," are undoubtedly inaccurate. This is due partly to the small number of individuals in each age-group and partly to the unsatisfactoriness of the arithmetical mean as a norm. Since the norms were first published, thousands of examinations have been made by the method, and we have had opportunity to make various corrections. Unfortunately, our materials have been rather heterogeneous, and we are still unable to present a continuous series of age norms based upon comparable non-selected cases

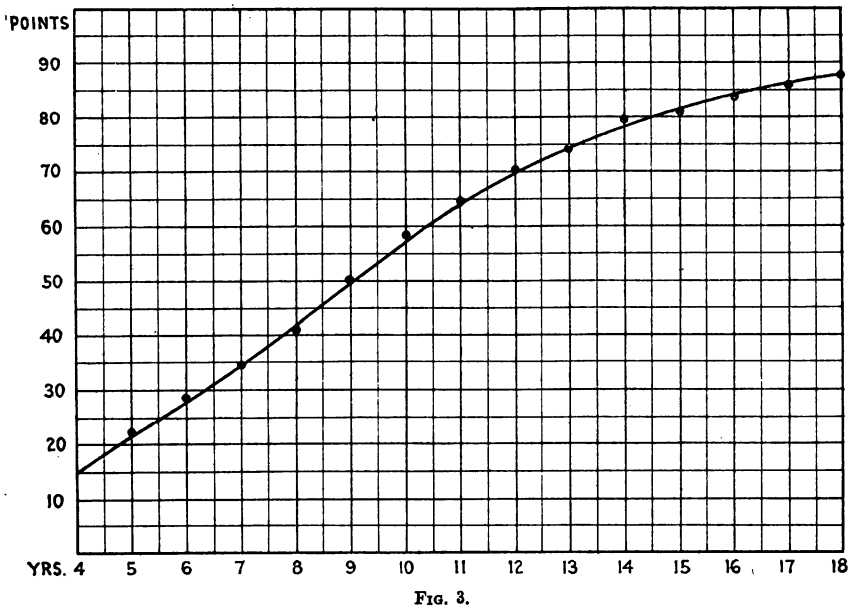


FIG. 3.

with supplementary information concerning deviations and probable errors. But despite the statistical shortcomings of our data, we deem it worth while to present herewith a new curve, (Fig. 3) of point-scale norms ranging from four to eighteen years. Certain of these norms will doubtless have to be revised later, but we unhesitatingly recommend the present curve for English-speaking subjects as contrasted with the corresponding curve of the point-scale book.

Applications and Recommendations.

The coefficient of intelligence (quotient) is the most valuable mode of expressing results of mental measurement at present available, and should, therefore, be used. Physiological age and norms appropriate thereto should be used as possible, instead of chronological age and the norms based upon the same. Frequency or rank is practically significant and should be stated. "Mental age" and age-difference as now employed are eminently unsatisfactory, and should be abandoned as statements of intellectual status.

We recommend that the classification proposed in this paper be checked against social and economic measurements of individual efficiency, and that the range of coefficients for the seven grades of intellect in our classification be adjusted to agree closely with expectation of performance in practical situations. Our data indicate that grades of intellectual ability measured by the coefficient .70 or less are socially burdensome, ineffective and usually a menace to racial welfare.

REFERENCES.

1. Miner, J. B.: "A Percentage Definition of Intellectual Deficiency." The Psychological Bulletin, 1916, Vol. 13, p. 89.
2. Stern, William: "The Psychological Methods of Testing Intelligence" (English translation). Baltimore, 1914, pp. 36–42.
3. Bobertag, O.: "Uber Intelligenzprüfungen." Zeitschrift für angewandte Psychologie, 1912, Vol. 6, p. 531.
4. Kuhlmann, F.: Journal of Psycho-Asthenics, 1913, Vol. 17, p. 132.
5. Terman, L.: "The Measurement of Intelligence." Boston, 1916, p. 65.
6. Doll, E. A.: "Note on the Intelligence Quotient." The Training School Bulletin, 1916, Vol. 13.
7. Crampton, C. Ward: "Anatomical or Physiological Age versus Chronological Age." The Pedagogical Seminary, 1908, Vol. 15, p. 230.
8. Baldwin, Bird T.: "A Measuring Scale for Physical Growth and Physiological Age." The Fifteenth Year Book, Part I, National Society for the Study of Education, 1916, pp. 11–22.
9. Journal of Psycho-Asthenics, 1913, Vol. 17, p. 136.

SPINAL FLUID SUGAR.*

By J. B. Rieger, S.M., and H. C. Solomon, M.D., Psychopathic Hospital, Boston.

Estimations of the reducing sugar content of the spinal fluids of 124 male, and 51 female subjects, in the main, psychopathic, gave values ranging from 0.050–0.090, or a grand average of 0.070 per cent. The extremes, obtained in certain diabetic and inflammatory conditions, are not here included. In general, the higher values have always been found in the more robust subjects, and aside from this, the range is the same in the psychopath as in the non-psychopath, in the male as in the female, and in the young as in the old.

The diagnoses made on these subjects are: general paresis, 47; dementia præcox, 30; alcoholism, 22; manic-depressive insanity, 12; epilepsy, 6; diabetes, 6; juvenile cerebrospinal syphilis, 4; adult cerebrospinal syphilis, 5; arteriosclerosis, 4; pellagra, 2; tubercular meningitis, 1; hypopituitarism, 1; chorea, 2; tabes, 4; miscellaneous psychoses, 20; not insane, 10. On this basis the following values are remarkable: diabetes, 0.134–256 per cent.; pellagra, 0.90–0.102 per cent.; two of the more severe cases of cerebrospinal syphilis, 0.044–0.48 per cent.; tubercular meningitis, 0.026 per cent.

Mestrezat[1] similarly reported low sugar values in the spinal fluids of individuals in whom there existed acute inflammatory processes of the meninges, and this circumstance he explained by assuming that the sugar in such cases is the substrate of the bacterial metabolism. That the values are uniformly high in general paresis, as reported by the same observer, could not be corroborated. Likewise, the figures 0.126–0.212 per cent., obtained by Mott[2] in eight miscellaneous psychopathic cases, mostly dementia præcox, in all probability can be ascribed to faulty technic.

The Bang micro-reduction method was at first employed, but owing to the wide fluctuations in the results obtained, it was

* Being M. C. M. D. Contribution, 1916.14 (whole number 156). The previous contribution (1916.13, 155) was by H. M. Adler entitled "A Psychiatric Contribution to the Study of Delinquency," appearing in Journal of Criminal Law and Criminology. Read at the Third Annual Conference on Medical and Social Work, June 18, 1915. Reprinted from the Boston Medical and Surgical Journal, Vol. CLXXV, No. 23, p. 817, Dec. 7, 1916.

abandoned for the Lewis-Benedict method, which proved more accurate in the hands of the authors. The fluids were obtained by lumbar puncture of the living subject.

REFERENCES.

[1] Le Liquide Cephalo-Rachidien, 1912.
[2] Lancet, 1910, ii.

AN OUTLINE OF THE ELEMENTS AND TREATMENT OF STAMMERING.*

By Anne Bradstreet Stedman, Brookline, Mass.

It is hardly necessary nowadays to state the general cause of stammering. With the exception of cases of structural defect, stammering is of purely mental origin. Defined, it is the expression in faulty speech of the neurotic temperament. Whether acquired or inherited, it is always there. There are no phlegmatic stammerers.

Therapy, therefore, must be based on this fact. It is the theory of some (Apelt among them) that a cure can be effected only by working from the inside out, that is, by giving all the attention to the frame of mind when speaking. Another method, practiced by many teachers who are not physicians, disregards the mental element almost entirely; calls stammering a habit and approaches it through vocal exercises only — from the outside in.

It is true that stammering is largely a habit, and that cases have been found where it still persisted, even after the nervous condition had been eased, simply because the method of speaking, practiced through a lifetime, had become mechanical. Also, in the case of children, the growing discouragement and accumulating fears can often be cut short by curing the habit alone.

But neither of these instances is drawn from the majority of cases by any means. Few can be so easily dismissed. The man with an obsession for zigzagging down the street in order to touch every lamppost does not need lessons in walking through a meadow. He knows as much about walking as his instructor. Just so, the stammerer can produce perfectly normal consonants and vowels *when unembarrassed.* Practical treatment of the habit, vocal exercises, etc., are only half the battle. The treatment must go deeper, until it reaches the fear — the emotional disturbance that occurs under trying circumstances between the thought and its expression.

It is here that the training of a neurologist is required. Com-

* Being M. C. M. D. Contribution, No. 1916.15 (whole number 157). The previous contribution (1916.14, 156) was by J. B. Rieger and H. C. Solomon, entitled "Spinal Fluid Sugar," Boston Medical and Surgical Journal, Dec. 7, 1916. From the Out-Patient Department of the Psychopathic Hospital, Boston.

paratively few specialists in speech defect are physicians, while the lay teachers and so-called professors are legion. And yet stammering is as truly the province of the neurologist as any other nervous affection.

When, therefore, a layman undertakes to treat stammering, the field narrows for him. To reach the mental side of his case, he has to rely solely on the personal touch. He must be the patient's friend. The ideal plan is to go to the patient's home, walk with him; if a child, play with him; and if the patient is in school, interest the teacher of his grade in him. The recitation in school is nearly always the hardest thing a child has to contend with, and unless it is plainly too much for him he has to put up with it for the sake of his standing. But it is the duty of the speech instructor to see just how much strain a child can bear, and whenever necessary, to get him excused from reciting until, with the treatment he is receiving, the ordeal shall have become less dreadful. Often, to tell a child who is constantly bracing himself for difficulties, that he need not do the things he dreads, is followed by surprise, gradual relaxation and a new perspective, which is a great help to normal speech. In the same way other obstacles in the daily life of the patient can be surmounted.

In a public clinic this ideal plan is less feasible, and other means have to be found. In order to link the teacher's office (where, after the first, the patient finds himself very much at home) with the outside world, that is full of difficulties for him, the speech class is the next best thing.

Class treatment alone is usually most shallow. In every case it should accompany individual attention. But individual treatment, pure and simple, is apt to be too encouraging. Everything is not overcome, by any means, after the patient has learned to speak perfectly when alone with the teacher, whereas his speech in class is a pretty good indication of his progress at home.

In the speech class there is also the benefit to a reserved, rather lonely patient of contact with others, some of whom are more afflicted than he is himself. He discovers that his difficulties are shared; that, after all, it is possible to treat quite naturally the defect about which he had kept tensely silent all his life.

Then there is the opportunity in a class of this kind of reproducing everyday situations. It is not like a class in school. It is

more informal and flexible. Everything is encouraged that tends to put the patient in a normal setting. The routine speech exercises of the teacher's office are here put into practice through story-telling, debate, and games that require conversation. No one joins the class until he is quite willing, and the most shy soon grow to like it.

It is of course, more difficult to converse naturally in company on interesting subjects than to read or recite before one person, and patients whom the teacher has considered greatly improved frequently do less well when put into the class. There are also degrees of difficulty in class work. Making a prepared speech or joining in a formal debate is usually the hardest thing for every one. In some cases patients who had been speaking perfectly for months, when called upon to stand up and debate, lost complete control. Such occurrences, instead of being discouraging, are the teacher's opportunity. They show the weak spot in the patient's progress, and improvement from then on, though frequently hard won, is no longer superficial.

As to the elemental speech exercises, on which all such work is based, the methods used are various. They include many principles of singing, elocution and phonetics, the most practical of which aim to correct a monotone by means of inflexion; rapid, nervous speech, by exercises in slowness; faulty breathing and misuse of speech muscles by training in breath control, relaxation, etc.

Unfortunately, these exercises have all to be overseen by the instructor. A patient cannot work upon them profitably at home. There is little result even when rules are followed quite conscientiously, because the patient is alone at the time, and those who stammer when alone are the rare exceptions. What he can do, and what has to be emphasized continually, is to use the newly acquired speech every day to every one, just as he does in the clinic. If he does not slip into it easily, he should keep steadily at it until it becomes mechanical; but not every one has the character to do this.

In one sense, of course, the "character" of the patient plays a large part in his recovery. But the word is often misunderstood. Will, perseverance, ambition are essential in the majority of cases. They make up the final third when a patient has been brought two-thirds of the way towards normal speech. But, as with other nervous cases, the stammerer is sometimes misjudged and thought to "give in" to his infirmity; whereas it is

not a "trick" to be overcome by "trying." A change has to be brought about in the patient's attitude of mind; something has to relax, to let go before the force of ambition can even be appealed to. There are weak natures and careless ones, but my observation does not point to any greater lack of character on the part of stammerers than of any other class of people. Character — moral force, that is — is not synonymous with mental make-up, and it is the stammerer's mental make-up, for which he cannot be held responsible, which is at the bottom of his trouble. Cure the habit, but cure the mind as well.

THE GENESIS OF A PARANOIC STATE: DELUSIONS OF PERSECUTION BASED UPON A CHARACTER DEFECT IN VOLITIONAL EQUIPMENT.

By Thomas H. Haines, Ph.D., M.D.

Clinical director of the bureau of juvenile research, and professor of medicine (nervous and mental), ohio state university.

The patient in question is an exceptionally large and robust looking male, thirty-four years of age; weight, 165 pounds; height 6 feet. Admitted to the Boston Psychopathic Hospital July 15, 1913. He came willingly to the hospital upon the advice of his brother and sister. For a year previous he had been living *alone* in an old family home in a small Massachusetts town. From this retreat he had issued letters and post cards which threatened the safety of an elderly gentleman, the father of a school chum of the patient.

Physically he presented very few points worthy of notice. He had a rather short upper lip and a thick nasal septum. No abdominal reflex was obtained on the right side. Patellar reflexes were very active, but equal. Achilles reflexes both present, but unequal: right very sluggish; left, active. Serum yielded a negative Wasserman reaction.

Mental examination showed the memory intact and quite normal for recent and remote events, except where the order and significance of events was twisted by his delusion-forming tendency. Retention and the control of his voluntary recollections were proved by his statement of the *pons asinorum*, and his demonstration, without drawing, of the proposition that the three angles of a triangle are together equal to two right angles. He shows no evidence of having hallucinations. Emotionally, he seems of an easy-going, optimistic temperament. He takes most kindly to close confinement in the institution. He is modest and unassuming. Shows no exaggerated sense of his own importance in conversation or act. He is rather changeable in his attitude and purposes. He finds the care-free life of the institution quite to his liking. He is easy and natural in his relations with physicians and patients. He busies himself with pen-and-ink decorative work in which he exhibits considerable artistic talent and some quaint conceptions. He supplied much of the organizing energy and the ideas for a minstrel show which the patients carried off. He has no insight into his delusions. In these his pathology seems wholly to consist. They are entirely of a persecutory nature.

The patient was the fourth born of five children, four living, of whom two were older than the patient. All of the other three

robust and well. The third-born died at one year of age. His father died at sixty, of "angina pectoris," and his mother at fifty-four, of "severe cold and pleurisy." A brother of the mother was a wanderer. He went to Greenland as a young man, and had expensive habits, such as keeping a four-in-hand. Later he settled down to the curatorship of a museum, married and had four children.

Early History of the Patient.

The patient, his younger brother says, was *peculiar* as a child. He was sensitive, easily upset and had little control of his temper. When twelve years of age, one brother having offended him, the patient crept up behind him stealthily and crashed the coal shovel down upon his head. He had no use for games, was never athletic or interested in contests of any sort. He played only when forced to do so. He was always *starting things*. He was full of new-born enthusiasms. But after a movement was launched it would be found the launching party was not aboard. He would be found already starting something else. His brother says, "he hated to finish things." He was very *erratic* in his school work, had strong likes and dislikes, but his good intellectual acumen served to bring him through when the test came. He was always a *collector*. Even as a child he was *introspective*, often asking what could be the meaning of one remark or another which others had made. It was a morbid introspection for a child. His father decided, while he was yet a child, that it was *useless to endeavor to convince him*. He therefore, ceased to worry about the boy's wrongdoings, for he had concluded he could not be influenced by argument.

He attended private schools in an eastern city. He entered a medical school and went through the midyear examinations of the first year, but he "fell so low in his general averages that he was not allowed to take the final examinations in the year's work." Here we see again a falling off of his initial interest, — his *lack of tenacity of purpose*. He then worked six months, under a $10,000 bond, as cashier for a trust company. He was then a confidential clerk for the heads of a firm of anchor chain manufacturers. He held this position from 1899 to 1905, rising to a salary of $1,500.

In 1903, when twenty-four years of age, he became engaged to a girl at whose home in the country he had spent a great deal of his *leisure* time, and to whom he was apparently much

attached. During the courtship he had one day wired his brother-in-law for $500, without any statement of the situation or why he wanted the money. His explanation afterward was that the girl had a wealthy suitor who had horses, and he suddenly concluded he must have a horse to keep pace and to stand any show in the competition. When this conclusion was reached in his mind a letter was entirely too slow. He must have a horse by telegraph. It was impossible to support such a wife as he was to marry upon $1,500 a year. It seemed equally impossible to work up his earning power to the needed point with his employers. This situation meant to his peculiar mental constitution, "Throw it all up," instead of the ordinary human way of holding to what he had until a better turned up.

The Patient breaks with Himself.

His inadequacy to life's exigencies showed itself in this reaction. He left his place. He depicts his own state of mind thus: "The girl was the only thing, and I needed more money." His brother says he was at this time full of get-rich-quick schemes. He had a new anchor chain, which seemed to him likely to revolutionize the industry. But he could get no one else to see it as he did. He schemed to go into the printing business, without experience and without capital. He doubtless thought he saw his way when he left his job. But, whatever it was, the plan proved visionary. He broke his engagement, as he considered this was the only honorable thing to do, — to release the girl, in view of his failure to make good. He did have an excellent offer from another manufacturing concern. Could he have made good in this he would have been able to marry. He tried it, but said, "I was not mentally able for it. I could not keep my mind on my work. I had just broken my engagement and my mind was wandering. I could not pay attention to the work. I was more than blue. I was almost distracted." Now either this is irrational, for the means of making good and supporting the girl was in his hand, or there is some ulterior element in the case not yet stated.

This further element we shall see as we proceed, and it is groundless and irrational, but that does not matter for our patient. It was one of the most real of eternal verities for him at that time. He was very much discouraged with himself. He says he was more than blue, but never had any idea of suicide. His idea was rather to get away. He tried to think it all over

and decided to do the natural thing, that is, to get clear away somewhere and do the kind of things that were interesting to him, that is, do work in the line of natural history. He had always been a collector of natural history specimens.

He made no unseemly haste after breaking the engagement. He sailed Aug. 25, 1905, as passenger on a sailing vessel for Japan, expecting to be seven months on the sea. He had letters to Governor Forbes of the Philippine Islands, hoping to get into the scientific work there, and planning a scientific expedition into New Guinea as an ultimate object. He had a fist fight with the captain after they had been at sea several months, and was relieved to get free of the craft in Tokio.

Emergence of Ideas of Persecution.

He soon went to Manila and began his efforts to get a post in one of the scientific bureaus. He says he wanted to study fish and fisheries, and they put him to work teaching natives in an intermediate school. He taught hat weaving, geography and about fish and fisheries. He insists that his persecutions began at this time, about May, 1906. The persecutions took the form, first, of not getting the job he wanted; then of being amid petty jealousies within the school, the school being in a turmoil all the time, there being only four positions, but eighteen different teachers during the year; and finally of having the natives alienated from him during the last part of his time there. These were his reasons for his unhappiness, stated upon a cursory review of the situation.

Getting into the matter one finds that the thing which troubled him most was that word was spread by his enemies wherever he went that he was a "moral degenerate." He was never directly told that he was so accused, but he knew, from their actions, that many about him knew of it. He himself defines *degenerate* as "not having natural desires and feelings, — as not being credited with having instincts of an ordinary man." He found himself accused of being unable to have sexual intercourse. He says he knew from experience this was not true. Still, he must disprove it afresh. In his attempts to disprove this accusation by visiting the tenderloin district in Manila, he found, from noises he heard in neighboring apartments, that he was shadowed by his enemies. This knowledge injected a psychic element into the situation, and he was unable to complete the sexual act. This occurred repeatedly. On one occasion, with a razor in

hand, he threatened some persons whom he thought had been spying upon him. There seems an hallucinatory contribution to his persecutory beliefs in his account of these experiences and in his realistic threats. Further contribution to his troubled state of mind came from the fact that it was considered poor form for teachers to frequent the tenderloin district.

The Sex Element.

He says all his other troubles started from his being generally known as a moral degenerate, and, we must keep in mind, this means to him sexually impotent. The tip to make it hot for him was passed along from one official to another, in the United States government, in the Catholic church and in railroad circles, especially the Pennsylvania and Union Pacific. The patient considered the source of it all to be in the father of a school friend in an eastern city, to whom reference has already been made. This elderly gentleman whom we shall call Mr. X., was a director of a large railroad company. The opposition of Mr. X., the patient says, was incurred in this way. In June, 1905, he quit his position where he had worked six years. At this time the son, young Mr. X., a fraternity brother of the patient, was courting the sister of the patient's fiancee. At the same time another fraternity brother was courting the same sister. The patient, in conversation, both with his fiancee and with her sister, openly favored the other suitor to the disparagement and ultimate discomfiture of young Mr. X. Young Mr. X. has since married very happily, but his father, being vainglorious of his family prestige as well as of his personal prowess, could not forgive the patient his opposition to his son's ambition, and therefore was pursuing him relentlessly round the earth, by means of the powerful allies which his position in the business world gave him. The patient says, "For all these years Mr. X. has been on my trail. Everything which happens in this world which goes against me I lay to Mr. X. I can mention no overt act of his which would stand in court as evidence, but he [Mr. X.] knows it is true."

The situation in Manila became intolerable, and he left in December, 1907, for New Guinea. Sometimes he dwells upon the persecutions in the various forms above enumerated, all going back to Mr. X. accusing him (the patient) to the whole official world of being sexually impotent. At other times he says, as he did of his leaving the place he held for six years,

that he was thinking all the time of the girl, and could not get down to work. In any case note how the accusations all turn upon and against himself.

He had $2,000, and headed for New Guinea with the expectation of making an expedition into the interior and bringing out specimens which, when sold to American museums, would bring him many times what it had cost him to collect them. Upon arrival he found that an outfit would require more money than he possessed, leaving nothing for expenses. Together with this necessity for more money he had in hand the report of the Australian Royal Commission. This report had just appeared, and made the field appear most productive for a scientific expedition such as he proposed. It appeared to him the psychological moment to "strike," American museums for financing a collecting party. He therefore abandoned his plan for an immediate expedition and headed for New York. One evening, on the steamer from Australia to San Francisco, some one sang a song called "Life in the Philippines." The patient observes that he regarded it as "more than a coincidence that there were so many personal references" to him in the song. His name was not mentioned, but the references to his personal experiences in the "islands" could not be mistaken. So Mr. X. and his minions follow him back to America.

In New York as he was interviewing the director of a great museum for the purpose of financing his New Guinea expedition, it was made known to him that he would have to reckon with his own fraternity in a near-by city, before he could launch his expedition. In fact, they were then opposing it, so it seemed to him. And how did he get this information? As he talked to the director the latter "showed him his fraternity pin." This means the pin was accidentally exposed to the patient's view. Was this pin of the patient's fraternity? No, but that was a "sign of the opposition of my fraternity." At any rate, the scheme could not be launched. The failure was laid up to the general financial depression at that time, but he knew it was because of this opposition of his college fraternity. We see in all this the flimsy stuff of which delusions are made.

The patient found he had to go back to the Philippine islands "to fight the record he had left behind him" and "to vindicate himself" and "prove he was a man." Another time he put it, "I had to go back to fight the opposition and to prove myself that I was not a failure." He went back in May, 1908. He

encountered the same kind of opposition as met him the first time. In a letter to his sister, dated Sept. 4, 1908, from the road construction camp where he was then employed as time keeper, he says, "My two years' former horseplay seems to be recommencing, and the funniest part of my experience is that the perpetual trouble I seem unable to avoid comes from the hands of men whom I have every reason to believe think well of me."

From the same camp under date of Aug. 16, 1908, he wrote his brother, referring to his giving up the girl and cutting loose, in a way which showed he had no thoughts of making good again in that quarter. Then later in the same letter he declares he is still in love with her. He then refers to the opposition which developed to the first scientific job planned for him on his first visit to Manila. He says: —

I exhausted every effort to meet any objections I could imagine, and did my utmost to make good, when suddenly I became conscious that a rumor, to the effect that I was a moral degenerate, was current throughout the public of the city of Manila, and since, from hints, never from a straightforward statement, have I become convinced that, not only my family, but that more or less members of the public, wherever I have been, even to this very camp, have been aware of it. I cannot believe that there is any individual who bears a grudge toward me, and were it not for the self-evident facts, I could not believe any organization bore a grudge toward me, for I consider that I have acted toward both individual and organization more squarely than they have used me. In fact, I have thrown my case to them. I have told much of my most private affairs to them, and to-day I am completely at their mercy, with no possible way of rectifying what I consider the wrong they have done me. The more I consider it the more completely damned do I seem to be. Apparently my worst offence was that I was making good in a job, legally given me by proper authorities, and for this I find it to my interest to come back to the Philippine Islands and have it publicly known that I can cohabit with a woman, which I intend to do. But it does seem a pretty tough penalty on a fellow for trying to start a fishing school. But that will not remedy it. I will never marry without the girl knowing first my history, and I can see myself telling a girl this story. I am damned from a political position, even in a scientific institution, which I coveted, because my story is ever beneath to taunt me. I am damned from literature or any attempt to make my name prominent, because just so surely as my name appears my past will be raked up. You told me that this story was only known among men of little importance. I can tell you that the Archbishop of Manila, upon one occasion, told me that he doubted if General ——— would speak to me, and it is needless to say I have yet to give

him the opportunity to turn me down. Even in my retirement out here I dare not be as strong as I would like, for men don't take much stock in the side talk of a moral degenerate. It sounds too much like hypocrisy. And with all of this is the astonishing fact that personally I do not regard the worst that I have been guilty of is very much out of the way. There are parts of our daily toilet that it would make any one blush to have given to the public, and so it is with me. The notoriety has damned me about as effectually as the guilty conscience of a penitent murderer. I have been goaded and goaded myself into doing several things I would not have done, one of which was writing to E——'s (his former fiancee) sister, which was done more as a matter of showing there was no reason why I should not, and for which I have been bitterly sorry.

. . . . . .

I do not know what organization opposed me, and I do not care to know, nor do I wish to be a member of any Philippine branch of such, for although I am far from being a "little tin Jesus" I have got enough manliness in my degenerated body to prefer to lose my right hand than to take part as a fellow member in the tactics I have experienced on a sufficiently innocent man to rob such organizations of any claim of honorable manliness. I claim they have treated me with veiled, insinuating cowardice. Of course when I get hints sufficiently direct, it is my duty to protect my honor as best I can and as I wrote you previously it is my unavoidable duty to look up a certain individual in Manila. With certain unavoidable exceptions, such as this may prove to be, I have always forgiven individuals, recognizing them to be but tools of an organization or organizations. I hate to fight, but when I have to fight you can count on my trying to do my best.

I have overheard remarks — impersonal — that I could not answer, hinting that I have been given every opportunity to fight, — yet to fight the enemy entrenched upon their own ground, largely with ammunition furnished by them. I did not lose my mind as completely as it was reported.

This letter explains that I am damned, why I am damned, and why I can see nothing better than to die out here in the Philippines or New Guinea, or any other old place. No matter if my persecution continues, it is my duty to stay here for some time, although I realize that a recent hint that I am a white elephant is a true word said in jest. However, as an American citizen I have a right in these islands, and it is not my preference that I am here."

He signs himself to this, "The Black Sheep."

This letter gives the patient's point of view, at that time, August, 1908, in regard to his persecutions, and makes it clear that the same trouble has pursued him back to the islands. These persecutions led him to resign his post and go back to Manila.

RETREATS WITH GREATEST STORE OF SELF-RESPECT.

Under date of Oct. 6, 1908, he writes from Manila to his sister that he had given up what was in many respects a gilt-edged proposition, but "the truth of the matter is," he writes, "that I foresaw friction ahead, or thought that I did, and taking advantage of a moment when everything was rosy, discretion being the better part of valor, I resigned and arrived in Manila in time to take part in the welcome of the battleship fleet. The islands are in such a state of political potboil, or better, of intense political focus, that if you are not an active partisan in politics it seems to be taken for granted that you are a political spy or secret service agent. The realization of this has caused me to abandon hope of living out here in retirement, and with this exception I have now accomplished all that I can expect and all that I returned to do. To attempt any more to accept a political position or get into the competition of life out here would be to invite the return of trouble."

He then speaks of having been favorably received without making any effort himself to "cut ice." He therefore feels he has a "big reserve to the good," and "can withdraw from the Philippines with credit." "My life has been a struggle to gather some self-respect, and I have more of it now than ever I had before," he wrote in the same letter.

He writes his brother the same day: —

I cannot tell you what a relief this is to me. I no longer feel like shunning the company of any one, nor do I feel that a complimentary word or an appreciation of a respectable God-fearing wife or mother, whether of high or low station, is hypocritical sucking upon my part.

. . . . . .

Only to-day have I become entirely convinced in my own mind that things are as satisfactory as I can well expect, and with it comes the decision that now is the time to pull out.

. . . . . .

There is another point, — omitting the mysterious part which I do not understand, and am glad that I do not understand, — two facts are prominent before me, namely, that I owe some very great favors to the organizations of the Knights of Columbus and the Masons. Not being eligible in the former I can only apply for membership in the latter, which I shall do when I return to the east.

After returning to this country he decided to try theology, aiming to fit himself to be an "Episcopal priest." He began his

residence and study in July, 1909, and kept at it till the spring of 1910.

I was told in the Philippines that the methods employed against me had been ordered abandoned, and I do know that, had I commanded less influence, results would have been different. One of the first questions and most irritating asked me was to find out how much "pull" I had at Washington, and so my answer seemed unimportant. I caught it full blast, so that I feel I have been fighting a battle for the poor man. In fact, I am still fighting, for the opposition is unrelenting, but, whereas before it was a waste and beside the question, by my coming to [the theological school], I face it and it becomes a part of my training and my direct business to antagonize it. All straws point to this as my vocation. My almost "conversion" against my will. My attaining to years of discretion before my taking up the question. My varied experience in the *world*. The one avenue to right my reputation, — not with the world but with myself, — for irrespective of all slander I purpose ministering wherever I can do the most good, and that will not be in believing that so long as I do my duty the results — be they death, persecution or honor — are of God's choosing.

On Oct. 24, 1909, he wrote a long letter to his dearly beloved older brother whose wife is a Catholic. In this he intimates that this brother knows things about what the church wishes of him, which it would be better for both the church and the patient if he knew. He thought efforts were on foot to bring him into the church and to get him to marry the sister of this brother's wife. And still he wants to marry his former fiancee. So the dark influences keep battering him.

My position here [theological school] may easily be understood. It may be that God with his great wisdom has singled me out to accomplish something for him, and that I am here to gain a foundation for faith. At least I shall stay and give myself a thorough chance. I am very interested in the subjects, which looks encouraging.

As I get deeper into the game of life, losing trick after trick, I see its rules and methods ever more distinctly. I am playing bridge with the cards on the table, whilst my opponents hold theirs in their hands. My mistake was in attempting "bridge." "Cribbage" is more my style. However, it is at the "bridge" table that I am seated, and when my mother's photograph has followed my shoes to the "Hock Shop" then will I be wise in the ways of "bridge," — card-wise with no cards.

In another letter about this time he refers to his dread of Washington on account of politics, his failure at bucking the

great organizations, but with all this the reasonableness and harmlessness of his aspirations. He refers to the Philippines as a graveyard of reputations, and says "mine is there."

I am sorry that I am such a disappointment to all of my family, but my problems have been beyond my capacity. If the world would but become disgusted with me and let me alone I should be happy and, I hope, of some use to it.

On April 21, 1910, he writes his brother, after referring to the Catholic church and to his former fiancee,

I am very sorry this outside matter should estrange us, but I see that it is inevitable, and my flopping about, now on the Roman side and now against it, is exasperating to them and to me alike — looking like weakness, vacillation and cowardice even. I realize that I am plunging over a precipice principally for two reasons.

First, that I am completely in the hands of the Roman organization as far as my reputation goes, for they have been collecting evidence against me.

And second, that they would like to help me materially did I allow them to by becoming one of them.

It has been insinuated to me that this course will mean suicide. My reply is that the sooner I am dead the better for both of us, and I am quite willing to trust God's judgment as between us.

I have suffered some awfully mean tricks, and I have had some ex-extremely generous possibilities offered to me by the Roman Catholics — which have pained me, for if they would only — or you would have only talked plainly and frankly I could have explained myself — but you too, it seems, must speak diplomatically.

The Masons have also played equally if not meaner tricks upon me, but afterward and ever since they have been most generous.

I must join some organization as soon as possible, for I cannot fight all hell by myself indefinitely.

The above is in the exact order and form as written. He then tells the brother he must choose the Masons, despite his duty to his brother, and despite the fact he is at the "Roman Catholics' mercy," for he yet had another brother and a sister, and the Bishop, and furthermore the Masons have helped him with his fiancee.

He secured an eminently satisfactory position as assistant to a superintendent of a museum of natural history — work to his taste and a chance to work quietly.

He writes his sister about his rooms, June 29 (1910), that they: —

give me the feeling that I am not being spied upon, although this may prove elusive. If my enemies are merciless I shall probably break down mentally, but if I am to be unmolested, as it looks at present, I think that at last, here I can gather my feet under me. I am not normal mentally, I am brain tired, and feel that whatever I seriously attempt will be destroyed; also if I think seriously I become either despondent or exasperated, so I have to live and think shallowly.

He seems to have an intimation that it is to an insane asylum that his enemies are steering him.

July 16 (1910?) he decides again to be single, and notifies his former fiancee, and writes his sister of his discouragement, and ends with this: "But why aren't the wilds of New Guinea the simplest, sanest and easiest way out of it? I think so. I long for them."

Early in 1912 he was made superintendent of a small hospital where a friend was medical officer. He had exhibited some suspicious behavior and had to leave his apartments near the museum. He wished to leave the city. In this hospital position, he had a violent quarrel with a surgeon, and left his post after five months' tenure. He then went to the old family home in Massachusetts, and lived alone there for one year before entering the hospital, whither he felt he had been drifting for some time.

The family and friends of the patient had certainly spared no means, financial or social, in their endeavor to help this man find himself socially. The wreck of personality must be attributed to inherent defects. By inheritance he had an incapacity to find himself socially.

On admission to the hospital he insisted his former fiancee (whom he really knew was happily married) was to be his wife. He counted her in on all his schemes for an expedition to New Guinea. This expedition seemed to be the first thing for which he was living. He drew up in writing an elaborate plan for such an expedition.

When he received a letter some months previously from his former fiancee, in which she told him of the accomplishment of her marriage, he sent this letter to his elder brother, and wrote him: —

The enclosed letter speaks for itself; you have cut me deeper than anything else could have done. I shall say no more out of regard for your feeling, although you have never regarded mine. For God's sake do not answer this or write to me again, as I credit you with only the best of motives.

He evidently took the marriage as part of the Romanist plot in which this dearly beloved brother was involved, and later he refused to accept the alleged facts. He persistently addressed the lady as "Miss," and by her maiden name.

As samples of the alarming literature he was composing in the summer of 1913 the following are submitted: —

June 28, 1913, Wednesday Letter — War is Hell and I propose to make it so. Please see that Mr. X. gets this ultimatum. Either you open negotiations with me before Monday next or I shall proceed with the first step in my self-vindication; and the ethics of the beginning of my feud with X.

I have undergone the trials of Job to avoid this. I have received precedence at his hands that allow me to run riot mercilessly over men and women, friends and foes.

Unquestionably my language is offensive. For eight years I have endeavored to act as though I were dealing with a gentleman. I shall see now whether the damn fool can understand plain English. I said that I would use a bitterness that cannot be healed. My view of the truth is sufficient to bear me out in this remark.

If he will put himself in my position he would see that I must do as I say. To stand myself and my most intimate friends in the lime light will be exceedingly disagreeable to all of us, and entirely unnecessarily cruel. However, if you will follow out in your mind any campaign that I can follow, they all lead inevitably to this climax, and I propose to force things just as hard as I can. You often can best fight fire with fire. I have exhausted ———'s [his own name] tactics, and now I am fighting X. with X's tactics.

Perhaps he will understand them better. Until Monday I shall continue a running fire just to prove that my ammunition is in good shape.

Devotedly,

BILL THE PIRATE.

This postcard to his former fiancee exhibits the virulence of his paranoia, and reveals again the sex basis of the same.

JULY 10, 1913.

DEAR LITTLE E. — I shall not leave the bay without you. To-morrow X. and the basket of eggs followed by the concentrate of hell. In all the

fight so far I think I have not even had a vulgar thought except one: — The proper way to capture X. is to put salt on his tail, for which I apologize and will promise not to repeat. Things are not moving to my liking now — But really imagine Napoleon fleeing down Chestnut St. [fashionable shopping street] panama in hand, coat tail flopping, with your own dear Bill the pirate in pursuit endeavoring to get the neck of a salt bag within the band of his ample breeches. For a pirate what a stern chase.

Put your toothbrush and your vanity case in the trunk.

Devotedly,

BILL THE PIRATE.

These threatening missives to and about the elderly father of his college friend produced an increasing anxiety in the minds of the friends of the old gentleman. All were aware of the delusional character of his apparent beliefs. It seemed that the conviction that Mr. X. was the cause of all his unhappiness was strengthening in his mind, and that no certainty existed that he would not suddenly take measures to do violence to this person. For the safety of Mr. X. the patient's brother and sister placed him in the hospital.

MENTAL TRAITS OF THE PATIENT.

From the reported interviews with the patient and his brothers, and from the letters of the patient, it is possible to draw up a pretty clear outline of his character and of its development. The development of his paranoid state, studied in detail, shows that his *delusions* of persecution grow directly out of his *feelings of inadequacy*. And these feelings of inadequacy are the quite well-warranted reflections of a general anomaly of his character. In this anomaly of his character is involved his sex instinct. In fact, in early manhood this becomes focal at times. Such an example is the stated purpose of his second trip to the Philippines when he was twenty-nine years of age.

1. Turning to the mental traits as we find them portrayed in his history we find a *lack of persistence*, written in large characters, all over his career, from early childhood. His *will* was *capricious*. In the nursery and the school he never took a willing part in games. He was not skilful, and got no pleasure out of contests. He was always a collector, but his collections, like everything else which interested him, stopped at early stages. Likewise his studies were pursued spasmodically and erratically. His failure as a medical student was due to the same caprice. There is no question of lack of intelligence. He could have car-

ried off honors in such work if he had persistently wanted to do so. He held to a clerkship for six years. But this is no evidence of persistence. His main interests during that time were social, and he became engaged during the fourth year of his service. His telegram for $500 for a horse, probably contemplated going into his small patrimony, and was not a request for the money as a gift. Even with this interpretation it is a rather capricious procedure, and indicates lack of careful planning of his career.

Leaving his place with no prospect, his useless invention, and the plan to set up as printer without money or training, are further evidences of the planlessness of his life. The further failure to make good in another business in which his friends gave him a chance evidences a state of mind quite unable to work as a unit in organized society. These things alone might constitute an adolescent upset produced by the misfortune of forming an alliance which his achievements did not warrant. But they fit in so neatly with his childhood and his later adult career that they must be considered results and manifestations of the same incapacity to plan his career. The alliance was altogether in line with the family traditions, and would undoubtedly have proved satisfactory to all if the patient had been as good in mind and character as were his brothers and sister. Breaking the engagement was logical for him, but it is further evidence of the illogicalness of his character. He was really not able to work or to marry. His disability lay in the poor structure of his will.

He set out for the Far East on a sailing vessel. The teaching position in which he found himself was not to his liking. This alone spelled failure. But he wanted to do something for which no provision had been made, and he was not able to provide the opportunity. He wanted to teach fishing in a school of fishing. His collecting expedition failed at New Guinea and in New York City. It would have failed had it been financed. He failed in theology. He failed in his quiet museum position, which seemed carefully adapted to his peculiar needs. He failed in his management of the little hospital by quarreling with the man who befriended him.

This lack of persistence in his character is a pathologic defect in the organization of his volitional equipment. He lacks patience and power of appreciation. Ideas have to be novel and large in order to hold his attention. He is not abnormally distractible, and his powers of inhibition are good. His *defect* is in the *grain or texture of the fabric we call character*, by which one

sticks by something till he achieves some individuality thereby. This man, neither as child nor man, learned the supreme joy of successful creative effort. He never acquired habits of industry or genuine love of work. In the habits of his life this fundamental defect in organization stands out. The logic of the plan by which he was made left him thus incomplete in his character, and consequently in his social relationships. This incompleteness he had the sensitiveness to register. He felt it, and was unhappy on account of it. But he was impotent to correct it. He knew instinctively that he was a lame duck and a floater, but *he had not the instinctive equipment to integrate his own will and make of himself a man.* Objectification of this — the seeming causes of this lack of integration of will — constitutes his paranoic state of mind. His delusions are logical when viewed from within. His persecutions are the objective causes of his unhappiness. The real causes of this unhappiness are subjective. He is defective in his capacity for social integration. To acknowledge this would contribute further to his unhappiness. Hence the persecutions are raised as a defence for his own defect.

2. Emotionally he shows an *inconstancy* and *inconsistency*, which amounts to the cyclothymic constitution which is supposed to underlie the manic-depressive form of psychosis. The whole world is alternately rosy or dark, as he is riding upon the crest of a wave of achievement or is realizing his inadequacy. The emotional rhythm in his case may be understood when it is viewed as the normal emotional reflection of the alternations of his own self-illusionment as to success and his realization of his failures. Riding upon the crest of a wave of enthusiasm over his engagement, he resigns his position, without business prospects. The depths to which he plunges lead him to break his engagement and seek peace and a new start in a long sea voyage and in the Philippines.

In the same letter he says he has given up the girl once and for all, and he also is deeply in love with her, and seems to purpose to marry her. In the height of his persecutions he does not want to join forces with any organization which has persecuted him, and then writes his brother he owes much to the Knights of Columbus and to the Masons, and must join the only one of these to which he is eligible. Both these organizations had persecuted him. The force of his persecutions broke in 1908, and he felt he retreated from the Philippines at a very auspicious time. He came out with his reputation at a high flood, for him,

but he saw trouble ahead if he stayed. He says he did not then feel like shunning the presence of any one.

Again, he himself speaks of flopping about, now on the Roman side, and now against it. This is fundamentally fluctuation of belief. But this is probably correlated with change of mood.

3. With this cyclothymia there are evidences of marked *irritability* at times, and also times of extreme *depression*. Such episodes as stealthily striking his brother on the head with a coal shovel, his fist fight with the captain of the sailing vessel, and his quarrel with his medical friend in the hospital, show his spasmodic irritability and quarrelsomeness.

Of his depression he says in 1905, when he could not make good in a position his friends got for him, that he "was more than blue, — was almost distracted." He writes from the Philippines and from the school of theology that he wishes he were dead. He evidently had vague hopes the Philippines would offer a way out, and that was his real thought in regard to New Guinea. But his despondency never took any effective turn in the direction of suicide. His own stated reasons for depression are that he seems to be bucking hopeless odds, — to be fighting all hell alone. He says if he thinks seriously he becomes either "despondent or exasperated" (depression or irritability when he really confronts life). On this account he "must live and think shallowly." This means he must keep away from life, of which he is no real part. He is like a bird flying against the glass. He cannot understand what he is flying against. He knows this and therefore seeks New Guinea, but while in the situation he is either flying against it, exasperated and irritated, or lying helpless in the cage, dulled and depressed. He says of himself that he will break down mentally if his enemies are merciless; that he is brain tired, and is not normal mentally.

4. This patient is *mentally awkward*. Hs is afflicted with a *morbid introspection*, inquiring into motives in others and the reasons for his own feelings. This was shown while he was yet a child. On the mental side this is comparable with the awkwardness of the rapidly growing early adolescent. Both have acquired powers of the uses of which they are ignorant. His father found him awkward mentally and not subject to disciplinary measures availing with his other children. He soon gave him up as hopeless, considering that nothing he could do would alter the conduct of the boy. The same awkwardness and ill-adjustment are exhibited in his writing to the sister of his fiancee "to show

there was no reason why I should not," and then being bitterly sorry for it. This is not unusual in the storm-and-stress period for youths of mystical temperament. But in any case it is *mental* awkwardness.

5. The patient *realizes* his *mental awkwardness* and is conscious that he fails to measure up to standard. He says in 1908, "My life is a struggle to gather some self-respect." This was the real reason for his giving up his place, for breaking his engagement, and for his going to the East. The theological course appealed to him as a means of righting his reputation not with the world, but with himself. He knew and wrote that he was playing a game where his opponents all knew his whole game before he made a move, but he was absolutely ignorant of their cards, of what moves they would make, and in fact of the rules of the game. He saw his predicament as playing a game which he did not know. From this source, by the logic of his under-consciousness, he raised up the organizations and a person typifying great power as the embodiments of the cause of his internal disquietude.

6. Intimately woven into the texture of his delusional life we find certain *sex elements*. This reaches its climax apparently in his second visit to the Philippines, when he writes his brother that he had to come back to the Philippines (1908) in order to have it publicly known that he could cohabit with a woman. The beginnings of his persecutions in the Philippines (1908) involved his being taunted with sexual impotence. No one told him he was impotent, but he felt that everybody thought so. This is the method by which he objectifies his own beliefs and fears for himself. He had either proved himself impotent or had psychasthenic fears of the same. From his account of repeated failures to complete the sexual act in Manila, it is evident he had such an interfering mental factor. His fear that he could not complete the act objectified itself in the noises made by imaginary persons spying upon him for the purpose of seeing for themselves what he could do. And these hallucinations were so real that he threatened with a razor some persons whom he found nearby.

With this evidence of anomaly in the organization of the sex instinct it is entirely within reason to lay upon this ground his act in breaking off his engagement. His proved industrial incompetence seems equally substantial ground, however, upon which to base this action. Probably they are closely interrelated

and are jointly responsible for the act. That there is a deep-lying sex anomaly running its warp through the fabric of his paranoia is further indicated by the indecent post card written to his fiancee five days before coming to the hospital. The reference seems to indicate a plan to put a quietus upon the virility, — immediate sex activity, — of the old gentleman who has come to typify all the shortcomings of his own (the patient's) character. As he, the patient, prepares to sail away with his bride to a world where all will be new and therefore without opposition and enemies, this old man, typifying all his persecutors, is to be salted down. And the sex activity seems to typify in this particular person all of that person's opposition. By a double vicariousness this man's sex activity comes to stand for all the patient's persecutions. It stands for the person himself, and he stands for all the oppositions and persecutions. It will be recalled in this connection that his own explanation of the enmity of this man for him was that he, the patient, wounded his pride and hurt his prestige by successfully talking against this man's son as suitor for the affections of the sister of his own fiancee. By thwarting this turn of the mating instinct of the son he thinks he aroused the deathless persecution of the father. In this latest reference to the father his sex activity seems to stand for the whole personality.

7. The patient says that his *persecution* began in May, 1906, soon after his first arrival at Manila. He was twenty-seven at the time. This was very likely the first explicit paranoic manifestation. He was thwarted in not getting the job he wanted, by the petty jealousies in the teaching staff, and by having the natives alienated from him. Very soon the word passed around that he was a moral degenerate, — sexually impotent. To disprove this he went to the brothels, and was interfered with and spied upon. Also his conscience troubled him because he knew a teacher should not frequent such places. The word was passed through church, government and railroad circles, and it was all set going by Mr. X. in Philadelphia.

The steamer song referring so specifically to him, and the meaning of the fraternity pin on the museum director in New York, show of what flimsy stuff his delusions are made; what chance occurrences may provide material for beliefs; how he *violates reality to substantiate what he wants to believe.*

The same persecutions followed him on his second trip to the Philippines. His older brother was later in a plot with the church

to get his fiancee married to another man, and thus get him to marry this brother's wife's sister, a Catholic, and so get him into the church.

He was very leery of political organizations. When locating in Washington he was very careful to select quarters where he would not be spied upon, and wrote of his feeling of security there. But this wore out in eighteen months. His next asylum held him only five months. Then the year alone in the old home. This was peaceful at first, but he soon wrote that things were not going to suit him, and he became more violent in his denunciation of his arch persecutor.

The Origin of the Paranoic State.

It seems reasonably certain that his own fear that he was not normal sexually was mixed up with the origin of this man's delusions of persecution. That this was a fear rather than a fact he himself asserts. But the fear (mental state) also prevented the completion of the act on some occasions. That such a sex fear should grow out of a situation wherein, on account of his own economic unfitness, he had set the object of his affections free to marry another, and had gone off into a new world to begin again, is perfectly intelligible, even though his sex instinct and his sex life had been perfectly normal up to the time of breaking his engagement. We have no information leading us to suppose any more fundamental sex anomaly underlying this paranoid state.

The *sex fears*, and the suspicions attending them and assigned as causes of the realization of the fears, are *typical of his whole life*. From his childhood he has realized continually that he could not accomplish things as other persons, and he has been forced to find reasons for his failures. He was hypersensitive, and began as a young child looking for ulterior motives in others, and was morbidly precocious in introspecting his own mind. The peculiar and unnatural social relations in which he found himself worked upon his sensitive nature the alternations of despondency and exasperation, these cyclothymic changes depending in part upon the physiologic conditions of metabolism.

The human mind demands intelligibility in its world. Such a misfit mind as that of this patient is no exception to this rule. He has good mental ability. His capacities to learn and to fit ideas together in logical sequence are excellent. The fundamental defect in his mental make-up, we have seen, is in the

realm of the will. He has not ordinary capacity to stick to and achieve. He fails therefore to make good as an integral unit in society. His *character*, therefore, remains *infantile*, and yet he had the sensitiveness to realize this difference between himself and other men.

His persecutions are, for him, the logical explanation of the results of his unfitness for social living, or of the defects in his own character. In this case delusions constitute a natural supplementing or completing of the world, or his experiences of it, for one who is socially incompetent. He has a character defect, and his *delusions* are the *objectification of his explanations of these defects*. Through his history we find this parallelism, — the worse his disappointment with himself the more elaborate the machinery used by his enemies, and the more powerful these same enemies. His *foes* as we see them are of his own household, *within his own mind*. His second defect shows up in his inability to see his own enmity to himself. His abnormal incapacity for achievement is blamed upon others. He runs to cover, in a voyage at sea, in the Philippines, in New Guinea, in a theological seminary, in a quiet museum position, and in the solitary life of an old home in a small New England town. All the time he is really running from his own incapacity to be a man among men, recognize his limitations, and keep up his courage and work away to make more of a man of himself.

The combination of his *inherent incapacity* to fit in with men, and make himself a social unit through achievement, and his extreme *realization of the unhappiness resulting from this incapacity*, lead with the inexorable logic of events to *delusions of persecution*. Blaming others with his unhappiness is the only way to inner harmony for him. This is his defence reaction. Being the possessor of a disjointed subjective world, which cannot be organized because of his defective capacity to work consistently for worthy ideals, he finds the reason for his abortive undertakings in the fiendish plan of other persons and organizations, devised for the purpose of his undoing. Given this inadequacy for social living and the realization that life is too much for him, one of his temperament must hold to delusional beliefs in persecutions. This is the only way for him to preserve any integrity of personality and self-respect. For another temperament, with a different balance between self-esteem and self-abasement, it would bring profound discouragement and attempts

at self-destruction. In such the primary defect would be in the affects.

In this paranoic personality the primary defect is in volition and capacity for organizing his personality. His powers for receiving and elaborating ideas being excellent, and he, therefore, being received and dealt with as an equal by well-endowed and successful men, he is a great disappointment to himself when he fails. His self-esteem, wounded by his own failure to develop a character which can locate on a piece of work, and work persistently at the same, does not allow of the relatively delusionless depreciation of self which is found in the depressions of manic-depressive psychoses. The logic of events drives this patient in the direction of a *reasonable explanation of his own defective conative capacity*. His failures, therefore, are attributed to opposition and accusations of enemies who thwart his purposes. By these allopsychic delusions he preserves the integrity of his inner worlds.

He seemingly fears great organizations. The greatness is really the greatness of his disappointment with himself. This fear drives him to the Philippines, to New Guinea, to the relative solitudes of the museum, the theological school, and the large grounds of an old home. But these persecutions are the figments of his own mind, raised up to hide the *disagreeable, ugly fact of incompetence in himself*. This is what he really says it is, in a darkly veiled manner, when he writes he must *live and think shallowly*, that whatever he seriously attempts will be destroyed. He realizes that if he ever gets to living a normal life it will be in a much smaller way than that his ambition pictured for him. He sees that a quiet little career in a museum is the place where he ought to gather his feet under himself. At the same time he really knows that his ambition will not let him be content with such an achievement (gathering his feet under him in such a small career), and he sees that he is going to break down mentally, — sees himself drifting to an asylum for the insane. He allows us to see, at times, that he really knows this drift is caused by his own *conative incapacity* to realize his dreams. He dreams of enemies and persecutions which thwart his inadequate purposes. And these imagined explanatory causes gradually organize in his mind as a substantial part of his experience. This false world comes in response to a deep personal need. He must believe in these thwartings in order to preserve his *own self-respect*.

In connection with such an attempt as we have here made to bring out the mechanism of the genesis and organization of delusions of persecution, the question occurs as to whether or not this is a defence-psychosis. That the fabrication of the beliefs in these persecutions and persecutors has found its inception and maturing force in a *defence* of the personality we have no doubt. The alternatives, in case of such an inherent defect of will, — such an incapacity to develop character through social relations, — are: (1) to recognize the defect and blame one's self, and (2) to remain blind to the defect and blame society. The persecutory paranoic development is this blaming of society for the flaws of one's own inner constitution. This is a species of loyalty. It is a *defence at all hazards*.

This defence proceeds from instinctive and affective character-elements. It is not a conscious elaboration. The logic used is not of the syllogistic sort. We do not wish to degrade the terms *reasoning* and *logic*, or to supply any new or wider connotation for them. We find no better way, however, to express this *defence of the personality* adopted by a paranoic personality than to say that the logic of events compels the belief in persecutions which themselves cause the person to fall short in accomplishment all along the road in his character development. These false beliefs are the necessary explanations for the state of affairs within the household. The paranoid mind believes in its delusions by the same token that makes the Kantian believe in God, freedom and immortality. For each these are the necessary foundations of the inner life as it is. The inner life is the reality, and these ideas have a borrowed, but no less vivid, reality because the most immediately real depends upon them for its being.

This *defence* of the self in this case does not require any occult or elaborate means for its revealing. The patient's own words, in his conversations and letters, reveal his instinctive defence against his unhappy realization of his own defects, in the form of a world-wide clique of persecutors. The defence is an objective justification.

It may be there could be found in this life a *break or a tear*, in the sense of Bleuler.[1] Perhaps his breaking off with his fiancee and his failure to work his way in the world constituted such a break, and thus provided the place, in the time stream, for the emergence of his delusions of persecution. But if this is the moment of emergence of the paranoic state, the natural history of the character, preceding this moment, must be reckoned more

significant for the understanding of the paranoic state, for it is fundamental and essential to an understanding of how the subtle suggestion of persecution gets hold of the mind. His life is a development of an unwelcome and unacknowledged realization that he is a misfit, — that he cannot do things as other men do. There develops thus the complement demanded by his pride in himself, — the "fundamental tendency to twist a wide range of experience in keeping with a bias or reactive tendency" which Adolf Meyer refers to as the chief focus of psychopathological inquiry in paranoics.[2]

The same lack of volutional capacity, shown in the special defect of this character, is again emphasized by his resort to delusional beliefs to explain himself to himself. The same boy who is always starting things and can "never bear to finish anything" has such an inability to entertain reasonable doubts that he is compelled to finish his world right off. The false beliefs are seized as a means of completing and rounding out the world. In this he is a severe dogmatist, as Adolf Meyer insists are all paranoics. He has no tolerance for his own slow and imperfect development. In fact, the scheme of working out a career for himself has no abiding place in his mind. He dogmatically assumes that others are to be blamed for his unhappiness.

In reference of the case to Southard's categories,[3] it seems to afford a good example of "precipitated subjunctive." This type of mind cannot hold these subjunctives in a state of solution. It cannot wait for the cumulative evidence of events. Events which have already occurred compel the degradation of subjunctives as indicatives. The hypothesis which would make clear the inner unrest is regarded as accomplished fact, and so a seemingly factual ground is afforded for the subjective instability. Thus arises the *pragmatic paranoia* which boldly threatens the personal safety of the arch persecutor.

Pursuing Southard's grammatical characterizations, we find in this case all three of the voices, but the dominant one is the passive. The outside world is persecuting the patient. With this dominant note of passivity there often emerges a streak of reflexive action, as when he refers to himself as a white elephant upon the hands of his family, and at another as being compelled to think shallowly because otherwise he becomes exasperated or despondent. At the time of his confinement he was exhibiting more of the active voice attitude (grandeur) than at any previous point in his career. This transition from passive to active (per-

secution to grandeur) has long been familiar in paranoics. The delusions which have long been ego-centripetal are now on the point of becoming ego-centrifugal.

In the Kraepelinian classification this case is probably one of the paranoid group of dementia præcox. In the time of our knowledge of the case there has been a decided narrowing of interests and increasing contentment with constricting spheres of activity. This is distantly related to the affect disturbances of hebephrenia. The involvement of the sex life would unquestionably place the case in the Schizophrenic group for Bleuler. The prognosis must, therefore, be a slow course of deterioration. The personality will become more and more split apart from the social life of which it is a part, and therefore a more and more shrivelled entity.

This prognosis contemplates the high probability of a frontal lobe pathology. The only therapeutics any one can contemplate in such a situation is mental, and we must frankly recognize the expected efficacy of such will be inversely proportional to the hold which any pathological process has upon the brain.

The neuromental mechanism of this person had a *congenital twist*. The time for most hopeful application of psychotherapy had long passed when he came first to a hospital at thirty-four years of age. It is evident, if our analysis is correct, that his delusions and whole pragmatic paranoia can be abolished only by abolishing the subjective need for these false beliefs. These delusions have arisen to provide "harmony at least in the personality." They are an excessive and poorly adapted morbid work of adjustment (Adolf Meyer). To remove them it would be necessary to remove or obliterate the conditions to which they provide correction. To this extent the self and its world must be reconstituted.

The condition underlying his delusions we have seen is primarily lack of persistence in pursuit of any aim. In how far this could have been corrected by *mental orthopedics* in childhood it would be impossible to indicate from our knowledge of his life and present condition. It is to be supposed, however, that his native twist was allowed to have free course by teachers, as well as by the father, who early decided it was useless to attempt discipline of the boy. Such neglect was most pernicious. In the formative period some means should have been found of securing persistency of interest in some attainment. Such would have been the making of this character. In the absence of such

cultural countertwist the working out of his paranoic state from the native bias of his mental make-up was inevitable. Education, in the sense of control of character-formation, should have saved him from these enemies of his own household. Since it did not, the work is many times more difficult; it is impossible, if perchance the habits or sets of frontal lobe elements have reached a pernicious or pathological definiteness.

REFERENCES.

1. E. Bleuler: "Affectivity, Suggestibility and Paranoic." New York State Hospital's Bulletin, February, 1912.
2. Modern Treatment of Nervous and Mental Disease. White & Jelliffe. Vol. I, Chap. XIV. "The Treatment of Paranoic and Paranoid States," p. 616.
3. E. E. Southard: "On the Application of Grammatical Categories to the Analysis of Delusions." Philosophical Review, May, 1916.

FATTY DEGENERATIVE CHANGES IN THE PURKINJE CELL BELT OF THE CEREBELLUM IN EXHAUSTIVE INFECTIVE PSYCHOSES.*

By Egbert W. Fell, M.D.,

ASSISTANT PHYSICIAN AND PATHOLOGIST, ELGIN STATE HOSPITAL, ILLINOIS.

Abstract.

I. Purpose of study: To determine (1) frequency of fatty change in the cerebellum in toxic condition; (2) element most affected; (3) extent of fatty change; (4) relation to glia cell increase.
II. Material used included various toxic and exhaustive, or infectious, conditions, controlled by arteriosclerotic and dementia præcox material.
III. Staining methods — Scharlach R. in frozen sections. Cresyl violet in frozen sections.
IV. Recital of cases: (1) clinical features; (2) more important post-mortem features; (3) cellular changes in cerebellum.
V. Summary of cerebellar cellular changes.
VI. Discussion of changes: (1) relation to duration of toxemia; (2) relation of fatty to glia change; (3) occurrence in other psychoses.
VII. Conclusions.

Recent advances in the physiology of the cerebellum, as reviewed, for example, by Mills and Weisenburg (Jour. Amer. Med. Assn., Nov. 21, 1914), show that the function of this organ (probably represented by the Purkinje cells) is to maintain synergic control of movements. While certain portions seem more concerned with certain complex acts, localization is not sharply defined. The organ probably acts more as a unit than does the cerebrum. Exhaustive infective psychoses, presenting, as they do, asynergic symptoms, as tremors, asthenia, atonia, ataxia, seemed to offer a good field for the study of cerebellar changes, and it was suggested that such a study in toxic states of various sorts would be of value in determining: (1) what element of the cerebellum was most affected; (2) the frequency of fatty change; (3) the extent of that change; and (4) its relation to glia cell increase.

The material at hand consisted of six cases autopsied at the Boston State Hospital by Dr. M. M. Canavan, and includes various toxic and exhaustive conditions.

* Read in abstract and demonstrated at the Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being M. C. M. D. Contribution No. 1916.17 (whole number 159). The previous contribution was by Thomas H. Haines (1916.16,158), entitled "The Genesis of a Paranoic State," submitted to Journal of Abnormal Psychology. Reprinted from the Boston Medical and Surgical Journal, Vol. CLXXV, No. 23, pp. 819–822, Dec. 7, 1916.

The Technical Method. — Frozen sections, made from formalin-fixed pieces of cerebellum, were stained with Scharlach R. and counterstained with hematoxylin, giving an intense salmon-red stain to the fat against a blue background. Continuous sections were stained with cresyl violet (Nissl's original stain did not give equally good results with the frozen sections).

Case 1. — Female, single, 66, was admitted Dec. 31, 1910, without a history. She was exhausted and jaundiced. There was a slight fulness over the left thorax. The radial pulse could not be felt. There was marked clouding of consciousness. On attempting to reply to questions her words could not be well made out. She appeared disoriented. She was restless; threw herself about in bed and attempted to get out. She may well have had hallucinations, and screamed at times without apparent cause.

She died Jan. 1, 1911, within a few hours after her admission, and autopsy was performed two hours later. The more important findings were: chronic fibrinous pleuritis, both sides; left hydrothorax with congestion of the left lung; chronic interstitial nephritis; bile capillaries distended, but the duct was patent; a small area of chronic external pachymeningitis over the inferior portion of the left ascending frontal convolution; pia uniformly thickened.

Microscopic examination of the cerebellum showed red staining of many of the small cells in the granule layer and of a large proportion of the small cells in the ganglionic area. Of the ganglion cells, about one-half were markedly affected, nearly all to some extent. The nucleus of many of the ganglion cells was distorted and dislocated, and with the cresyl violet stain tigroid bodies were found to be absent from a larger or smaller portion of the cell. There was little, if any, increase in glia cells.

Case 2. — Male, 39, single, was admitted Feb. 7, 1911, and died within twelve hours. Aside from his having been markedly alcoholic, nothing was ascertained as to his past. Respiration was difficult, and there was evidence of consolidation of the right lower lobe. His pupils were equally dilated, but the neurological examination, as far as it could be made, was otherwise negative.

He was disoriented and so confused as to be unable to give information. He was apprehensive, evidently as a result of hallucinations, and he spoke at one time of seeing rats.

Autopsy was performed thirty-four hours post mortem. There was found a right lower lobe pneumonia with an accompanying pleuritis. There was some sclerosis of the aorta and of the coronaries; the heart was large,

weighing 535 grams. The liver was large and fatty; kidneys showed a chronic interstitial nephritis with an acute degeneration. There was considerable subpial edema.

Microscopic examination showed a few red-stained small cells in the white matter of the cerebellum. Only an occasional cell in the granule layer was affected, but many of the small cells in the ganglionic zone. Of the Purkinje cells, about two-thirds were markedly involved. In many nearly the whole cell was filled with granules, the nucleus being to one side, the cell misshapen, and with the cell stain, showed marked lack of tigroid bodies and the nucleus often staining quite indistinctly. There appeared to be little neuroglia increase.

Case 3. — A female, 53, married, was admitted May 9, 1911, with a history of having used alcohol moderately. Two weeks before admission, while getting dinner, she sat down, and it was noticed that she could not articulate well. The right side of her face was said to have been drawn down. She complained of a slight headache. When examined, her pupils were irregular, but reacted. There was only slight motion in the right side of the face, the upper part being involved as well as the lower, and the tongue deviated to the right on protusion. The heart was enlarged to the left. There was no paresis of the extremities and the reflexes were normal. Urine sp. gr., 1035, and contained sugar. She appeared to be disoriented, but to what extent could not be well made out on account of her difficulty in articulating.

During her stay she had convulsive attacks, not accompanied by loss of consciousness, which involved only the right side of the face, the tongue and neck muscles. These clonic spasms lasted from ten to twenty seconds, and at times occurred as frequently as every one-half to two minutes. She developed a left broncho-pneumonia with slight temperature, and died May 11, two days after admission.

Autopsy a few hours post mortem. More important findings: Hypertrophy of heart with fatty degeneration; fatty degeneration of kidneys; subpial edema with atrophy of the convolutions in the frontal, pre-central and post-central regions; irregular sclerosis of the basal vessels.

In the cerebellum the endothelial cells of the capillaries were more markedly involved than in the preceding cases, the red granules being larger. Two-thirds of the Purkinje cells had marked deposits of granules, and very few were not involved to some extent. In this zone the affected small cells formed an almost uninterrupted layer. With the cellular stain, disintegration of the tigroid bodies appeared quite marked. There was some increase in neuroglia cells in the Purkinje layer.

Case 4. — Female, single, 60 years of age. She had always been peculiar and irritable, was inferior mentally and had had a number of illegitimate children. In 1911, one year before admission, she began to fail physically, and examination by a physician showed that she had well-advanced pulmonary tuberculosis. At about the same time she developed ideas of hypnotism and of influence.

On admission, Feb. 9, 1912, she was in a much weakened condition, and examination showed a marked involvement of both upper lobes. She was irritable and fault-finding, thought every one was against her, that she was being hypnotized and influenced. Her ideas do not appear to have been at all well worked out. She was oriented and memory seemed good.

She had a temperature from the time of her admission, often going to 102 or 103 in the evening.

She had attacks of diarrhœa. Two days before her death, on Oct. 6, 1912, she developed a left femoral thrombo-phlebitis. She became dyspneic and moist râles were heard throughout the lungs.

Autopsy three hours post mortem disclosed advanced pulmonary tuberculosis; tubercles in the liver and spleen; tubercular ulcers in the ileum and colon; thrombosis of left iliac vein. Pia only slightly thickened; nothing else of note in the brain.

Microscopic examination: The cerebellum showed a moderate degree of change, confined mostly to near the ganglionic zone. About one-third of the Purkinje cells showed fat, but the deposit was nowhere very marked. Not many of the cells had nuclei dislocated, and with cresyl violet few showed internal disarrangement. There was some increase in glia in the ganglionic area.

Case 5. — A female, 42, divorced. Her father and mother were both alcoholic. In 1911, two years before admission, she had an operation for carcinoma of the uterus, and a year later began suffering from symptoms of an extension of the growth, pain, incontinence of urine, etc. About this time she began to hear voices, thought people were watching her, and that her food was poisoned. She reacted to these ideas.

When admitted, July 1, 1913, she was poorly nourished, but aside from evidence of extension of the carcinoma to the vesico-vaginal septum, there was nothing of importance found physically. She heard people outside cursing and saying that she was immoral. They were digging her grave. She was apprehensive and yelled out of the window at her tormentors. A little later the nurses seemed to talk among themselves about her and do other things to annoy her. She was oriented. She grew weaker, had vaginal hemorrhages, and died July 27, 1913.

Autopsy performed three hours post mortem showed a hydronephrosis from obstruction of the vesical orifice of the ureter by the carcinomatous

growth. The pia was not thickened, and there was no sclerosis of the cerebral vessels. The brain substance was of a decreased consistency in both parietal regions.

The cerebellum showed considerable change in the capillaries, the red granules often being large. There was a fairly marked involvement in the granule layer and of the small and ganglionic cells in the Purkinje layer, about one-half of the latter being markedly affected. Considerable derangement of the internal structure of the ganglion cells and an increase in glia cells in this region was noted.

Case 6. — A male, single, 57 years of age, was supposed to have had a pulmonary trouble for some time, but for only a few weeks had been acting peculiarly. He was restless and irritable, tearing up his bedding at night without giving any reason for doing so. He was said to be untidy and resistful.

On admission, Feb. 7, 1914, he was very weak and poorly nourished. He was scarcely able to talk in a whisper, and had a cough. He had a right scoliosis and a lordosis. There was dulness over both apices. He had a low, irregular temperature. Tubercle bacilli were never found in the sputum. He refused to co-operate, and when questioned would cover his head and refuse to explain himself. He seemed to be poorly oriented, but sense falsifications and delusions, while probably present, could not be brought out. He died March 13, 1914.

Autopsy, forty-six hours post mortem. Carcinoma of upper and lower thirds of œsophagus. Nodules over surface and peribronchial infiltration of right lung. Pia slightly thickened; amount of cerebrospinal fluid large.

The capillaries in the cerebellum were involved to very limited extent, and the changes were not very marked anywhere. In the ganglionic zone many of the small cells and about one-fifth of the Purkinje cells showed red granules. Many of the ganglion cells, stained poorly with cresyl violet, were misshapen and had the nucleus to one side. There was an increase of glia cells in the outer portion of the granule layer and in the ganglionic area.

These cases seem to possess sufficient clinical features to warrant including them in the exhaustive-infective group. Cases 1 and 2 are acute deliria; 3, diabetes with cerebral symptoms; 4, 5 and 6 are cases of longer duration in which the physical condition seems to bear a direct causative relation to the mental symptoms.

The changes found in the cerebellum may be summarized as follows: —

1. *Capillaries.* — A varying number of endothelial cells showed fine red granules, usually filling the whole cell. At times several adjoining cells were affected. The changes in the capillaries were confined largely to the granule layer and especially to the vicinity of the Purkinje cell belt, but a few of the vessels in the white, and also a few in the molecular, layer and in the pia showed affected cells in small number.

2. *White Matter.* — An occasional cell, especially near the granule layer, showed red staining.

3. *Granule Layer.* — A good many cells showed fine red granules surrounding the nucleus, the larger cells seeming to be especially affected. Changes were more marked toward the ganglionic zone.

4. *Ganglionic Zone.* — Many of the small cells in this area (glia cells) showed red granules thickly set in the protoplasm, in some cases nearly all the cells being affected. The number of Purkinje cells affected in different cases varies from few to nearly all. Fine, intensely red granules were thickly set in the protoplasm, the collection being supranuclear or to the side when the nucleus was dislocated, as was often the case.

The infranuclear portion was seldom involved unless the whole cell was. With the cresyl violet stain, the Purkinje cells showed poor staining of the tigroid bodies corresponding to the area stained red with Scharlach R. Also a varying amount of distortion of the cell body and nucleus was present.

Glia increase, especially in the Purkinje cell belt, was more or less apparent in chronic cases, these cells often showing fatty change.

5. *Molecular layer* showed no fatty deposit as a rule.

It is seen, then, that cell degeneration and fatty deposit is confined quite closely to the Purkinje cell belt, involving the capillaries and small cells, as well as the ganglion cells, especially in this region. In Cases 1, 2 and 3 (acute) the fat deposit involved a larger proportion of Purkinje and other cells, and the individual cells were affected to a more marked degree than was the case in Cases 4, 5 and 6 (chronic). In the more acute cases there was considerable internal disarrangement of the cell-structure, poorly stained areas in the chromatin, dislocation of the nucleus, but little, if any, glia increase. In the more chronic cases there were more shrunken and distorted cells, and there seemed to be an increase in glia cells that corresponded in a general way with the degree of Purkinje cell destruction. In Case

4 destruction was not marked, neither was the glia increased, while in Cases 5 and 6 both were quite advanced. The acute cases, then, showed in the Purkinje cell belt —

1. Marked fatty deposit.
2. Acute cellular changes.
3. No glia increase.

The chronic cases showed —

1. Less marked fat deposit.
2. Cellular change of a more chronic type, as shrinking, distortion and complete destruction.
3. Glia cell increase, corresponding to the Purkinje cell destruction.

Of other cases examined, two, clearly of arteriosclerotic variety, but complicated by carcinomata, showed fatty changes in the cerebellum corresponding in every way with those described, but of less degree. The cellular destruction was quite marked in these two cases, as was the glia proliferation in one of them. In two præcox cases there was no fat deposit in the cerebellum. In one case of Korsakoff's psychosis, fatty change in the cerebellum was confined to a few capillaries. A senile case showed changes similar to the arteriosclerotic cases. Two paretics showed no fat in the cerebellum.

So far as our investigation has extended we have found that: —

1. Fatty changes of a type described in detail above occur in the cerebellum, especially in the Purkinje cell belt, in conditions which interfere with nutrition of the brain, as arteriosclerotic brain disease, senile dementia, and in exhaustive infective psychoses.
2. The fatty changes are more marked in the toxic group than in others that we have examined.
3. The more acute the process the more marked is the fat deposit.
4. In chronic cases the fat deposit may not be large but as cell destruction advances the number of glia cells increases.
5. This study demonstrates in a new way the great lability of the Purkinje cell region, of which there has been increasing evidence from other methods of investigation for many years past.

THE YERKES-BRIDGES POINT SCALE; AS APPLIED TO CANDIDATES FOR EMPLOYMENT AT THE PSYCHOPATHIC HOSPITAL.*

By C. S. Rossy, Boston,

INTERNE IN PSYCHOLOGY, PSYCHOPATHIC HOSPITAL.

At the suggestion of Dr. Herman M. Adler, chief of staff, the Psychopathic Hospital has adopted the method of submitting to psychological examination every candidate for employment as clerk or attendant. It is the object of this paper to present the results obtained from the examination of the first sixty candidates.

Candidates.— The candidates, both male and female, were referred to the hospital by different employment agencies of Boston, with a few exceptions. The majority of them had attended grammar school, only 28 per cent having advanced to the high school. Their ages varied from eighteen to fifty-five, the average age being twenty-five.

Method.— After the candidate had applied for work to the superintendent of nurses, and his references had been verified, he was asked to report for a psychological examination. This examination consisted principally of the Yerkes-Bridges point scale, with the multiple choice,† and a few other supplementary tests given at the discretion of the examiner.

The point scale, devised in 1914 by Robert M. Yerkes and James W. Bridges, is a method for determining the degree of intellectual development. It comprises twenty tests, to each of which a certain credit is allotted. The subject is graded according to his reactions, with full, partial or no credit; when the examination is completed the sum total of these credits indicates his mental grading in percentage.

Results.— From February to June, 1915, sixty candidates were examined. With the exception of two, who applied for position

* Read in abstract at the Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being M. C. M. D. Contribution No. 1916.18 (whole number 160). The previous contribution was No. 1916.17 (159), by Egbert W. Fell, entitled "Fatty Degenerative Changes in the Purkinje Cell Belt in Exhaustive Infective Psychoses," Boston Medical and Surgical Journal, Dec. 7, 1916. Reprinted from the Boston Medical and Surgical Journal, Vol. CLXXV, No. 23, pp. 822-824, Dec. 7, 1916.

† A method devised by R. M. Yerkes for comparative study of individual reactions of human and infrahuman subjects.

as clerk, all of the applicants solicited work as attendants. The following table shows the classification of these candidates according to their degree of intelligence: —

TABLE I. — *Classification of Candidates according to Mentality.*

	Per Cent.
Normal,	63
Slightly subnormal,	17
Intellectually inferior,	20

In the normal group, which includes only 63 per cent of the whole, are found all applicants who obtained a score above 82 points, that is, who graded above the standard for the mentality of fifteen years. (See "A Point Scale for Measuring Mental Ability." [1]) Of these presumably normal candidates —

	Points.
25 obtained	82–90
9 obtained	91–95
4 obtained	96–98

In the second group (17 per cent of the whole), comprising candidates of slightly subnormal intelligence, are included those applicants who obtained between 76 and 82 points credit.

In the third group we find 20 per cent of the candidates. These graded below 76 points, and their reactions indicated intellectual inferiority. According to the norms of the point scale (see "A Point Scale for Measuring Mental Ability" [1]) these subjects did not attain a mental rating equal to that established for the intelligence of a twelve-year-old child, namely, 77 points. Of the subjects included here —

	Points.
7 obtained	60–69
5 obtained	70–75

It is noticeable that a history of alcoholism, immorality or delinquency was obtained from many of these individuals.

The accompanying charts represent, respectively, the distribution of mental grading and the distribution of education received by the applicants examined.

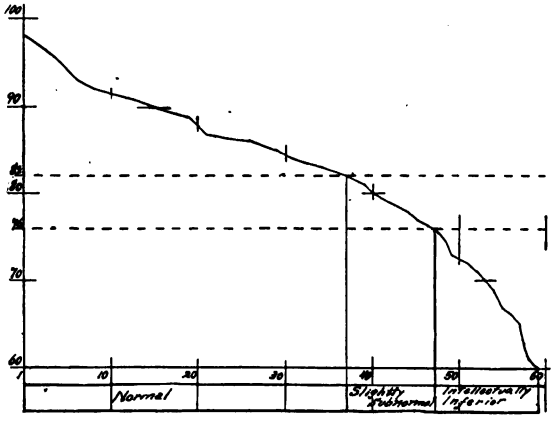


CHART I. — Distribution curve representing grading of 60 candidates for employment. (Ordinates = points scored; abscissae = number of subjects.)

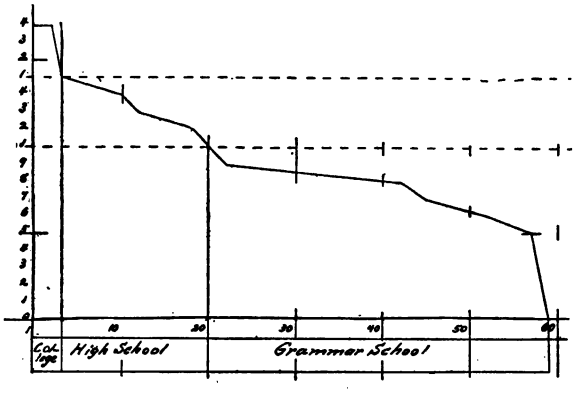


CHART II. — Distribution curve representing education of 60 candidates for employment. (Ordinates = school years; abscissae = number of subjects.)

Table II has been arranged to illustrate the variation in the responses of the sixty subjects to one of the twenty tests of the point scale, namely, test 13, in which the subject is required to name as many words as possible in three minutes.

TABLE II. — *Rate of Free Associations.*

NUMBER OF WORDS.	Number of Subjects.	NUMBER OF WORDS.	Number of Subjects.
20–29,	3	70–79,	14
30–39,	3	80–89,	10
40–49,	4	90–99,	6
50–59,	6	100–126,	7
60–69,	7		

From the above table we obtain the following results: —

Mode, ... 70–79
Median, ... 70–79

The exact median proves to be 75 words, which coincides with the minimum requirement for a normal adult. The lowest number of words said by any subject was 21, the highest number 126. It is interesting, also, to note that 26.6 per cent of the subjects fail to meet the Binet-Simon requirement for the twelve-year-old mentality.

The following table presents the individual record of each candidate: —

TABLE III. — *Record of Subjects Tested.*

SUBJECT.	Sex.	Age.	Point Scale Score.	Education.	Classification.
A,	M	35	80	College graduate.	Slightly subnormal.*
B,	M	29	96	High school, 2.	Normal.
C,	M	21	90	Grammar school, 8.	Normal.
100,	F	20	89	High school graduate.	Normal.
101,	M	29	72	Grammar school, 6.	Intellectually inferior.
102,	M	28	98	Grammar school, 8.	Normal.
103,	M	34	69	Grammar school, 8.	Intellectually inferior.
104,	M	26	79	Grammar school, 7.	Slightly subnormal.
105,	M	26	81	Grammar school, 8.	Slightly subnormal.
106,	M	27	88	Grammar school, 8.	Normal.
107,	M	24	93	High school graduate.	Normal.
108,	M	28	75	Grammar school, 3.	Intellectually inferior.
109,	M	34	96	Grammar school, 8.	Normal.
110,	M	34	81	Grammar school, 5.	Slightly subnormal.

* History of epilepsy was obtained from this subject.

TABLE III. — *Record of Subjects Tested* — Continued.

Subject.	Sex.	Age.	Point Scale Score.	Education.	Classification.
111, ...	M	25	89	Grammar school, 9.	Normal.
112, ...	M	24	89	Grammar school, 8.	Normal.
113, ...	M	35	91	Grammar school, 8.	Normal.
114, ...	F	23	85	High school, 3.	Normal.
115, ...	M	27	96	Grammar school, 8.	Normal.
116, ...	F	23	82	Grammar school, 8.	Normal.
117, ...	M	29	85	Grammar school, 8.	Normal.
118, ...	M	26	92	College graduate.	Normal.
121, ...	M	18	89	High school, 2.	Normal.
122, ...	M	21	76	Grammar school, 8.	Slightly subnormal.
124, ...	F	28	87	High school, 4.	Normal.
125, ...	M	40	83	High school graduate.	Normal.
126, ...	M	19	91	High school, 3.	Normal.
127, ...	M	26	78	Grammar school, 9.	Slightly subnormal.
128, ...	M	30	86	Grammar school, 6.	Normal.
129, ...	M	34	86	High school graduate.	Normal.
130, ...	M	22	82	College, 1.	Normal.
131, ...	M	23	72	Grammar school, 5.	Intellectually inferior.
132, ...	F	23	79	Grammar school, 8.	Slightly subnormal.
134, ...	M	55	69	Grammar school, 5.	Intellectually inferior.
135, ...	M	31	66	Grammar school, 6.	Intellectually inferior.
136, ...	M	21	93	High school, 1.	Normal.
137, ...	M	23	61	Grammar school, 7.	Intellectually inferior.
138, ...	M	20	78	Grammar school, 5.	Slightly subnormal.
139, ...	M	23	83	High school, 2.	Normal.
140, ...	F	35	84	Grammar school, 8.	Normal.
141, ...	M	24	90	Grammar school, 8.	Normal.
142, ...	F	22	95	High school, 1.	Normal.
143, ...	F	22	67	Grammar school, ?	Intellectually inferior.
144, ...	M	37	90	High school, 2.	Normal.
145, ...	M	30	91	High school graduate.	Normal.
146, ...	F	22	60	Grammar school, 6.	Intellectually inferior.
147, ...	M	24	86	Grammar school, 6.	Normal.
148, ...	M	35	85	Grammar school, 8.	Normal.
149, ...	M	29	84	High school, 2.	Normal.
150, ...	M	23	82	High school, 2.	Normal.

TABLE III. — *Record of Subjects Tested* — Concluded.

Subject.	Sex.	Age.	Point Scale Score.	Education.	Classification.
151, ...	M	27	86	High school graduate.	Normal.
152, ...	M	32	91	Grammar school, 6.	Normal.
153, ...	M	21	86	Grammar school, 8.	Normal.
154, ...	M	22	76	Grammar school, 8.	Slightly subnormal.
155, ...	M	38	65	Illiterate.	Intellectually inferior.
156, ...	M	25	71	Grammar school, 7.	Intellectually inferior.
157, ...	M	22	92	Grammar school, 8.	Normal.
158, ...	M	21	77	Grammar school, 6.	Slightly subnormal.
159, ...	M	29	73	Grammar school, 5.	Intellectually inferior.
160, ...	F	23	88	Grammar school, 8.	Normal.

CONCLUSIONS.

The following conclusions are drawn from the results presented in this paper: —

1. A high percentage of defective and otherwise mentally incompetent individuals is found among candidates seeking employment as attendants in State hospitals.

2. It is desirable that each candidate for employment should be submitted to a systematic psychological examination for estimating his general intelligence.

3. These results, though preliminary, emphatically indicate that the Federal and State civil services might well consider the plan of using reliable intelligence tests in their routine examinations.

REFERENCE.

1. YERKES, R. M., BRIDGES, J. W., HARDWICK, R. S.: "A Point Scale for Measuring Mental Ability," Baltimore: Warwick & York, 1915.

THE INTENSIVE GROUP OF SOCIAL SERVICE CASES.*

By Mary C. Jarrett.

CHIEF OF SOCIAL SERVICE, PSYCHOPATHIC HOSPITAL.

When the social service in this hospital was begun, two years ago, one year after the hospital opened, our first report was an orientation study of our function; next an estimate was attempted of the amount of social work there would be; and this was followed by further notes on the nature and size of our problem, with an estimate of the number of social workers who would be needed.† This year is evidently the time for a report on what we have done.

The nucleus of all our work is the intensive group of cases, and this report will go into detail in regard to them only.

By intensive, we mean those cases in which the social service department has assumed responsibility for making an inquiry into the social condition of the patient and his family, and for taking steps to secure the greatest measure of social well-being possible for them.

In another group, known as slight service cases, the assistance given by the social service does not involve an inquiry into the patient's general situation beyond the apparent facts, nor responsibility beyond the particular service rendered. These two divisions of social case work now seem to be generally recognized in most hospital social service departments.

In our two years' existence we have dealt with 440 cases in the intensive group, of which 68 are still under care. It happens

* Read at Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being M. C. M. D. Contribution No. 1916.19 (whole number 161). The previous contribution, 160, 1916.18, was by C. S. Rossy, entitled "The Yerkes-Bridges Point Scale: as Applied to Candidates for Employment at the Psychopathic Hospital," Boston Medical and Surgical Journal, Dec. 7, 1916. Reprinted from the Boston Medical and Surgical Journal, Vol. CLXXV, No. 23, pp. 824-830, Dec. 7, 1916.

† Officers of the Psychopathic Hospital, medical and social, have published the following articles on social service and allied subjects: —

1914.4. E. E. Southard. "Feeble-mindedness as a Leading Social Problem."

1914.5. Mary C. Jarrett. "The Function of the Social Service of the Psychopathic Hospital."

1914.19. A. Warren Stearns. "The After-Care Program and Results of the Psychopathic Hospital."

1913.33. A. Warren Stearns. "Notes on After-Care and Moral Suasion Work with Alcoholics in the Out-Patient Department of the Psychopathic Hospital."

1913.7. Mary C. Jarrett. "Statistical Notes on the Need of Social Service in the Psychopathic Out-Patient Department."

1914.20. Mary C. Jarrett. "Further Notes on the Economic Side of Psychopathic Social Service."

1915.26. Helen M. Wright. "Examination and Prophylaxis for Syphilitic Patients and Their Families: Methods of Investigation at the Psychopathic Hospital, Boston, Mass., 1915."

that 440 is somewhat above the number of cases which, according to our estimate two years ago, two social workers would expect to deal with in two years. The hospital has only two social workers on the pay roll of the State; but the help of students and other volunteers and several privately paid workers has made it possible to develop, in addition, several other lines of work, — 1,238 cases have been dealt with in the slight service group; a men's club for discharged alcoholic patients has met once a month; a routine system of following up all out patients who fail to report when due has been in operation a year and a half. Two pieces of work have been undertaken with the combined ideas of treatment and research, — first, a study of opportunities for psychopathic patients in industry; and second, a routine method of securing examination of the families of all syphilitic patients.*

The 440 intensive cases included 186 men, 185 women and 69 minors. The following types of mental disorder and defect were represented: —

Alcoholic,	74
Backward,	2
Delinquent,	16
Drug habit,	3
Epilepsy,	16
Feeble-mindedness,	35
Hysteria,	10
Insanity,	147
Neurasthenia,	10
Not insane,	47
Psychoneurosis,	22
Psychopathic personality,	7
Syphilis,	18
Unclassified,	14
All other diagnoses,	18
Not made,	1

The largest group were the insane, — 36 + per cent.

	Per Cent.
Alcoholic,	17
Psychoneurotic,	11+
Feeble-minded,	8
Epileptic,	3
Diagnosed as not insane,	10+

* Examination and Prophylaxis for Syphilitic Patients and Their Families: Methods of Investigation at the Psychopathic Hospital, by Helen M. Wright, Boston, Mass., 1915.

The remaining 14 per cent, covering all other diagnoses, included syphilis, drug habit, delinquency, etc.

The different types of action taken may be classified as follows: —

In 139 cases advice was given.
In 124 cases history needed by the doctors to make a diagnosis was obtained.
In 101 cases the patient was kept under supervision.
In 39 cases the patient was referred to another agency.
In 23 cases arrangements for the patient's discharge were made.
In 14 cases other members of the family were brought under care.*

By giving advice, we mean outlining a plan and, if necessary, assisting the patient or his family to follow it. An illustration of this class is the case of a backward child of eight in a family that contains four other defectives. The little girl is to be sent to the country for the summer. She is the original patient, but we now have the epileptic father as an out-patient. We keep general oversight of a feeble-minded son who is working, and we expect to persuade the father to make application to the School for the Feeble-minded for a daughter of fourteen. A younger son is under observation in the out-patient department, and the overburdened mother, by our advice, comes there also for reassurance in regard to her own mental condition.

An example of history necessary for the diagnosis is the case of a woman of thirty, daughter of a rag-picker, who had been supporting himself and her and his blind wife by begging, with the story of his daughter's broken-down health.

She was at first thought to be hysterical and was about to be returned to her father, but the history showed marked deterioration and she was committed to a State hospital with the diagnosis of dementia præcox.

Arrangements made for a patient's discharge may be illustrated by the case of an Irish servant girl, sent here for observation because she refused to eat or speak. She was pregnant and subnormal in intelligence. After investigation it was decided to secure her admission to a maternity home. The baby died and the girl is doing well in a position under the oversight of the home.

An example of a case referred to another agency is a girl of fifteen, who had run away from home disguised as a boy. She

* See Appendix for illustrative cases.

was uncontrollable at home, and her parents were on the point of sending her to a reformatory. She was diagnosed as not insane and not defective. Under the care of the Children's Aid Society she has remained at home, worked regularly and attended night school, and is much improved.

To illustrate prophylaxis for other members of the family, the case may be given of a man with general paresis, whose wife and four children were brought in for examination. One child, a nervous, high-tempered boy, was put under treatment for syphilis.

The class of supervision cases have been left until last because they are the most intensive part of the group, and I want to speak of them in some detail. By supervision we mean continuous oversight of a patient over a considerable period, from three or four months, to an indefinite time.

For example, a girl of sixteen, who was admitted to the house two years ago twice in one month, with hysterical convulsions, is still under supervision. She has been educated in the control of herself, and has been helped financially so that she could study dressmaking. She has had several convulsions, but they have been much less severe and at longer intervals; and, in general, she is now in good health and good spirits.

The number of supervision cases dealt with was 101,—48 men, 41 women and 12 children; 88 were at one time house-patients and 12 were out-patients only.

Improved,	59
Not improved,	42
Readmitted to the hospital and again discharged,	18
Committed to a State hospital,	11
Went to reformatories,	3
Went to an almshouse,	1

Of the 59 improved patients, 7 were readmitted to the house and discharged after a short period. In 22 cases other members of the family needed assistance. For example, in the case of the hysterical girl just referred to, the father, who is alcoholic, has been made to report to the out-patient department, and is somewhat improved. The purpose of our supervision may be classed as *after-care* in 37 cases, that is, no marked improvement in the patient's mental condition could be expected; and as *prevention* in 64 cases, in which, under favorable environmental conditions, the patient might be expected to recover or to show marked improvement.

Some conclusions drawn from the study of 101 supervision cases are as follows: —

1. The value of temporary residence in the hospital as a therapeutic measure in some cases, shown in 7 of the 59 improved cases.

2. The possibility of a greater proportion of improvement than the 58 per cent shown in this group through more careful selection of cases, since it is possible with a limited staff to care only for selected cases.

3. More attention to out-patients in the earlier stages of mental difficulties, with a view to prevention. It is probable that in our supervision work there should be a smaller proportion of after-care than is indicated by the 37 cases in this group, compared with 64 cases for prevention.

4. A routine examination of every patient to determine his need of social care, to be held in view as an object when funds become available for a larger staff.

A beginning has been made in tabulating the social interests involved in psychopathic social service cases, following the division outlined by Roscoe Pound in his articles on "Interests of Personality," published in the "Harvard Law Review," February and March, 1915, as an advance chapter of his projected book, "Sociological Jurisprudence." He distinguishes three classes of rights or interests of the individual in relation to the environment,— individual, social and public. The study that we are making will be reported upon later in detail, and one conclusion only seems interesting to be mentioned now. Among the 440 cases studied, individual interests are involved to a greater extent than either of the other two classes, 647 times; social interests come next and are involved 544 times; while public interests are involved 409 times. The indication, therefore, is that the concern of psychopathic social service is primarily with the care of the individual; next, with the welfare of society, and finally, with the public good as represented in public institutions.

APPENDIX.

ILLUSTRATIVE CASES.

GROUP I. CASES IN WHICH THE PATIENT WAS KEPT UNDER SUPERVISION.

CASE 1.— Bessie E., a girl of nineteen, was referred to the social service for supervision when discharged from this hospital about a year and a half ago. Her diagnosis was hysteria, with a question of dementia præcox. She believed that her face was so ugly and "silly" that nobody could bear to look at her, so she would sit shrinking into a corner with her head turned against her shoulder, twitching and wriggling. She spoke only in a whisper, haltingly, and with a great effort. She was unfit for any ordinary occupation and very unhappy.

Her family consists of the mother, who has had two attacks of manic-depressive insanity, an excitable sister who works as a bookkeeper, a brother in school, and the mother's mother, seventy-five years old. The mother and sister were oversolicitous about Bessie and worried her by fussing over her. It was arranged that she should live with an aunt near the hospital and attend a cooking class and a gymnasium class at a neighborhood house. She also came to the hospital regularly for knitting lessons. In the beginning it took her a full minute or more to make one stitch. She improved and was happier. In the spring she was sent to a convalescent home in the country where her sister paid her board, and she gained noticeably in self-control while there. Arrangements were then made for her to board in a small working girls' home and work secured for her at a playground to play with the children, for which she was paid through a special donation. It is now planned to send her for two months to a girls' camp, under the management of a woman physician, money for her expenses having been raised by private subscription. She has shown marked improvement, and our hope is to continue to provide a thoroughly favorable environment until she has either recovered from her acute symptoms, or has shown a decided form of mental disease.

CASE 2.— Harriet Q., aged fifty-five, heard the big clock on her mantel talk to her in a vindictive manner. She had twice in two months become so violently enraged by it, that her husband had had to send her to the Psychopathic Hospital. When the time came for her second discharge an effort was made to alter her home life, so that she would not be alone and unemployed as much as she had previously been. She took daily exercise out of doors, and through the co-operation of her relatives was visited, and kept busy. She reported regularly to the out-patient department every

two weeks, and was no longer troubled by the clock. Her diagnosis was senile dementia.

Case 3.— James R. was ready to be discharged, with a diagnosis of locomotor ataxia. He had been sent here because he had suicidal tendencies. He had been a teamster, and lived, with his wife, in the family of a married stepdaughter, who has three children. We persuaded him to go to the State Infirmary because the doctors advised his having hospital care. After six weeks he went home because he was homesick. He spoke no English and could not make friends. The support of the patient was a problem, as the son-in-law was already overburdened. The overseers of the poor were applied to, and gave $2 a week. Arrangements were made with the district doctor to supervise the patient, and when, in two months, he had one of his attacks, the doctor sent him to the City Hospital, were he stayed two weeks. Recurring attacks of intense pain, with suicidal ideas, are to be expected. Attempts to secure some light employment for him resulted in a course in chair-caning at the Industrial School for Crippled Children. He did some work there until the school closed in the summer, and then a position was found for him in a factory, where, though the conditions were as favorable as possible, the strain was too much for him. He is very helpful in work about the house, and is now making a grindstone with which he hopes to get work sharpening knives.

The weekly visit to the family has reassured them in regard to their fear of suicide, and has also been the occasion for some practical help and advice. The custom of keeping bantam hens in the house was eliminated, and later a family of kittens disappeared after comment from the visitor. A bed was supplied for two of the children who had been sleeping with the patient and his wife.

The board of health found the family overcrowded and told them to move. This trial was averted, as the agent of the board was persuaded to remeasure the tenement, and discovered that it was his mistake. As the family were obliged to eke out their expenses by having two boarders in one of their rooms, they were more crowded than they should be, and we were hoping to do away with the boarders by securing more financial aid for the family, when the daughter decided to move to another tenement with her family. She needs an operation badly, which we hope to persuade her to have, after the baby recovers from an attack of dysentery, which she had this summer. She had been left weak and thin, and is still under the care of the district doctor and nurse. A vacation in the country was secured for her and two of the children during the hottest weather.

Case 4.— John O., a tailor, aged thirty-nine (diagnosis, dementia præcox, catatonic), had a wife and two children to support. His former employer, for whom he had worked thirteen years, was afraid of him when he returned from the hospital, and was quite satisfied with a younger man who was doing the patient's work for less money. Work had been scarce, and there seemed to be no place for a tailor who had once been called insane. Several visits from the agent were made to the former employer

before he could be convinced that the patient was now in condition to return to his work. He did, however, take him back and has allowed him a half day monthly to report at the out-patient department of the hospital.

CASE 5.— Charles O., seventeen years old, was before the court in a near-by town for setting fires. He had set three different fires within three months, each time playing the hero by discovering the blaze and helping to put it out. He was otherwise a good boy, mechanically inclined, but poor in school work. Before committing him to a reformatory, the court sent him to the out-patient department for a psychological examination. In this he ranked above the normal, but showed a tendency to react too quickly, making conclusions before he had considered the whole situation. The court was advised to put him on probation and, as he had won general disfavor in his home town, to send him to Boston, to be under supervision of the hospital social service. He secured good lodgings, where he would have the companionship of young men of his own age, and temporary work, which would give him a chance to show what he could do. He gained the friendship of his employer, and appeared to be making good, when without warning of any mental disturbance, he set a fire in the building where he lived, and was again the hero of the occasion. As he had not improved in an environment thoroughly favorable, the court decided to treat him as a defective. After a period of observation in a State hospital, he was committed to a school for the feeble-minded.

CASE 6.— John L., aged thirty-nine, a man of agreeable manners and appearance, educated in Ireland, where he nearly completed a medical course, is now employed by a large drug firm, who say he is extremely valuable to them.

He has been married six years and has two children. Two and a half years ago he came to the United States, and a year and a half later brought his family. At intervals since his marriage he had had spells of drinking, when he was violent and abusive. During an attack, which lasted seven months, he required the care of male nurses.

He was brought into the hospital by the police because he had been abusive to his wife, threatened to choke her, and had thought people in adjoining apartments were talking about him. After two weeks he had recovered his mental powers. His employer, on the strength of assurances from the hospital, gave him back his position. Communication was established with his wife, who was seen at intervals at their home and at the hospital. She is an intelligent woman and realizes that there is danger of her husband's doing harm to her and the children when he is drinking. As she is without relatives or friends in this country, she has been especially grateful for the moral support of the social worker.

In June she came for advice, saying that the patient was acting strangely, and had been drinking a little. She was told to have the police bring him into the hospital again at the first sign of violence. Two weeks later she sent a messenger for advice as the patient was drinking heavily and had threatened her. She was unwilling to call in the police unless it was neces-

sary. We then arranged for the police to bring him into the hospital. He cleared up in ten days, again returned to his position, and has been in good condition since.

Group II. Cases in which Advice was given.

CASE 1.— Arthur R., an Italian, thirty-four, became violent at home, and through this hospital was committed to a State hospital, with the diagnosis of dementia præcox. His wife and two children, aged five and one-half and four years, were given lodgings with a relative who could afford the room, but had little means with which to provide food and clothing. The wife was restless, and worried constantly about her own dependence and her husband's illness. Work was, therefore, found for her in a candy factory, where she earned good wages as a chocolate dipper. The children were admitted to a day nursery in order to relieve the relative of their noise and the quarreling between them and her own children. Subsequent visits found the wife happy in being able to contribute toward her own support, and the relations between the relative and the family were unstrained.

CASE. 2.— Beulah V., a quiet, refined woman, unmarried, was sent to the Psychopathic Hospital as a voluntary patient through a social agency, in the hope that a diagnosis might aid them in making future plans for her. It had seemed impossible to find her any work that she liked or would keep.

After a few days in the hospital she decided not to remain, but was persuaded to stay as long as the doctors advised. After observation for nearly a month a temporary diagnosis of psychoneurosis was made, with the question of a possibility of early dementia præcox. She returned to the social agency, tried several kinds of work, but finally gave up trying and went to live with an aunt. After a few weeks she refused to eat with the family, shut herself in her room alone, became suspicious of her aunt, and would not talk. The aunt, an intelligent woman, was instructed how to deal with the patient. She is keeping a diary of her conduct and changing moods, and in case she becomes unmanageable, will notify us, so that, if necessary, she can be brought back to the hospital.

CASE 3.— Edward L., a feeble-minded boy of fifteen, was a great care to his mother, a woman of refinement, who had to support him and another child, a bright girl of ten years. Edward was masturbating badly, and had become so uncontrollable at times that he would beat his head against the wall and act more like an animal than a boy. A special effort was made to have him admitted to the already crowded school for the feeble-minded, and within three months the patient was having the care and training that he needed.

CASE 4.— Anna I., a girl of seventeen, with a diagnosis of imbecility, came to the out-patient department with her mother, who asked for help in getting her into the School for the Feeble-minded, as she could not manage her. Over a year before an application had been filed. We

found that the girl could be received at Wrentham, and then the mother refused to sign the commitment paper. The father was sick in a hospital, the mother was too sick to be summoned into court, and the neighbors were supplying food and fuel. The Jewish Charities promised aid. After repeated efforts for two months, during which the mother changed her mind many times, she was persuaded to sign the commitment paper, and the girl was sent to Wrentham.

Group III. Cases in which the Patient was referred to Another Social Agency.

Case 1.— Martha O. The Brookline Court sent for observation a girl of fifteen, stating that she would stay away from home all day and often all night, and had recently gone to a hotel with a young man who promised to take her to New York. A month before she had attempted suicide. The patient was not insane nor intellectually defective. Her mother, a capable woman, employed in a position where she is well thought of, was at the end of her resources in managing the girl. By appointment, an agent from the Children's Aid Society came here to meet the mother. She has since had oversight of the girl, and reports that she has a position at clerical work in the same place with her mother, at $8 a week; that she goes to gymnasium, and is doing very well.

Case 2.— Bessie N. had had an illegitimate child, and in the course of her efforts to find the deserting father, with the hope of making him marry her, her mind had become slightly unbalanced. In the hospital she recovered quickly.

With the help of her sister, who considered such a marriage inadvisable, and with advice from the Legal Aid Society, Bessie was persuaded to give up her search and accept the care of her child herself. It was found that she had an acute infection of gonorrhea. On her discharge from this hospital she was referred to the proper department of a general hospital through their social service department, and she has been reporting regularly for treatment.

Case 3.— Julius R. was brought in by the police, because he was found trying to escape from imaginary people who were throwing things at him. The patient told a story that his wife was unfaithful to him and had driven him from their home in Brockton. He admitted that he was alcoholic, but claimed his wife was slack, and neglected both him and the children. The Society for the Prevention of Cruelty to Children in Brockton were asked to make inquiries about the patient, and to look into the condition of the children. The patient was transferred to Taunton State Hospital and later allowed to go home. The S. P. C. C. have the family under supervision, and have reported to us that the patient is apparently doing much better, and the wife, a woman of low mentality, after repeated efforts, has been made to clean up the house. The St. Vincent de Paul Society are paying the rent until the patient gets a steady job.

Case 4.— Timothy V. The patient, while in the hospital, said he was worried because his wife and two children had no means of support. A

visitor was at once sent to see the wife, and though she was out, learned from the landlady that this was true. The Associated Charities were asked to help her, and the wife was seen, when she came in to visit her husband, and was put in communication with their office. She was also directed to take one of the children to the Children's Hospital. The patient was discharged to the out-patient department with a question of cerebrospinal syphilis. He was later committed directly to the Boston State Hospital, and the Associated Charities continued to assist the family.

Group IV. Cases in which Prophylactic Measures were taken for Other Members of the Patient's Family.

Case 1.— Lester A., a feeble-minded boy; should have been sent to a school for special training, but as there was no vacancy, it was necessary to supervise him in his home. A few visits brought out the fact that his mother was suffering from violent headaches and "rheumatism." After an examination in the out-patient department, she was advised to take hydriatric baths, and gradually improved. It was also learned that her husband, a painter, was supposed to have been so affected by a fall on his head some ten years before that his friends had not considered him normal since. He had been getting gradually worse, and had been suffering from "spells" of some kind. After much persuasion he also came to the out-patient department, and his examination showed a low grade of mentality and signs of lead poisoning. He was sent to another hospital for treatment. The mother's headaches have improved. The father was operated upon for appendicitis, and during his convalescence the family was aided financially through two charitable agencies. On recovery he obtained a position in the park department. The original patient, Lester, is still at home and doing fairly well in a class for backward children.

Case 2.— Lester K., twelve years old, two months before his admission had become blind after a convulsion. He appeared frightened, his speech was defective, and he had lost flesh rapidly. The Wassermann reaction for syphilis was found to be positive, and a diagnosis was made of juvenile paresis. His parents took him home, although they were advised to have him committed to a State hospital for the insane. The mother and two brothers were examined in the out-patient department, and given the blood test for syphilis. The younger boy of six showed a negative reaction. In the case of the older boy, fourteen years, the test was unsatisfactory, and he is to return for a second test and also for a psychological examination, as he is reported to be "dull." The mother's examination has not yet been completed.

The father was also examined and found to have a positive Wassermann reaction. Inquiry from a physician showed that he had previously been treated for syphilis. He was advised to have further treatment at once.

The father's physical condition prevented his earning enough to support the family, and the mother was obliged to go out to work. The care of

Lester was too great a burden, but the parents were unwilling to send him to an institution. As the home of the family is in another city, the case was referred to the local Associated Charities. They report that the father is under the care of a physician, and the mother is partly persuaded to allow Lester to be sent to a State hospital.

Case 3.— Howard R., a married man of twenty-eight, with cerebro-spinal syphilis, is receiving salvarsan treatment. His wife and two children were given the Wassermann test for syphilis in the out-patient department. The children showed a negative reaction. The reaction of the wife was positive and she was persuaded to put herself under treatment at a general dispensary. The patient's treatment quickly exhausted his small savings, and the social service furnished the money for salvarsan until his mother could be persuaded to pay for it. As the patient's illness left the family without support, they were referred to the overseers of the poor, and received temporary aid until they were transferred to the care of the mother's aid department of the State Board of Charity.

Group V. Cases in which History required for Diagnosis was obtained.

Case 1.— James R. told a story of abuse and unfaithfulness on the part of his wife, claiming that she was a "devil at home" and wanted to get rid of him. When she had him arrested for non-support he became so excited, because he said everybody believed her instead of him, that he made a scene in court, which resulted in his being sent here for observation. He had been once before in an insane hospital, where no definite psychosis was found. At that time he had attacked his wife when drunk. He gave no evidence of a psychosis when here, and was discharged. He went on a cruise, and on his return was immediately sent in by the police. This time an investigation was made by the social service. Careful inquiries established the fact that the wife was a good, hard-working young woman struggling bravely, with the help of her own family, to bring up her children nicely; was in terror of her husband, and had suffered ill-treatment from him. Indications of mental disorder were found in the history, and the patient was committed to an insane hospital. A copy of the social service history was sent with him.

Case 2.— James G. fractured his skull by falling from a scaffolding at his work, and a year later was sent to the Psychopathic Hospital for observation. It was difficult to tell to what extent his dizziness, lack of self-control and slight paralysis of the right arm were induced by the $9 a week which he was collecting under the employer's liability act. All data at first pointed toward a diagnosis of psychopathic personality. A careful inquiry later into his character, his general health and the events preceding and following the accident made it possible to make the diagnosis of traumatic psychosis.

Group VI. Cases in which Arrangements were made in Order that the Patient might be discharged.

Case 1.— Caroline O., an old woman, was reported to the overseers of the poor by a neighbor, who found her living alone in a tenement in destitution. The agent thought her manner strangely confused, and called a physician, who sent her here for observation. Inquiries showed that she had deserted her husband when her children were young, and had since lived alone, drinking steadily and consorting with disreputable people. She had resisted all the efforts of her daughter to induce her to live respectably.

After it was determined that she was not suffering from a psychosis, the question was, where was she to go? She was physically weak, and confused and rambling in mind, requiring, the doctors said, hospital care. Her daughter was sent for, and came with her husband. They had given up the filthy tenement in which the patient had lived, so that she might not return to it. They were not able to afford the expense of a nurse for the patient, and she was too unmanageable to be taken into their home, so that they were advised to send her to the State Infirmary. Her admission was arranged for, and, after a stubborn resistance, the patient was persuaded to go.

Case 2.— James B., sixty-five years old, came into the hospital in a disoriented condition. A month previous he had been knocked unconscious by an engine while at work. He was a moderate drinker, but had been a steady worker for the railroad twenty-four years. His mind cleared slowly, and by the middle of the second month he was ready to be discharged. Inquiry showed that none of his five children were in a position to give him a home, and all agreed that he ought not to return to his second wife, a chronic alcoholic. Arrangements were, therefore, made to send him to his brother in Nova Scotia. There he spent four months on a farm and gained strength, so that when he came back in the fall he returned to his work with the railroad. He lives with another brother in the city and reports to the out-patient department.

Case 3.— Harriet L., nineteen years old, was brought to the Psychopathic Hospital for observation, at the suggestion of the family physician. She had been in the habit of stealing from members of her family and friends ever since she was a small child, and recently had had immoral relations with several men. Unless she could support herself her brother was not able to have her live in his family longer; but because of her habit of stealing she could not be recommended to employers.

She was found to be a high grade moron, and institutional care was recommended. An application was sent to a school for the feeble-minded, and the patient's name was put on an already long waiting list. Later, through our representations, she was listed among the "urgent" cases. Meanwhile, it was necessary to keep her under custodial restraint somewhere, and a small private institution finally agreed to take her

temporarily, making an exception to their rule not to receive mental defectives.

At the end of three months, however, the matron said that she could not keep the girl any longer. She had plotted to escape with another girl, and her influence in the home was bad. As no other place could be found, she was sent to the State Infirmary until she could be admitted to the School for the Feeble-minded. There she took such a violent dislike to the women with whom she was associated that she was given night work, so that she would not have to be with them. At the end of three months she was admitted to the school, where she is said to be mingling well with the older girls, and seems to be happy.

Case 4.— Walter A., an unmarried man, was sent for observation, because the woman with whom he boarded claimed that he had violent fits of temper, when he would destroy clothing and furniture, and because, as he also lacked all ambition and initiative, he had been suspected of mental defect.

Inquiries from neighbors in the country town where the patient had boarded showed that he was not considered harmful by neighbors who saw him daily. The landlady was reported to be a woman with whom "an angel from heaven" could not live peacefully. On the wards his conduct was excellent. The nurse in charge reported that he was one of the most willing and obedient patients she had ever had. The diagnosis of dementia præcox simplex was made, and the patient was not considered committable.

As the patient's mother had left him some property, in charge of a guardian, board could be paid for him at $5 a week. A place in the country was found in the family of a widow and her daughter, where he could help with the chores, and perhaps obtain some work in the neighborhood. We have received several letters from the patient, telling how much he likes his new home. The family are well satisfied with him and are delighted that they have a permanent boarder.

ROUTINE MENTAL TESTS AS THE PROPER BASIS OF PRACTICAL MEASURES IN SOCIAL SERVICE: A FIRST STUDY MADE FROM 30,000 CASES CARED FOR BY 27 ORGANIZATIONS IN BOSTON AND SURROUNDING DISTRICTS.*

By Helen M. Wright,

social worker, psychopathic hospital, boston.

PART I.

The Need for Social Agencies to standardize their Use of Mental Tests.

In a brief discussion of social service, which was included in a reading before the American Medical Association of June, 1913, Dr. Southard of the Boston Psychopathic Hospital said, "Progress should be made in every community to determine the dimensions of the social problem as it affects the psychopath."[1] To this end the social service departments of the psychopathic hospitals and clinics are endeavoring to work. On the other hand, economists and social workers have yet to determine the dimensions of the problem of the psychopath, as he affects society. The purpose of this paper is to discuss particularly the latter phase of mental welfare work.

More and more often social agencies are trying to determine to what extent mental disorders are responsible for their particular problems. This knowledge is being sought by organizations attempting to prevent the evils undermining social welfare, as well as by those working to alleviate and improve poor conditions, whether for the individual or for the public. In the endeavor to get opinions on individual cases, these organizations are turning to the mental specialists, to psychological clinics and to psychopathic wards and hospitals, for the diagnoses which will indicate to them the best course of action to be pursued in their respective problems. During the fiscal year of 1913-1914 of the psychopathic department of the Boston State Hospital,[2] 679 patients from a total of 3,054 admitted to the house and outpatient department (or one in every four admissions) were

* Read at the Third Annual Conference on the Medical and Social Work of the Psychopathic Hospital, June 18, 1915. Being M. C. M. D. Contribution No. 1916.20 (whole number 162). The previous contribution was by Mary C. Jarrett (1916.19, 161), entitled "The Intensive Group of Social Service Cases," the Boston Medical and Surgical Journal, Dec. 7, 1916.

known to have been sent at the instigation of court officers, churches, settlements, social service departments in stores, family rehabilitation, relief and child-caring agencies. This number shows an increase over the figures of the previous year, due, in part, to a wider knowledge of the hospital among agencies, as well as to a more general understanding and acceptance of the purpose of the hospital by the patients themselves. But so far the patients sent by social organizations have been largely those whose difficulties or peculiarities have been so distinctly marked as to class them definitely as psychopaths,— a term which may be understood to include, in general, the epileptic, insane, feeble-minded and doubtful or border-line patients, and those persons with such other mental defectiveness as would result in their being distinguished as generally asocial.

If one should ask the organizations why these 679 patients were chosen to be given a mental examination, from many others who might have profited by it equally as well, one would find that there is no standardized system for making the decision. Some agencies dealing with the same type of individuals use the clinic and hospital freely, others but occasionally. Some, for example, feel that every unmarried mother should be carefully examined in order to procure a working basis for the plans for her future; others look only to the weeding out of the dependently feeble-minded, or the troublesomely insane mother. One thinks no plan for a dependent child should be made without first determining his mental status — and his intellectual characteristics; others, again, employ psychological examinations only to aid in securing custodial care for the feeble-minded children. This lack of standardization in the selection of patients to be examined is probably due not only to various opinions as to the importance or significance of such examinations, but to an unfamiliarity with the signs of beginning psychoses and border-line defects, on the part of the community, as well as social workers. But whatever the reason, it is true that the decision as to whether or not an individual shall be given such an examination, or even observation, rests much as did the question of investigation in the early days of organized charity,— upon the judgment of the unspecialized agent or authority in charge.

Social organizations now are in a transitional period with respect to their recognizing the importance of measuring, scientifically, the mental capacity of the persons for whom they

undertake treatment. They believe theoretically that the need of an individual, whatever its nature, cannot be met without an appreciation of his physical, moral, economic and mental condition. They employ trained workers to investigate the economic and moral situations. The physician is turned to frequently, though not as much as he should be, for advice as to the physical condition, but the average society relies upon the understanding and judgment of its workers for the recommendation that a person be given a mental or psychological examination. Such a standard for the use of mental tests meets the need of the individual and of the organization in a varying degree, dependent upon the experience with psychopathic individuals and knowledge of psychopathic diseases which the worker may have had. It also has the disadvantage of singling out certain persons as suspectedly defective, and the patient himself is apt to resent it.

There was a similar transitional period when Frederick Ozanam, the founder of the St. Vincent de Paul Society,[3] Thomas Chalmers,[4] Octavia Hill[5] and other pioneer workers in organized charity and reform movements, urged *investigation* as the only scientific basis for rendering charitable assistance of any kind. At first an investigation was made very guardedly and very superficially by the societies then in a position to make one. As time went on, certain cases were inquired into carefully as a matter of principle, but others were put aside as "too sensitive to be investigated," "evidently all right" or "because the society was too rushed at that particular time to go thoroughly into the inquiry"; and many well-meant corrections, kindnesses and alms went astray their mark because of it. It was years before social organizations of every kind took up the battle cry of "knowledge first;" and now no efficient agency or institution feels itself capable of giving advice, aid or supervision to any individual without first obtaining, through the services of a trained social worker, if possible, an intelligent understanding of that individual's social, moral, and economic history and, to a limited extent, his physical condition. Why should not one's mental history and mental caliber be of equal importance and be obtained in the same manner, that is, as *routine*? It is fundamental in every situation.

At one time in the history of the development of philanthropies, *routine* was a word which was to be avoided. That was in the early days of public charity, when meager relief was

doled out without respect to person. With the turning of interest toward the individual,— which first prompted investigation,— the public has been shown the dangers of blind routine, and has appreciated the general efficiency of intensive work with persons. Organizations have become *social*, as far as individuals and their relation to each other are concerned; but as Dr. Southard has so often said, the interpretation of *social* should not be confined to work with individuals or local communities. It stands for *society*, for *mankind*, and its meaning can be interpreted only through work with large numbers, unselected, and so dealt with that fundamental principles may be discovered. There are but few organizations which give time for the consideration of the particular conditions of their *clientèle en masse*. Those agencies which do are leading those which do not; they are promoting genuine reforms.

With respect to the immediate problems for which each organization is instituted, each recognizes its own function: the juvenile court to decide whether a child shall be sent to a correctional institution or to a training school for the feeble-minded and defective delinquent, or given indefinite custodial care; the Family Rehabilitation Agency, to decide whether parents are morally and intellectually capable enough to warrant keeping the family together, supplementing its income and supervising its development. The Child-caring Agency must know which children shall be offered for adoption and which ones for merely temporary care, which ones with special training in early years may be made self-supporting and self-protecting, and which must always be supervised. Church representatives must decide which parishioner will be wisely helped quietly, and which will be injured by aiding him without first consulting those who have known him the longest. The social service worker in the store must know whether or not she shall intercede on the part of an employee for another trial, and should be ready to say whether the employee is passing through a period of a day or a month when he is physically and mentally irresponsible,— at which time he is probably called lazy, eccentric and impertinent by his coworkers,— or whether he is actually taking advantage of his employer. The inevitable homes for dependent women, with their large number of cases of illegitimacy and drunkenness, must decide the best method of collecting accurate data, which will be of value in the general study of illegitimacy and intemperance.

An organization usually realizes its own limitations in its case work, and when the conditions of a problem show that the limitations have apparently been reached, the organization is turning more frequently to the mental specialist for advice. But why not establish the mental status of the individual first, and plan accordingly from the beginning? Why wait until all plans have failed and the workers are thoroughly discouraged? Every exaggerated instance of mental defect or disorder is comparatively easy to detect, but it is the apparently normal person, ill-fitted to his surroundings and misunderstood, who suffers most by unscientific treatment. The following stories illustrate some of these misunderstood types which come to us:

A young woman, thirty-seven years of age, socially diagnosed as "a neurasthenic, who thinks the churches and social agencies owe her a living" (the diagnosis of neurasthenia having been made by an unspecialized physician, who had been consulted), was dropped by all who had helped her for some time, and given the advice that she was able to work and should take care of herself. She had a disfiguring acne eruption on her face, and explained it to the hospital as due to a slow poison which her friends and relatives had been putting in her food for a number of years past. She had been restless in her work, frequently changed her positions, and as time went on became so paranoid that in the early spring her acquaintances persuaded her to go to the Psychopathic Hospital. After three weeks' observation, during which time a careful history of her early life and habits was obtained, the diagnosis of dementia præcox was made. On her discharge from the hospital the nature of her illness was explained to a former employer, who agreed to give her work again. Her acne was treated at another hospital, and finally cleared up entirely. A change in lodging was made, good meals and exercise were planned for her, and very soon her life was proceeding without friction. Her work was so good that she was one of five women kept steadily employed during the dull summer season. She had established herself without financial aid from any one, and by the end of the summer she had paid her debts from her own savings. In case she should have a return of the former symptoms, which unfitted her for work,* she will be returned to the Psychopathic Hospital for another

* It is believed by some that in cases of dementia præcox the patient frequently goes through a period of many months — even years — before the attacks of dementia are repeated. (See Kraepelin.*)

period, while her place will probably be held for her by her employer, who understands the situation.

A girl of ten, in a reform school, was a difficult one to place in any department of the institution. She was never malicious, was attractive and very likable, and in some respects did well in school, but she quarreled with the girls in one division and complained so much of the officer in charge that she was transferred to another. Her work was slack. In the kitchen she couldn't "get along with the cook," and in the laundry it was the supervisor. In the schoolroom her excuse was the same. She "couldn't get along with the people" she lived with. Finally she was put in the farm cottage, but even there, though other troublesome girls had shown improvement, she showed none. At length she was given the much-sought task of "tending the cows." When the cows did not return at the usual time an officer went in search, and down by the fence in the pasture sat the child in tears, sobbing that she "just couldn't get along with those cows." An examination later showed mental defect, and the child was transferred to a school for the feeble-minded.

A "complaining, lazy" father of a family of six children had been the loadstone of agencies and employers for seven or eight years. After much time and money spent in finding new employment for him and furnishing the means of livelihood for his family, he was brought under observation at the Psychopathic Hospital and diagnosed as a general paretic. He was committed to an institution for the insane, and plans made for the family by the agency in charge. The long-disputed question as to whether the father was able to work, or should be made to contribute toward the support of his family, was removed.

Miss N., a plaintive little woman of twenty-seven years, with an illegitimate child, had been helped by all the child-caring agencies and other agencies interested in the problem of the unmarried mother, but she gave endless trouble. She was either complaining of the persons who were boarding her baby, or, if keeping her child with her, Miss N—— found it impossible to care for the child and do the work required. For several years frequent changes had been made by the obliging workers, who tried to please her. Upon investigation the history and references which she gave proved fictitious, and it was frequently found that she was untruthful about other things. Finally all these agencies "closed her case" and had no more time to give to her. It was at this point that the Miss N—— came one day to a new

agency. From the confidential exchange report it was evident that she should be returned to one of the societies formerly interested in her, but as each in turn refused to assume any further responsibility for her, the new agency undertook the work, and attacked the problem from another point of view. The applicant was undoubtedly worn out physically. A rest was promised her upon her consent to have a physical examination. She was sent to the Psychopathic Hospital. The report from there showed an active process of gonorrhea, a generally weak physical condition, and a mental classification of moron. Her baby also had a gonorrheal infection. Both were sent to the State Infirmary for treatment, where the mother stayed for three months.

In each of the foregoing situations the advice of a mental specialist and of a psychologist was needed to determine the real nature of the problem, which to the lay worker had appeared to be entirely social.

If a system were in use for uniformly securing mental and physical examinations, including the Wassermann test, many of the difficulties which agencies now face would be obviated. The lay worker has questioned the value of the use of mental tests, but psychologists and physicians claim that they yield important results, if used carefully by specialists. Various methods of examining have been proposed.[7] The Binet-Simon scale[8] and the Healy[9] tests have, perhaps, been most generally in use. With patients whose defect proved decidedly marked the examinations by these two methods were helpful to the agencies employing them, but for the patients classified as doubtful or border-line, the "all or none" method of the Binet scale did not truly represent their ability.

The Yerkes-Bridges point[10] scale, which has been devised at the Boston Psychopathic Hospital, has there supplanted the Binet scale. To quote from a recent publication regarding it: —

> The point scale has been constituted with a view to simplicity and uniformity of use for measuring a variety of the aspects of mental capacity. The scale consists of a single series of tests, all of which are supposed to be applied to the individual under examination. For each test credit is given according to the merit of the subject's response, and the name, point scale, is fitting because the subject achieves a varying number of points of credit according to his mental ability. The method provides for the comparability of the measurements made on individuals differing in age, since a large number of the mental functions which are considered exist in varying

degrees in all the individuals examined. Finally, the point scale contains in itself the provision for improvement and for increase in the value of its results, since the series of tests may at any time be thoroughly revised in the light of the results obtained, and since the calculating of norms will inevitably increase the possibilities of interpreting results and of exhibiting any given individual in his relations to any group or collection of groups in which he belongs, and in comparison with whose mental status he should be considered and treated.

The present point scale is to be regarded as a preliminary to the development of a universally applicable scale.

For measuring the mental capacity of illiterate foreigners, special tests have been standardized by Dr. Howard Knox[11] of the United States Public Health Service, New York. Acting Assistant Surgeon Shier[12] of the United States Navy has devised a system which is said to be especially adapted for the examination of applicants at the recruiting stations. Because of the many forms of mental tests and the accompanying claims and criticisms as to their respective values, there has grown up a distrust of their having any practical use other than that of detecting the markedly feeble-minded. If that were their only virtue, they would still be of distinct service to many institutions.

Passed Assistant Surgeon Sheehan of the United States Navy says:[13]

Methods of testing intelligence have been in use in psychological laboratories for many years, but it is only of late that they have been applied to the practical problems presented in pedagogy and psychiatry. As a result of their widespread use in these fields, it soon became apparent that they might be utilized to advantage by the military service as a means of excluding defectives. Considerable work has been done in the endeavor to adapt them to this purpose.

Due to the fact that these tests have been acclaimed by the popular press, and even by technical writers as an exact means of judging the mental and moral mechanisms of any normal or abnormal person, they have come into wide use, and often by persons having little or no scientific knowledge. Therefore, their true value has been lost sight of through uncritical exploitation and mystification.

But, aside from detecting the feeble-minded persons, these psychological examinations also record the success or failure of an individual's performance of certain tests. When given carefully and under conditions which place the individual at ease, these results should be a fair representation of his ability to do

these tests, and the data should form a basis for valuable comparison with the results of future examinations. If such an institution as the United States Navy Recruiting Station can find the use of psychological tests, given under favorable contions, useful, surely organizations dealing with the dependent, delinquent and distinctly asocial individuals, should find the use of them equally valuable.

By securing the psychological and medical diagnoses of social patients, social organizations, as well as other organizations, would not lose sight of the needs of the individuals. The diagnoses should be but a step toward more intensive work for them, and should indicate to the agent the tendencies in the patients to be guarded or repressed and those to be strengthened or supplemented.

If such examinations were required as routine by every agency undertaking to supervise for any length of time the life of a child or an adult, the applicant who now considers the suggestion of such examination an implication that he is insane or feeble-minded, would come to look upon the process as he would upon the test of scholarship or ability,— as an effort to rank him with thousands of other people,— or an attempt to obtain a register which would point out to him, as well as to his supervisors, his weaknesses and his strong points.

The applicant would come to welcome the technic which enables the clinic to detect in his younger children the early stage of the disease which caused his oldest child to waste away as a juvenile paretic. He would appreciate the explanation that one child should be watched and trained with more care than the others, in order to give him a chance to cope equally well with the vicissitudes of life; or even the advice that a third child needed institutional training or custodial care, or that he himself should have treatment for syphilis as a safeguard against general paralysis or total blindness in middle life.

But, aside from the applicant's appreciation of the system, the directors of social welfare propagandas and social agents would be alive to new situations, and would find themselves looking for new ways to handle old problems. The high-grade feeble-minded girl would be detected before she were old enough to face for herself the danger of becoming an unmarried mother.

The son who shows signs of early deterioration which mark the progress of the mental disease known as dementia præcox, would be noted and chronicled, so that, if examined from period

to period, his rate and amount of deterioration would be ascertained. Or, as the study of this disease by scientists and doctors results in an understanding of its causes, and in methods of checking its progress, the young man might, at a fairly early stage, be saved the later course of the development of the disease. This class of mentally disabled, alone, presents tremendous difficulties to any social organization and demands consideration of new ways to be worked with and cared for.

The defective delinquents, not intellectually backward, but morally incapable of keeping themselves out of trouble, or too weak in will power to be made responsible for their own deeds, would be found and classed together as a group to be studied and to be cared for by non-penal public institutions,—institutions which should be adapted to take advantage of the economic value of these delinquents.

The problem of syphilis in the community and its relation to mental disorders would be faced more frankly by medical and social agencies. Some persons do not agree with the policy of the Psychopathic Hospital in requiring the routine Wassermann test, but the importance of the problem and its relation to mental disease demands it. Dr. Southard has said on this subject: —

> We have . . . an important mission with respect to syphilis. When the patients admitted to a State institution for the insane show positive Wassermann reactions in 22 per cent (H. L. Paine's data, Danvers State Hospital) or, as at times for certain months at the Psychopathic Hospital, from 25 to 38 per cent, it is high time that social workers and economists, as well as physicians, should begin to take an interest in that field of mental hygiene which shall seek co-operation with the sex hygiene propagandists.[14]

That the treatment and study of syphilis is legitimately a State issue is being more and more generally conceded. The appropriation of $4,000 by the Massachusetts State Legislature (April, 1914) to be spent for Wassermann tests by the State Board of Health, is but an indication of the fact that the disease is here recognized as a public menace, to be dealt with by public measure. More data showing the relation between syphilis and mental disorders, would be of great value in a propaganda for the State control of the study, treatment and prevention of the disease.[15]

Routine mental and psychological examinations would, therefore, throw into the limelight of social welfare work the problems of the feeble-minded, the early dementia præcox type, the

defective, delinquent, sufferers from latent syphilis, and the other so-called asocial groups, each so largely represented in mental disorders, and requiring unlimited thought, care, trouble and expense on the part of private and public organizations and institutions. After all, it is the community which bears the brunt of the now unscientific method of dealing with these problems. The income from high rates of taxation now contributes far more to the care of the diseased, delinquent and defective members of the community than to the prevention of the causes of these unfortunates.

A systematic investigation of the mental condition of the chronic dependent, the delinquent, and the asocial members of the community would lead from the more general campaign for social welfare to a broader and yet more definite campaign for mental welfare. It should in time save money to the taxpayer.

PART II.

A Survey of Certain Social Organizations in Boston showing the Results of their Use of Mental Tests.

To what extent the intensive study of the mental development of an individual should or could be carried by an organization is a much discussed question, and one which calls forth decided differences of opinion.

It was with a desire to gather these opinions, and to determine as far as possible the extent to which organizations working with social problems were already interested in and active with the question, that the following study was undertaken. It was made from the reports of 27 social organizations of Boston and vicinity, and showed some interesting facts relative to the theme of this paper.

In order to secure the necessary data, a questionnaire was sent to seventy-five organizations, chosen at random. The questionnaire covered the work of one fiscal year previous to the summer of 1914. The organizations included social service departments of business houses, private and public child-caring agencies, family rehabilitation and relief agencies, homes for dependent women, settlements and churches, school visitors and nurses. Twenty-seven of these responded. Although this number is small, the 30,410 cases* enrolled by these organizations, and from which this study was made, should make the figures fairly representative.

* In the seven agencies which dealt largely with family groups the family is counted as a single case.

Those who did not respond to the questionnaire gave various reasons for their inability to do so. The business houses, as a rule, kept no physical or social records of their employees. This was also true of some churches and their parishioners. A few agencies had not given sufficient thought to their mental problems to note them on their records. Others, who kept careful histories of their cases and dealt with large numbers, were not able to pick out the ones representing psychopathic problems, because their system of recording did not make the year's work readily accessible. Still others had not the time to devote to a special study of this type because it required, in their particular instances, a handling of every record worked on during the year. Some few questioned the value of such a study in proportion to the time and effort demanded of them to secure the necessary data. Many in the groups mentioned also objected strongly to the giving of names, although each organization was assured that the names were wanted only to prevent duplication, and would be destroyed as soon as the reports had been checked with each other.

Several of the 27 agencies which did respond had difficulty in collecting data, and expressed a regret that they had not kept more accurate and more accessible references to their psychopathic problems.

In the spring of 1914 the following form was sent to each of the 75 organizations. The immediate object of the questionnaire was first to ascertain as far as possible the number of mental cases in each agency, and their proportion to the total number of individuals dealt with by each group; and secondly, to obtain an estimate of the extent to which each agency felt it should have gone in having others under its care examined: —

QUESTIONNAIRE.

1. What was the total number of individuals dealt with during your past fiscal year?
2. How many were diagnosed epileptic? (Give names.*)
3. How many were diagnosed insane? (Give names.)
4. How many were diagnosed feeble-minded? (Give names.)
5. How many were examined and diagnoses given of "border-line or doubtful"?
6. Give estimated number of individuals for whom you felt an early examination would have been advisable, but was not given.

* Names were asked for in order to eliminate duplication, but there was very little overlapping found.

The following organizations reported: —

1. Boston Associated Charities.
2. Boston Children's Aid Society.
3. Boston Children's Friend Society.
4. Boston Children's Institutions Department.
5. Boston Juvenile Court.
6. Boston Provident Association.
7. Brookline Friendly Society.
8. Cambridge Associated Charities.
9. Catholic Charitable Bureau.*
10. Church Home.
11. Filene & Co., social service.
12. Florence Crittenton Home.
13. Federated Jewish Charities.
14. House of Mercy.
15. Jamaica Plain Friendly Society.*
16. Llewsac Lodge.
17. Paine Fund.
18 and 19. Public School Studies (two).
20. Salvation Army Rescue Home.
21. Society for the Care of Destitute Mothers and Infants.
22. Somerville Associated Charities.
23. South End House.
24. State Infirmary, social service.
25. State Minor Wards.
26. Temporary Home, Shawmut Avenue.
27. Waltham Watch Factory, social service.*

That the organizations reporting on the questionnaire represented work of varying extent was indicated by two classifications, one showing the total number of individuals dealt with by each organization during the year, the other showing the type of work done.

Classified according to the numbers which each agency worked with, there were —

2 organizations dealing with less than 100 cases.
8 organizations dealing with from 100 to 250 cases.
5 organizations dealing with from 250 to 500 cases.
4 organizations dealing with from 500 to 1,000 cases.
7 organizations dealing with from 1,000 to 5,000 cases.
1 organization dealing with 6,072 cases.

* Did not give names.

Nine of these organizations dealt chiefly with family groups, and from seven of them it was not possible to secure the total number of individuals included in the work done. As the reports showed only thirteen defective individuals in families already represented once, these thirteen were thrown out and the percentage of psychopathic individuals for each agency was made upon the basis of the number of cases.

The totals, therefore, showed 984 cases in which at least one individual was insane, epileptic, feeble-minded or border-line. Seventeen per cent of these 984 persons were diagnosed insane, 10 per cent were epileptic, 53 per cent were feeble-minded and 20 per cent were doubtful or border-line.

In the second classification of agencies there were —

	Total.
Family rehabilitation and relief agencies (private),	9
Child-caring agencies (public, 3; private, 4),	7
Homes for dependent women (public, 1; private, 5),	6
Neighborhood house,	1
Public school studies made by special students,	2
Social service in business houses,	2

From the reports of these agencies two percentages were made. The first showed the percentage of diagnosed epileptic, insane, feeble-minded and border-line cases (questions 2, 3, 4, 5) in the total number of cases dealt with; the second showed the percentage of such cases in the total number when, to the cases diagnosed, were added the estimate of those persons who, it was thought, should have been examined, but were not (question 6). The second table has no value statistically, except to indicate to a certain extent the feeling on the part of the agents in regard to the importance or value of the use of mental and psychological tests for the asocial persons or those not obviously considered in need of an examination. No effort has been made to use these figures except to report them in the following table, as given.

Judging from the fact that most of the figures were obtained by going rapidly over the records of the year's work, it is highly probable that none of the returns are as full as they would have been had a systematic list of the epileptic, insane, feeble-minded, border-line or doubtful cases been kept by each organization from day to day.

Arranged according to the increasing order of the first percentage made, the organizations gave the following figures.

Where no change was made in the estimated number of mental cases, the agencies felt they had secured the examination for all persons who had needed it.

	First Per Cent Diagnosed.	Second Per Cent Estimated.
Waltham Watch Factory, social service,	.1	.1
Filene & Co., social service,	.2	.2
Public School Study,	.7	4.7
Catholic Charitable Bureau,	1.3	1.0
Somerville Associated Charities,	1.1	1.5
Llewsac Lodge,	1.4	2.3
Public School, social service,	1.5	9.5
Children's Institutions Department,	1.6	1.6
Boston Provident Association,	2.0	No estimate.
South End House,	2.0	7.3
Florence Crittenton Home,	2.2	10.0
Boston Juvenile Court,	2.3	2.3+
Salvation Army Rescue Home,	2.5	2.5
Temporary Home, Shawmut Ave.,	2.7	8.5
Boston Children's Friend Society,	2.9	2.9
Cambridge Associated Charities,	3.0	No estimate.
Federated Jewish Charities,	3.1	7.7
Children's Aid Society,	3.4	3.8
Boston Associated Charities,	3.8	No estimate.
Brookline Friendly Society,	4.2	25.9
State Minor Wards,	5.9	6.1
Society for the Care of Destitute Mothers and Infants,	7.0	16.3
Jamaica Plain Friendly Society,	7.3	7.3+
Church Home,	12.7	Routine.
Paine Fund,	13.5	18.5
House of Mercy,	17.9	Routine.
State Infirmary, social service,	23.0	Routine.

Considering the types of individuals under the care of these organizations, the foregoing figures seem to fall into four groups.

The first group brings together the employees of one factory and of one general department store, a portion of the population of one neighborhood house district and persons represented by studies from public schools in two economically poor sections of the city. Altogether, they may be considered a cross section of a community with which social agencies of all kinds are concerned. (See Table I.) The total percentage of psychopathic individuals reported in this group is .3 per cent of the given population.

TABLE I. *Twenty-seven Social Organizations.*

Cross Section of Community.

	Mental Cases (Per Cent.).
Waltham Watch Factory,	.1
Filene & Co.,	.2
Public School Study,	.7
Public School Study,	1.5
South End House,	2.0
Total mental cases,	.3

Family Rehabilitation.

	Mental Cases (Per Cent.).
Somerville Associated Charities,	1.1
Llewsac Lodge,	1.4
Provident Association,	2.0
Federated Jewish Charities,	3.1
Cambridge Associated Charities,	3.0
Boston Associated Charities,	3.8
Brookline Friendly,	4.2
Jamaica Plain Friendly,	7.3
Paine Fund,	13.5
Total mental cases,	3.0

Child-caring Agencies.

	Mental Cases (Per Cent.).
Catholic Charitable Bureau,	1.3
Children's Institutions Department,	1.6
Juvenile Court,	2.3
Children's Friend,	2.9
Children's Aid Society,	3.4
State Minor Wards,	5.9
Church Home,	12.7
Total mental cases,	4.5

Temporary Homes for Women.

	Mental Cases (Per Cent.).
Florence Crittenton,	2.2
Salvation Army,	2.5
Temporary Home,	2.7
Destitute Mothers and Infants,	7.0
House of Mercy,	17.9
State Infirmary, social service,	23.0
Total mental cases,	7.9

This population represents a community made up of people who are working for generally small wages. On the whole, they are considered normal, most of the distinctly abnormal individuals having been placed in institutions. And yet when we compare this .3 per cent with the .5 per cent which represents the total number of insane, epileptic and feeble-minded persons receiving institutional care in the total population for the State of Massachusetts, there is an astonishing similarity in point of average.

There are two possible explanations for this: first, the actual percentage of the mental cases receiving custodial care is probably far below what it should be. Dr. Fernald's report of the results of an intensive study of the feeble-minded in Massachusetts, which was made following the 1912 census of the State Board of Insanity, states that there are in the community at least five times as many feeble-minded persons needing custodial care as there are those now receiving it. There is also undoubtedly a large proportion of insane and epileptic persons in the community who ought to be given custodial care. As there has been no intensive study made of either the insane or the epileptic in this State, it is impossible to make any estimate which would correspond with Dr. Fernald's study of the feeble-minded.

The second comment is that the community cross section used in this study represents an economically low group of persons. Among them one finds many of the border-line boys and girls, and men and women who are not committable to institutions and are capable of earning the lower wages. In the two public school districts and the neighborhood house district the families represent the struggling masses. We know that the industrial and professional life of our country is supported to a great extent by men and women coming from the lower economic classes of society, but it is also true that in this stratum there is a large proportion of persons who never rise above it.

Where one finds in this class no improvement from generation to generation, one is apt to find a low grade of mentality as well as physical, mental and moral disease in varying degrees. It might, therefore, be expected that here one would find a large number of the insane, epileptic and feeble-minded. It is in this economic stratum that most of the cases known to the other twenty-two social agencies are found.[16] It seems fair, therefore, to compare the percentages of the three following groups with this chosen cross section of the community.

The first group for comparison is made up of agencies caring chiefly for families and undertaking family rehabilitation. It shows that 3 per cent of the persons known to them have been diagnosed as psychopathic. The second group is made of agencies caring for dependent and delinquent children and has 4.5 per cent of mental cases. The third group includes the temporary homes for women and agencies dealing with unmarried mothers. Here there is a distinct rise found in their 7.9 per cent of mental cases. (See Chart I.)

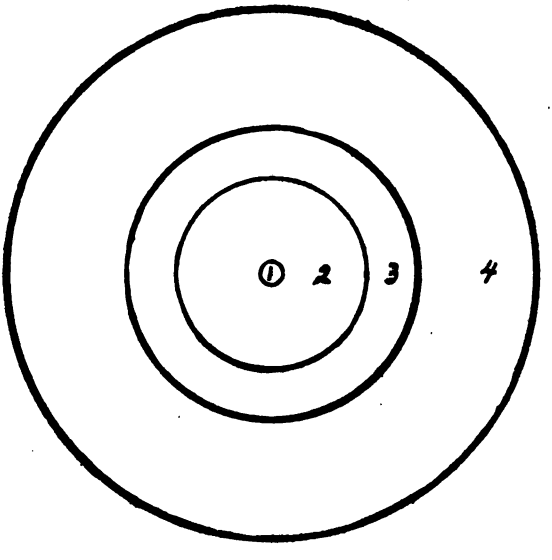


CHART I. — Mental cases in twenty-seven social agencies. Comparison of the total percentages of mental patients in four groups of cases. (Centre=.3 per cent cross-section of community; second circle=3 per cent family rehabilitation agencies; third circle=4.5 per cent child-caring agencies; fourth circle=7.9 per cent temporary homes for women.)

Returning to the detail of the last three groups, it will be seen that in the family rehabilitation and relief agencies the percentages range as follows: —

	Psychopathic (Per Cent.).
Somerville Associated Charities,	1.1
Bedford Home for Women,	1.4
Provident Association,	2.0
Federated Jewish Charities,	3.1
Cambridge Associated Charities,	3.0
Boston Associated Charities,	3.8
Brookline Friendly,	4.2
Jamaica Plain Friendly,	7.3
Paine fund,	13.5

The sharp increase found in the 13.5 per cent of the Paine fund may be accounted for in part by the fact that a large percentage of the individuals aided by that fund are those who have passed middle age without having been able to provide the means of livelihood for the later years of their life. There are many aged persons who are dependent through no fault of their own, but they are entirely outside of the group of those whose histories show indigence and delinquencies. The Paine fund cares largely for dependent single persons, and for married ones who are without relatives to help them. The secretary of the society has but a comparatively small number of applicants during the year, so that it is possible for her to work in close co-operation with the medical agencies and give her applicants very personal attention.

As a whole, the family group of organizations has a surprisingly low percentage of insane, epileptic and feeble-minded.

One is inclined to feel that families which must be aided and supervised from year to year, and are unable to rise above the need of it within the course of two or three years — as a portion of them are not — must be, to a great extent, handicapped by a subnormal or diseased mind. It would be worth while with this group of family rehabilitation agencies to make an intensive study of the 343 families in which this report finds diagnosed 343 psychopathic individuals. It is significant to note just here that from all of the figures sent in for this study, there were only 13 other mental patients reported as belonging to these 343 families. This would indicate that either the data were incorrectly recorded, or that other members of families in which there are mental patients are not being recognized.

An intensive study of these 343 families should ascertain the number of years each has been under the care of a social agency, the kind and amount of aid given, and the results secured in proportion to the time and money spent after a stated number of years. It should also determine the number of other members in the family showing signs of disease or defect. This information is evidently important in studying the group of psychopathic persons already recognized. Is it not also important to look into the mental condition of the members of those other families which drift along from year to year, apparently content with gaining mere sustenance, getting out of difficulties, and ending their days supported by some fund or by a private or State institution?

Both State and private institutions would contribute toward the improvement of the community at large, as well as to the efficiency of their own work, if it were possible at an early stage in the history of these families, to obtain their mental status.

It is not at all surprising that the total number of mental cases in this family rehabilitation group is 3 per cent of the whole, as compared with the .3 per cent mental cases of the cross section, representing the community in which most of them are found. On the other hand, if for one year these family rehabilitation agencies were to catalogue or signal every individual with mental disease or defect known to them during that time, and if they were to make a greater effort to have examined more of their eccentric applicants and those offering particularly difficult problems, it is quite probable that the total number of mental cases would increase in percentage. The present figures are of value only as a basis for comparison in a further study.

The child-caring group as here given includes the organizations responsible for delinquent children, as well as those caring for dependent children. This at first seemed to be a doubtfully fair grouping, but inquiry brought out the fact that most of the agencies caring for dependent children were attempting close co-operation with the juvenile court, and were boarding out and supervising many children for whom the court had advised a change of environment. Some children in the care of these agencies had also acquired court records, so that they were already classified among the delinquent. The problems, therefore, of the agencies dealing with the dependent and the delinquent children seemed closely enough related to warrant their being classified together in this study. Seven agencies reported their mental cases as follows (all duplicate names have been eliminated): —

	Mental Cases (Per Cent.).
Catholic Charitable Bureau,	1.
Children's Institutions Department,	1.6
Boston Juvenile Court,	2.3
Children's Friend Society,	2.9
Children's Aid Society,	3.4
State Minor Wards,	5.9
Church Home,	12.7

The total percentage of mental cases for this group is 4.5. Five of these agencies already attempt to have physical exam-

inations for their children before any responsibility is assumed, but they are not given as routine. The State Minor Wards has its own physician, and has every child examined before accepted for its care. They had under supervision during the year reported on 6,072 children, 361 of whom were feeble-minded, epileptic, insane or border-line. The State felt the need for the physical examination of these children, and the means for providing it was found. The psychological examination will be more uniformly used, and equipment for it will be provided, as agencies like the State Minor Wards feel the need for psychological as well as physical examinations.

In the work for children there are two reasons for establishing the mental status of each child. First, to detect the feeble-minded and subnormal; the value of this is obvious. The second is to be able to record a definite mental rating for the normal child in order that future mental tests, over periods of perhaps five years, may show whether the patient is developing normally, or is deteriorating. Most of the dependent children have a poor heredity, and even though unusually bright in childhood, may, during adolescence, show arrested development or a beginning psychosis.

In order to make a diagnosis of a beginning psychosis in a child it is important to know whether or not he has deteriorated, and if so, at what age the deterioration appeared, and along what lines. With the inevitable frequent changing of supervising agents, this information cannot be obtained accurately from social records. The routine use of standardized psychological tests offers the only scientific method for acquiring this part of the history of a child.

The 4.5 per cent representing the total percentage of mental cases reported by these child-caring agencies shows an increase over the three per cent mental cases reported by the family rehabilitation agencies. This does not at all signify that there is a larger amount of mental disease and defect found in groups of children than in the social groups, including children and adults. It is rather more probable that the child-caring agencies have been able to secure an examination for a larger proportion of their cases than the family rehabilitation agencies have secured. It is quite natural that this should be so, since the children's agencies have far greater control over the children under their care than any of the family rehabilitation or relief agencies have over their applicants. In comparison with the

.3 per cent mental cases in the community cross section, it is, however, important to note that so large a percentage as 4.5 defective and mentally diseased children should be found among these special children's agencies.

An analysis of the percentages of the seven agencies calls forth further comment. The first six percentages range from 1 to 5.9 per cent mental cases, while their total percentage is 2.8. On the other hand, the Church Home, which is the seventh agency in the group, stands by itself with 12.7 per cent mental cases, in spite of its endeavor to raise its standard for the type of child taken under its care. It is probably significant that during five months of the year reported on, the Church Home secured a mental and physical examination for every new child accepted for care of any kind. This would seem to indicate that we are not in a position to estimate the number of defective and insane children without a more extensive use of psychological and physical examinations.

The last group of agencies, and perhaps the one most urgently in need of a systematically intensive study of mental conditions, includes those agencies helping stranded women of various types. Conspicuous among these women are the many unmarried mothers. Some of the child-caring agencies are making an effort to supervise, outside of institutions, certain of these mothers, but the temporary homes still are necessary for some purposes. Unfortunately, we have not been able to secure figures from those child-caring agencies which have recently undertaken the boarding-out phase of this work. The following reports are from temporary homes (with one exception). Arranged according to the percentage of women diagnosed psychopathic, the reports show: —

	Mental Cases (Per Cent.).
Florence Crittenton Home,	2.2
Salvation Army Rescue Home,	2.5
Temporary Home for Working Women,	2.7
Destitute Mothers and Infants,	7.0
House of Mercy,	17.9
State Infirmary, social service,	23.0

The total per cent is 7.9, but a closer analysis is important. The first three institutions have a striking similarity in the number of mental cases they have detected, the number being indicated by 2.5 per cent of the total number of persons worked

with. In each of these homes the supervisor is interested in the girls under her care, and is anxious to secure an examination for those who are not thought to be normal. On the other hand, the Society for Helping Destitute Mothers and Infants, which places many unmarried mothers at work and in boarding homes, and bases its treatment upon investigation and observation, shows an increase of over 4 per cent of psychopathic women.

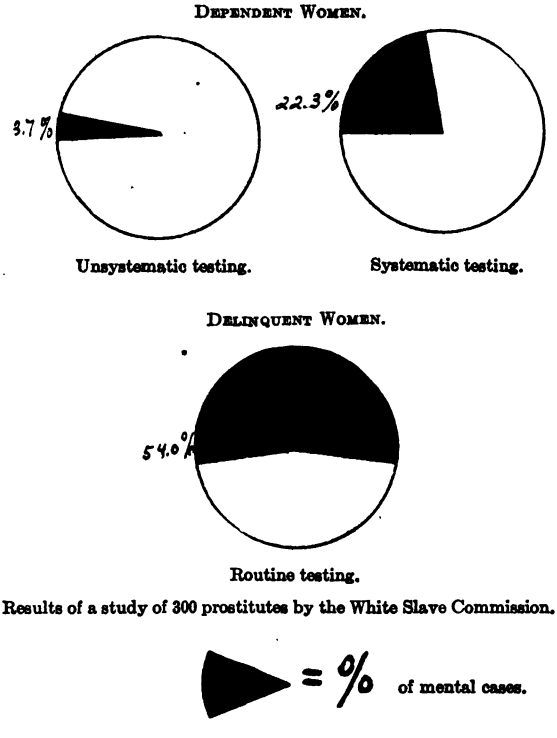


Chart II.—Mental cases found in agencies dealing with illegitimacy. (Classified according to the extent to which mental tests were used.)

It is hardly possible that this agency has under its care a lower type of woman than that which usually seeks shelter in an institution. But a still more striking rise in percentage is found in the average of the two institutions dealing almost entirely with unmarried mothers, namely, the House of Mercy and the State Infirmary (social service), both of which have endeavored to make a systematic study of the mental condition of those

in their care, no matter what the circumstances of the mother's life may have been. The 22.3 per cent average of these two institutions would indicate surprising returns from the systematic use of mental tests.

The foregoing are the figures shown for the unmarried mothers, who are, for various reasons, dependent but not unnecessarily delinquent, to any great extent. It is, however, interesting at this point, to note from the Massachusetts Commission for the Investigation of the White Slave Traffic in 1914, that in a series of 100 women prostitutes chosen from prisons, another 100 from detention homes, and a third from industrial schools, 51 per cent of them were found to be feeble-minded and 3 per cent were insane, making a total of 54 per cent psychopathic. (See Chart II.)

That there should be 7.9 per cent total mental cases found in these temporary homes for women is not at all surprising; rather, one might expect to find a much higher percentage of the defective or mentally diseased in a group in which the unmarried mother forms so large a part. One does not condemn all unfortunate women as necessarily insane or feeble-minded, but figures are pointing out more and more clearly that mothers with illegitimate children who become dependent or are brought before the courts, include enough feeble-minded and insane among them to make further systematic inquiry important.

In conjunction with the study of these four groups, it is interesting to analyze the figures in such a way as will show comparative relations depending upon the different technic employed by the four groups of agencies.

With respect to their manner of selecting patients for examination, these twenty-seven organizations fall into three classes, namely: (1) those who have persons examined only when the disease is obvious; (2) those who base the need for an examination upon a suggestive history, including heredity, conduct and general physical symptoms, in part or all together; and (3) those who believe in a routine mental examination for every individual under their care, but for various reasons have been able to secure it for but a given portion. This last class of agencies, may be designated as those who have systematically used the mental tests.

There were thirteen of these agencies who made use of special examinations only when the defect was obvious. (See Chart III.) Their total per cent of psychopathic cases was 1.3 per

cent. There were eleven agencies who based their use of special examination upon any history of their charges which suggested the need for examination, and their total mental cases amounted to 4.3 per cent of their whole number dealt with. There were just three agencies attempting to make a systematic inquiry into the mental status of their charges, and the result of this effort showed 19.2 per cent of their charges to be psychopathic. Two of these three agencies dealt with unmarried mothers, and one cared for dependent children.

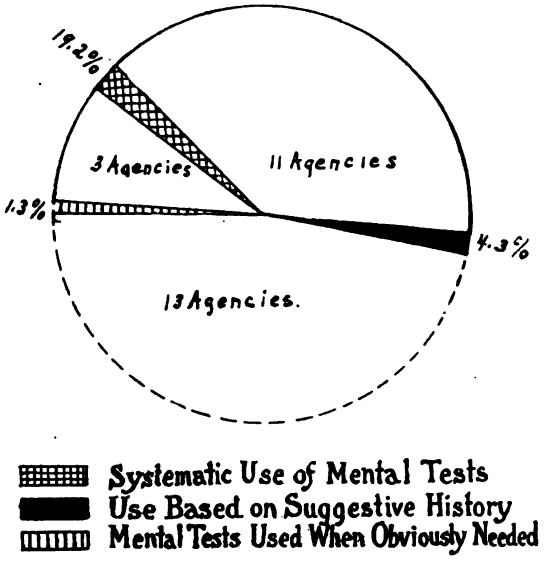


CHART III. — A study in technic. Three groups in the study of twenty-seven social agencies. The extent of their use of mental tests and the respective results as represented by the percentage of mental cases found in each group.

Applying this same method of classification to the temporary home group, which is characterized so largely by its problem of illegitimacy, and comparing the total percentages of its three classes with those of the same three classes for the whole twenty-seven agencies as given above, we have what appears to be a closely corresponding increase in percentages, depending upon the method of selecting patients for examination. (See Chart IV.) In the temporary home group, examining for obvious defect, the percentage of mental cases is 2.5 per cent as compared with the 1.3 per cent for this class in the whole group.

The temporary home group has 7 per cent mental cases in the agency basing its use of special examinations upon the suggestive history of the patient, as compared with 4.3 per cent mental cases for the whole group of agencies. Again, the temporary home has 22.3 per cent mental cases in the agencies making a

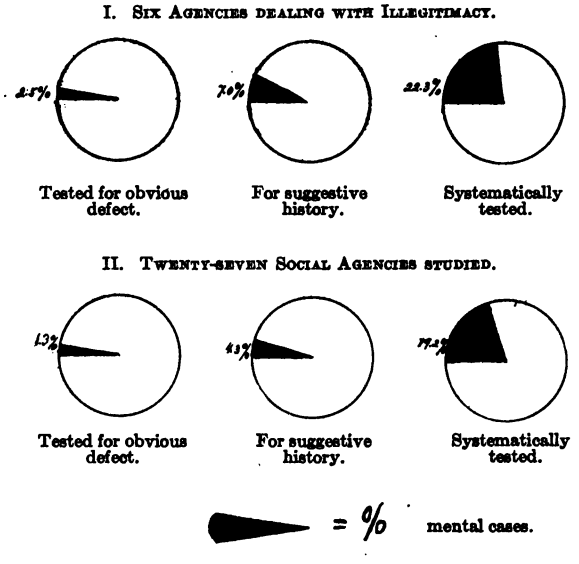


Chart IV.— A comparison of I and II, based on the use of mental tests.

systematic use of the mental tests as compared with 19.2 per cent mental cases in the corresponding class for all the agencies. Just how significant this analogy is can be determined only by a further study of these agencies and the results of their uses of mental tests.

PART III.

Concerning the Use of Routine Psychological Examinations for Certain Agencies.

We have not yet come to the era when all persons shall be ranked by society upon an efficiency basis,— when the stagnant men and women, the non-producers, whether rich or poor, shall be looked upon as one and the same, socially as well as economically, or when the ability of men and women shall be gauged by methods which will approach a uniform standard. The day may

come, but until that time the public is particularly concerned with the mental status of those members of the community who, because of mental, moral or physical weakness, or because they are unable financially to care for themselves, are costing the State and private organizations large sums of money and much thought and work.

For the public and private agencies dealing with dependency, delinquency, child-caring and illegitimacy problems, the use of a routine mental and psychological examination, combined with the physical examination and Wassermann test for syphilis, seems to be the most direct means of finding the primary causes of their problems.

Directors, physicians and psychologists in psychopathic hospitals and psychological clinics are persistently considering and testing practical and fair methods for rating the mental status of the patient. It is their endeavor to make the application of the tests advantageous to the work of the various organizations employing the clinic, quite as much as that they should have the results of the tests as a basis for study and improvement.

In order to get the opinion of the representatives of social agencies in regard to the possible benefit to be derived from a routine use of mental tests, a second letter was sent to each of the twenty-seven agencies which responded to the first questionnaire. Opinions were expressed in favor of and against such a system. A few of their replies are quoted in part.

Some of the child-caring agencies wrote as follows: —

Children in our care are under such close supervision that when the need for mental examination exists the visitor is prompt to discover it, and the examination may then take place.

Another wrote: —

Such an examination would give rise to serious objection on the part of the public at large, especially the parents and guardians of the children.

Still another said: —

For patients who have indicated no mental instability in their past lives, the examination produces a state of mind which very much affects the social treatment. This applies to children, as well as to unmarried mothers.

One agency, which has been urging a central medical examining agency to which all might send their children, says: —

The more I consider the administrative side of such a central agency, the more do I sense the dangers there are in having the personality of the individual more or less lost in a large group of others who are being examined. Under the present methods of examination of children, I have felt that the conditions were neither normal nor fair to them. I wish it were possible to have all the patients meet the physicians in so informal a way as not to give them the slightest indication of what was being done.

Another agency, dealing with 100 children in a year, thought the problem would be too big for the present psychological clinics, and to employ its own alienist would be too expensive. It suggested that, as a matter of economy and practical social administration, we should have to be content at present with eliminating from these examinations all children who are practically up to grade in school, and have not shown themselves to be unusually troublesome or obviously peculiar.

One of the agencies which has advocated and tried a systematic use of mental and psychological tests, writes that: —

A routine mental and psychological examination is of great value in connection with the various problems of child-caring and allied subjects, provided it is done from the point of view of the society and with a social outlook. Such an examination, to be valuable to us, must have a practical significance, and must be done with the same social point of view that we require in a physical examination. To be helpful in placing, the results of the examination must be obtainable within a short time of the examination, and should include definite recommendations as to ideal surroundings, just as, again, the good physical examination carries with it recommendations as to hygiene, etc.

From those agencies caring for unmarried mothers one wrote: —

Such an examination would be both helpful and interesting, but not possible under our present administration because of lack of time and workers.

Another believed that in all cases where there was any question of doubt about the mental condition of the mother, or where her future disposition presents some difficult problem, the examination would be of great assistance; in others it would be an unnecessary ordeal. A third wrote: —

So far as our work with unmarried mothers is concerned, I believe that mental and psychological examinations should be made in every case.

From the family rehabilitation and relief agencies there were more dubious opinions. One wrote: —

So far as including a routine mental examination for all dependent families and the outdoor poor, I am not so certain. Many should undoubtedly be examined. Whether all or not, I should want to think longer before answering. Of course, our charges, from the children to the aged, offer rich material for psychopathic study. Present facilities make it impossible to identify all of the mentally disordered cases which we handle.

Another mentioned the difficulty in having a family which appeared perfectly normal in every respect, submit to an examination, and felt it would be cumbersome to have all families examined.

One other felt that privately supported family rehabilitation agencies could not take advantage of the use of mental tests generally until the public, which supported the agencies, demanded its use.

A critic in close touch with the family rehabilitation agencies said: —

I find myself wondering whether the very compactness and air of finality that belongs to a mathematical rating should not make us more cautious in recommending its use for all, or nearly all, clients of social agencies.

A possible and safer next step on the long road that we have to travel would be the instruction of educators and social workers in the signs embedded in personal and family history and in the symptoms presented by the individual himself, which would indicate the possible need of a mental examination.

From these comments it is evident that the practical need for a better appreciation of the mental status of social clients is already felt to a limited extent. It is undoubtedly but a matter of time, and the education of public opinion before the use of psychological and mental examinations will be established as a necessity in the program of every social agency undertaking the supervision of delinquents, dependent children, chronically dependent adults and women with illegitimate children.

Stated briefly, the most important objections to the routine use of mental tests are as follows: —

1. There is too great difficulty in securing the mental, as well as the physical, examination of large numbers of social patients. This objection is resolved into three parts: (*a*) Where agencies do not have their own psychiatrist there is the difficulty of getting adult patients to go voluntarily to a clinic which suggests possibility of mental trouble in patient; (*b*) the clinics at present are not equipped to handle large numbers; (*c*) the public does not yet appreciate the value of such a proceeding.

2. Many social workers feel there is danger in relying too greatly upon the results of the psychological tests, which in their minds are not far past the experimental stage.

3. The expense of maintaining a psychiatrist or psychologist is too great for the average social agency, and there is danger of lowering the general standard of psychiatric work where individual psychiatrists are employed.

4. Social workers should have more knowledge of psychopathic symptoms and problems in order to make proper use of the results of such examinations.

5. The other objections fall under the head of criticisms of administration.

The first objection is found most evident among the family rehabilitation and relief agencies dealing with the chronically dependent adult. In these agencies it is true that the applicants are largely referred by privately philanthropic persons, and an effort to get these applicants voluntarily to a psychopathic hospital is usually fruitless. It is here also that the public, among whom are these privately philanthropic persons who referred the applicants, will be most quickly aroused to harsh criticism of the agencies' methods. Their untrained sympathies so often resent any appearance of red tape. If, however, the public could see the importance of knowing the applicant's mental status, a satisfactory technic would undoubtedly be worked out. For example, all family rehabilitation and relief agencies must always do a certain amount of emergency or temporary work in order to prevent the possibility of suffering, and acute problems would not, therefore, be hampered by routine. But where constructive work for families or individuals is undertaken, and financial assistance is offered to cover a protracted period of time, a routine system of examination would facilitate treatment greatly, not only because of

its assistance to the social worker in making a well grounded plan, but also because the applicant would not be inclined to resist an examination which would be required of all under similar circumstances. The sting of being singled out as "peculiar" would be removed. One research worker has suggested that a beginning be made by securing systematically a physical and mental, or psychological, examination for the members of any family which has not been able to establish its social independence within two years. The time element, of course, would not be significant with those families for whom an adequate pension and supervision over several years has been planned by an agency,— in such families, for example, as those of widows, of certain deserted wives, and those in which the breadwinner suffers from an incurable disease. But with these latter families, as previously suggested, one should have a knowledge of the mental and physical condition before determining the plan for their future.

With the children's agencies, the difficulty in securing mental tests lies chiefly in the proper handling of large numbers. The State Minor Wards, for example, had 6,072 children under their care during the year reported on. If this agency had begun with the 850 children, whom they received during that year, there would not have been more than three patients a day to be examined. A complete psychological examination, including the point scale, the Binet and Healy tests, seldom takes over two and a half hours.

The agencies dealing with unmarried mothers would also obviate their great difficulty in getting the patient to the clinic if the tests were given as routine.

That the clinics are not yet prepared to examine as many patients as such general use of mental tests would necessitate, may be true, but the inevitable law of supply and demand would regulate this. Not only would the present clinics be better equipped, but new clinics would be opened.

The second objection — the danger of relying too greatly upon the ratings of the psychological tests and the distrust expressed as to the practical value of these tests in their present stage of development — is one that is often heard from social workers. It is, however, ungrounded except where unwarranted claims have been made for the tests. When used by skilled psychologists, the results of the examination have definite values, and lend themselves to practical interpretations. The special

worth of each method of examining should be known, and it is usually advisable to combine two or three different methods of testing in order to check the results.

The third objection — the expense involved should an agency employ its own psychiatrist and develop an independent small clinic of its own — is one which can be met only by the education of the public which supports these agencies. Four of these twenty-seven organizations already have an examining physician in their employ, and for them it would be necessary only to add a psychologist, and the usual psychological equipment. Both the physician and the psychologist should have had experience in a psychopathic hospital or a psychological clinic. Social histories are already obtained and required by most social agencies, and if, in addition to the physical and mental examinations, arrangements were made for the taking of the Wassermann test on every case possible, the individual clinic would meet the needs of the average applicant, and could decide which individuals should be sent to a psychopathic hospital for observation and more thorough study.

By eliminating the less difficult cases of these agencies in this way, the demand upon the hospitals would be diminished. With such a system, agencies which assume the care of children or individuals over a period of years would have the means of making careful records of the mental improvement or deterioration of those under their care during the time known to them. An examination should be given at intervals of at least three years, but if the individual is supervised for less time, the examination should be given at least upon his admission and discharge.

The work of giving mental and psychological examinations should not be entrusted to social or eugenic workers, unless they have had, as a background, special training as physician or psychologist. The mere formality of subjecting a patient to a Binet or other mental examination will not meet the need which this paper has attempted to point out. Physicians and psychologists employed by social agencies as independent examiners should endeavor to standardize their work by securing as nearly uniform data as possible, and should have some means of interchange and discussion of methods and results.

The fourth difficulty, found in the lack of knowledge of psychopathic problems on the part of the social workers, is one that is generally felt. It is not only acknowledged by social workers, in their inability satisfactorily to select patients for

examination, but also in the difficulty which they find in dealing with the non-committable psychopath. That social service departments of psychopathic clinics should undertake to supervise all of these non-committable cases, especially where another agency has already established friendly relations, is impractical, But that social workers in training should have certain courses on psychopathic problems, and a required amount of practical experience in a psychopathic hospital or clinic, is undoubtedly the final solution of the difficulty.

Objections to the administration of the clinic, such as complaints made of the manner of approaching the subject of examination to a patient, etc., may be based on exceptional instances. Mistakes would be corrected, if reported to the proper authority.

Aside from the special study of their charges from the mental point of view, social agencies should develop a system of indexing their psychopathic patients so that, whether using routine examination or not, these patients could be readily referred to. Certain social organizations find it expedient to keep an index of the community problems which appear from day to day in their case work.[17] For example, those families under their care in which is found disability from industrial accident are indexed in a section so named. Other index headings include child labor under fourteen, dependent widows, blindness, illegitimacy, and various problems of current interest. In such an index there should be introduced a section for the insane, the feeble-minded and the epileptic, and a fourth one entitled, "Other types of nervous instability." This fourth group of nervous patients would include those social patients commonly referred to as "queer" and "particularly troublesome and difficult to work with" as well as those whose social history suggested mental disorder or defect, but whose examination resulted in a diagnosis of "not insane" or "not feeble-minded" at the particular time stated.

The social organizations making use of such an index have found a particularly effective use for it in their publicity work. and in the preparation of special leaflets and pamphlet studies, preparation of annual reports, legislative campaigns, provision of data for commissions and social investigations, as well as for the intelligent supervision of their own work.

The agencies which will so index their mental patients will be ready with valuable material for the propagandists and students of mental diseases. They will also be taking a first step toward

the establishment of a larger institution, namely, state registration of all insane, feeble-minded and epileptic.

Without a systematic study of their charges, with an eye to identifying those with mental disorders, the organizations giving relief, readjusting home and industrial conditions, promoting prophylactic measures, or caring for the welfare of the child, cannot estimate the part which the psychopathic patients play in their respective problems. Whether or not a patient is committable to an institution is not the all-important question for the community. How to deal with those patients who are not committable — most of whom must return to their former friends and helpers — should interest each organization even more than the weeding out of the committable ones.

Recommendations.

1. A way should be provided by which all social workers in training should be given instruction in the social and general signs of mental diseases. This instruction should include experience in work with psychopathic patients.

2. Social organizations of every type should keep an index, either by signal or card catalogue, of the insane, epileptic, feeble-minded and distinctly asocial persons enrolled.

3. There should be developed a central bureau of registration for persons included in the above four types.

4. All agencies dealing with unmarried mothers, delinquents and dependent children, should establish as an essential routine a careful physical and mental examination of every individual under their care.

5. Agencies dealing with dependents who are not delinquents should establish as part of their necessary routine a system by which families or individuals dependent for more than two years, or families for whom an agency is planning to give considerable aid and supervision, shall be given a thorough physical and mental examination as early in the treatment as possible.

6. All children in the care of social agencies, whether normal or border-line, should be given mental examination upon admission and discharge, and if supervised for several years should be examined at intervals of from three to five years.

7. The existing psychiatric clinics and psychopathic hospitals should be enlarged and equipped to meet the increasing demands made upon them.

8. When these centers can no longer care for the patients, other psychological clinics and psychopathic hospitals should be supplied.

9. Should social agencies prefer to employ their own psychologists or alienists, these specialists should work together in such a way that their work would be standardized and the data be as nearly uniform as possible.

10. All psychological or mental examinations should include the Wassermann test for syphilis, as well as a physical examination and social history.

REFERENCES AND LITERATURE.

1. SOUTHARD, ELMER E.: "The Psychopathic Hospital Idea." Contributions from the Psychopathic Hospital (Dept. of the Boston State Hospital) No. 26 (1913.26), p. 6.
2. "Annual Report of the Psychopathic Department of the Boston State Hospital, 1913-14."
3. HUNTINGTON, J. V.: "St. Vincent de Paul, the Fruits of his Life." Introductory Lecture of the Third Annual Course of the Philopatrian Institute, Philadelphia, 1852.
   O'MEARA, KATHLEEN: "Frederic Ozanam, his Life and Works," 1876, pp. 75, 76.
4. MASTERMAN, N.: "Chalmers on Charity." Westminster, 1900.
5. HILL, OCTAVIA: "A More Excellent Way." From "Our Common Land and Other Short Essays." London, 1877.
   HILL, OCTAVIA: "A Few Words to Workers." Published in the report of the Charity Organization Society of Baltimore, October, 1899, No. 23.
   MAURICE C. EDMUND: "Octavia Hill, Life as told in her Letters." London, 1913.
6. KRAEPELIN: "Psychiatrie." 8 Auflag, III Vol., pp. 863–865.
7. FRANZ, S. I.: "Handbook of Mental Examination Methods."
   WHIPPLE, GUY MONTROSE: "Mental and Physical Tests," 1912.
   STERN, WILLIAM (translation by G. M. Whipple): "Methods of Psychological Examination."
8. BINET-SIMON (translated by Clara Town): "A Method for measuring the Development of the Intelligence of Young Children." 1912.
   BURT, CYRIL: "Measurement of Intelligence by the Binet Tests." Eugenics Review, Part I, in Vol. VI, No. 1, April, 1914; Part II, in Vol. VI, No. 2, July, 1914.
9. HEALY-FERNALD: "Tests for Practical Mental Classification." Published in Psychological Monograph, March, 1911.

10. YERKES-BRIDGES: "The Point Scale, A New Method for measuring Mental Capacity." Reprint from Boston Medical and Surgical Journal. Vol. CLXXI, No. 23, pp. 857–866, Dec. 3, 1914. Published in Boston, W. M. Leonard, 1914. References, 1–pp. 8–9–2.

YERKES, ROBERT M., BRIDGES and HARDWICK: "The Point Scale for Measuring Mental Ability." Published in Baltimore, Warwick & Yorke, 1915.

11. KNOX, HOWARD A.: "A Scale, Based on the Work at Ellis Island, for Estimating Mental Defect." Published in Journal A. M. A., March 7, 1914, Vol. LXII, pp. 741–747.

12. SHIER, A. R., Acting Assistant Surgeon, U. S. N.: "Review and Possibilities of Mental Tests in the Examination of Applicants for Enlistment." U. S. Naval Medical Bulletin, April, 1914.

13. SHEEHAN, R., Passed Assistant Surgeon, U. S. N.: "Service Use of Intelligence Tests," U. S. Naval Medical Bulletin, Vol. IX, No. 2.

14. SOUTHARD, ELMER E.: "The Psychopathic Hospital Idea." Published in Contributions from the Psychopathic Hospital, No. 26 (1913.26), p. 5.

15. LUCAS, W. P.: "Wassermann Reaction in its Application to Medicine." Published in Contributions from the Psychopathic Hospital (1913.2).

Symposium on Neurosyphilis. Psychopathic Hospital, May, 1915.

16. WOODS, ROBERT A., and KENNEDY, ALBERT J.: "The Settlement Horizon." To be published by Russell Sage Foundation in the near future.

17. Report of the Committee on Statistics of the American Association of Societies for Organizing Charity. Charity Organization Statistics. Published by Russell Sage Foundation, 1915, pp. 133–135.

A PSYCHIATRIC CONTRIBUTION TO THE STUDY OF DELINQUENCY.

By Herman M. Adler.

Classification.

The subject of delinquency is one which has attracted the attention of experts in many fields from earliest times. Of late years there has been a tendency to regard delinquency as a manifestation of abnormality if not of disease. There has been considerable discussion as to whether criminology should not be taken from its close association with law and placed in more intimate relations with psychiatry. In the eyes of some it is in itself a branch of science. Others regard it as merely a borderline science between law, medicine and economics.

While it is undoubtedly an encouraging fact that the attitude of the community towards delinquency is rapidly changing, and is assuming more the position of sympathetic inquiry into the causes and remedies, it is none the less a fact that the law remains as of old,— sternly searching for the responsible parties.

The medical sciences are pushing on into this new and undiscovered field, and are outstripping their phlegmatic, more ponderous and cautious neighbor, the law. The social worker, battling in the wake of the medical man, is impatient at the law's delays, and is somewhat perplexed by the discrepancy between the medical point of view and the legal point of view. We are too apt to blame the law and to exalt science in this connection. As a matter of fact, we are forced to the conviction that the law will be changed the instant that science gives a definite basis for such change. The truth is that medicine, and psychiatry in particular, has not yet delimited the problem or discovered sufficient facts to warrant definitions of such precision that the law can note them.

At a meeting held during the winter of 1916, at the call of the Massachusetts State Board of Insanity to discuss the problem of the defective delinquent, a great many of those present expressed the wish which was in the minds of all, — that the term "defective delinquent" be defined. Dr. Walter E. Fernald, as one of the sponsors of the defective delinquent law, chapter 595, Acts of 1911, replied that the definition was not important because we all knew what we meant by the term "defective

delinquent," in general, and that whatever the definition might be, the law recognized the classification, and that therefore it had become a legal rather than a medical problem.

This represents fairly the position of nearly everyone who has to deal with this subject. We all recognize the term, and in a good many instances agree in the diagnosis. We each of us, however, have our own ideas and prejudices in regard to delinquency, and nobody wants to set up a hard and fast definition such as would be necessary from a legal point of view. While this is an eminently scientific attitude, it has its disadvantages in that it causes disagreements among experts in passing on specific cases, and in that it confuses the judges and other officials who have to deal with the correctional side of the problems involved.

According to the definition contained in the above-mentioned law, a defective delinquent is, first, "an individual who has committed an offence not punishable by death or imprisonment for life, but who ordinarily might be committed to a State prison, a reformatory, jail or house of correction, to the State Farm or the industrial school, a truant school, or to the custody of the State Board of Charity as mentally defective," and second, "an offender while under commitment to any of the institutions or to the Board named above, who persistently violates the regulations of the institution or the Board in whose custody the offender is, or who conducts himself or herself so indecently or immorally, or otherwise so grossly misbehaves, as to render himself or herself an unfit subject for retention in said institution or by said Board, and who is mentally defective."

The two points in this definition are, in the first place, that the individual is found *mentally defective*, and, in the second place, that he *persistently* violates regulations or conducts himself in some *unusually* offensive manner. Under this law, of course, great latitude is given to the physicians who certify to the diagnosis, in that it is not definitely stated just what constitutes mental defectiveness. In the second place, the element of delinquency is not fairly defined, since a persistent violation of the regulations of the institutions is made sufficient for the diagnosis. While, no doubt, this allows of sufficient liberality of interpreting the law, and in this respect is wise, it is not sufficiently definite in delimiting the classification, so that in case of a difference of personal opinion it would be very hard to decide which contestant was right.

The element of defectiveness usually is interpreted on the basis of some set of intelligence tests, such as the Binet-Simon, the Yerkes-Bridges or the Terman scale. Granting for the moment that it is possible by means of these tests to determine mental defect accurately, it is the experience of everybody that a group remains that is proved not defective by these scales, which nevertheless presents the same problems in regard to delinquencies that are observed in the frankly feeble-minded. According to the defective delinquent law as proposed, a certain amount of reclassification in the different institutions would be possible, and disturbing elements might be sent to a place especially provided for them instead of being mixed with the more tractable inmates of the schools for the feeble-minded, the State hospitals, and so forth.

No provision is made by this act for the group of cases that are proved not defective by intelligence tests, and who none the less show in many ways that they are not fully endowed.

In England, August, 1913, a law was passed which is commonly known as the "Mental Deficiency Act of 1913," and which became operative on the 1st of April, 1914. This act deals not only with defectives in the common understanding of the word, but also with the individual who is not defective or not insane, but, none the less, subnormal. The law, as it stands, begins with a definition of defectives, which are divided into four classes: —

1. *Idiots;* that is to say, persons so deeply defective in mind from birth or from an early age as to be unable to guard themselves against common physical dangers.

2. *Imbeciles;* that is to say, persons in whose case there exists from birth or from an early age mental defectiveness not amounting to idiocy, yet so pronounced that they are incapable of managing themselves or their affairs, or, in the case of children, of being taught to do so.

3. *Feeble-minded* persons; that is to say, persons in whose case there exists from birth or from an early age mental defectiveness not amounting to imbecility, yet so pronounced that they require care, supervision and control for their own protection or for the protection of others, or, in the case of children, that they by reason of such defectiveness appear to be permanently incapable of receiving proper benefit from the instruction in ordinary schools.

4. *Moral imbeciles;* that is to say, persons who from an early age display some permanent mental defect coupled with strong vicious or criminal propensities, on which punishment has had little or no deterrent effect.

The main contribution of this law seems to be that its definitions are sufficiently accurate for ordinary purposes, and yet make adequate allowance for the special needs of individual cases. Particularly useful is the definition of moral imbeciles, though the term is open to discussion, which calls for "strong vicious or criminal propensities, *upon which punishment has had little or no deterrent effect.*"

It is not possible to say anything in regard to the workings of the English law, since it went into force only a few months before the outbreak of the European war. It would be interesting to know how the term "mental defect" is interpreted in the application of this law, and whether the certifying physicians will require a failure to pass the Binet-Simon tests in order to allow the diagnosis of "permanent mental defect."

Kraepelin, in the eighth edition of his "Psychiatrie," introduces the term "oligophrenia" for the English "feeble-minded." He says, in discussing this group, that this is an extremely varied group of disease forms showing only a single common characteristic, namely, "early disturbances of the general psychic development." Kraepelin considers that these defects are caused regularly by a pathological lesion affecting in some way the physical foundations. He recognizes the cause of all defects in spite of many difficulties as trifold, namely, hereditary degeneration, an injury to the germ plasm and acquired disease. It is interesting to observe that in the same volume Kraepelin groups the so-called moral insanity under psychopathic personality, and not under the oligophrenias. The main distinction lies in this point, that psychopathic personalities, which include the groups to be mentioned below, are characterized by circumscribed defect of psychic development. This contrasts psychopathic personality with oligophrenia, in that the former is a circumscribed infantilism, whereas the latter is a general or diffuse infantilism.

Kraepelin classifies the psychopathic personalities as follows: —

1. *Excitability* (*die Erregbaren — Kraepelin*).

The chief characteristic of this class is that the individuals are, as a rule, brought to the attention of the physician or to the courts as a consequence of a violent excitement which was the

result of external irritation. As a rule, this excitement has resulted in actions which have endangered the life and health of the patient himself or of strangers, or in some way endangered the public safety. After the disappearance of the excitement, as a result of the protection and treatment of the psychiatric clinic, opportunity is given to the physicians to get an insight into the personal peculiarities of the patient. The intelligence of these individuals is, as a rule, above the average. The most prominent characteristic was naturally a strong emotional instability. Patients are easily enraged, start a brawl on trivial grounds, fall into the most violent passions, with assaults upon themselves or their surroundings. The most important clues to the personality of these individuals are rendered by the knowledge of the causes which lead to their being brought to the clinic. In 62 per cent. of Kraepelin's cases this cause was attempted suicide. Seventy-one per cent. of the women admitted were brought on that account; only 50 per cent. of the men. The most frequent causes for the suicidal attempts among the men were disagreements with the wife or sweetheart, unhappy love affairs, unfaithfulness, anger and contentiousness. More rarely the cause was unemployment, reproaches or charges, threatened punishment; occasional causes, because of the death of a child or of a sweetheart, financial difficulties of various sorts. In a number of cases the suicidal attempt was made in a state of intoxication; also the contentiousness, unemployment, punishment, etc., were frequently associated with alcoholic indulgences.

The causes in the women were mainly disagreements with relatives, with employers or neighbors, disagreements with husband or sweetheart, unfaithfulness, jealousy, and so forth. In occasional cases there were criminal charges, a fear of punishment, fear of operation, the death of a relative, illness of the sweetheart, financial difficulty of various sorts.

Very frequently these attempted suicides are associated with marked histrionic characteristics. The patient attempts to commit suicide by choking herself with the hands. The patient makes minor scratches on the skin with a knife. They write touching farewell letters or meet the slightest occasion with threats of suicide. As a rule, they quickly calm down and are nearly always glad that the attempt failed. Usually they characterize their attempted suicide as "nonsense," "stupidity," even laugh over it, and declare that they will be very careful in the future not to repeat it.

Next to the suicidal attempts the most frequent causes for bringing patients to the hospital were paroxysms of rage, assaults, and so on. In this class the male sex predominates. In the paroxysms of rage the patient may attempt to injure himself, or he breaks up the furniture in the surroundings, threatens the children or the members of the family with revolvers, knives, clubs, chairs, and so forth. Very striking is often the minor nature of the exciting cause which produces these unmeasured excesses. A simple correction, the denial of a small wish, a little gossip, an unwelcome order of the physician in the hospital, the mere taking of a patient to the place of detention suffice to evoke a paroxysm of rage which increases in severity as the forms of expression take on a violent nature. Alcohol is here again often a factor which the patient may have taken previously to drown his sorrows or to strengthen his courage.

Consciousness is frequently clouded during these paroxysms. This period of excitement lasts a very short time, rarely longer than a few hours. As soon as the patient has spent himself or has been removed from his environment, composure and clear consciousness rapidly return. As a rule, they are still somewhat irritable, will not eat or give information, but soon they adjust themselves to the situation, and attempt to re-establish their relations with the outer world. The recollection of the incidents is often somewhat unclear. Some patients refuse to believe the details that we tell them; they attempt to put their conduct in the best light — place blame on the environment, on the relatives, and so forth.

The prognosis is, on the whole, favorable. Occasionally the attempt at suicide succeeds. Many patients suffer seriously from the results of the acts of violence or from excessive use of alcoholics. The attacks of excitement may recur frequently according to the temperament and the social conditions of the patient, but as a rule the tendency to these attacks diminishes from the end of the twenties. A third of Kraepelin's psychopathic cases belong to this group of excitable ones, 60 per cent. of these being female. The greatest number of the cases belong to the years between fifteen and twenty-five. After the fortieth, and still more, after the fiftieth, year there is a rapid decline of the number of cases. The majority of the patients were single.

Kraepelin goes on to discuss the relations of this form of psychopathic personality to manic-depressive insanity on the one hand, and psychoneurosis on the other. A characteristic of

this class is the failure of the self-control in the face of very strong emotional influences. The excitement, however, which passes off after a short period, is associated with definite external causes. Between the episodes the patient may appear quite peaceful and sociable till some particular occasion evokes a loss of temper, but even then, when they are very contentious, they may be calmed. They do not show the persistent spitefulness which marks permanently as a foe any one who has seriously incurred their displeasure.

2. *Instability* (*Haltlose*).

The second group of psychopathic personality is characterised by the suggestibility of the will which controls the entire life course. The intelligence in most cases is good, in a fewer number it is below the average, or even poor. Some even appear to be above the average. They are usually good observers and have insight into the weakness and peculiarities of their entourage. They know how to display their talents. They have very little perseverance, and no inclination to exert themselves. They are absent-minded, easily fatigued and diverted, and therefore very rarely can follow a systematic educational course to its conclusion. They are very superficial. They easily acquire knowledge, but do not apply it in any way, and soon forget it. Memory is usually poor and untrustworthy. These patients show a remarkably active imagination. They tend to exaggerate, to embroider their narratives, to picture themselves in ideal situations, to invent stories. They imagine they are wealthy, belong to the nobility, and so forth. They buy things on credit at stores under false representations. Often they seem to have no realization of the truth. One patient thought that he hypnotized himself. Of another it was said "he lies even when one is watching him." Many patients show artistic talents. They develop ideas for moving-picture scenarios, write sentimental or fantastic poems, occupy themselves with the literary and dramatic problems, read a great deal,— papers, books, poetry, and so on. One incorrigible tramp declared that what he demanded of life above all were the intellectual luxuries which he had so long gone without. The theatre, as a rule, exerts a great attraction for these people. Some of the patients were actors or comedians; some were musicians who sang and played in restaurants.

The fundamental emotional tone seems to be one of cheerfulness and self-confidence. The patients feel that they are destined to do great things. They want to do something better than the average. In other cases the mood is depressed, or at least more sober. The patients feel that they are unlucky. They have doubts as to their future. They worry about their condition in life, complain that their life is a failure, they have no luck, they are lonely and forsaken. Nothing pleases them, everything appears hard, they have no friends. They frequently threaten suicide and even plan it, rarely, however, finding the courage to carry it out. As a rule, one can easily distract and cheer up these patients. In general, the emotional tone is subject to marked variations. There is great emotional irritability, which may result in violent loss of temper. An important characteristic of the conduct of these patients is their pronounced selfishness. They are, as a rule, good-natured, approachable and even amiable, but without any deeper attachment or fellow feeling. Their personal welfare plays the most important rôle in their consciousness. They are not inclined to subject themselves voluntarily to privations. On the contrary, they demand comforts and the satisfactions of their often very immodest requirements, and interpret every limitation as an undeserved insult. They are very pleasure loving.

The most severe disturbances, however, are in the region of the will. This shows itself often most markedly when the patient leaves the protection of his home. It results, in the first place, in a very apparent lack of perseverance and thoroughness in work. They usually begin to work with great enthusiasm, but soon lose interest, become distracted, and absent-minded, and commit gross errors and negligence. One says of such a patient, "He was very useful when he wanted to be." "A painter made only sketches without ever finishing a picture."

The patients may also suffer from hypochondriacal troubles, which interfere with their self-support. These patients are very much worried about their health, easily feel ill, perspire freely, have headaches, extreme prostration after they are beginning to work. This instability becomes a very serious portent for the patients. They lose their positions. Under suitable guardianship they are able to live a life free from grosser disturbances, although they are, on the whole, weak and inadequate in their work. They fill in their spare time with loafing, with recreation without previous fatigue, with cures without sickness, and so on.

They are, further, extremely open to bad influences, and are ever ready to descend into bad company. They soon get involved in gambling, fast living, and so forth. A very bad influence in this condition is exerted by alcohol. Of Kraepelin's male patients, 64 per cent. became alcoholic; of the females, 20 per cent. The alcohol increases their irritability, reduces still further their weak will, and destroys often the last remnant of ability to work. Occasionally the picture of pseudo-dipsomania is developed. The patient will be sober for months, and then, on an occasion when his weak will is overpowered, will commence to drink inordinately, and will not stop till he is profoundly intoxicated or his means give out. In this case it is not a depression which drives the patient to alcohol, but a perfectly accidental occasion, such as the meeting of a friend or a farewell feast or the like. Therefore one cannot speak of a periodic relapse in these cases. On the contrary, it is external circumstances which are the decisive factors. Furthermore, the patient does not become excited as a result of alcohol, but merely intoxicated.

An important phase in the life of these patients also is sex. These people are usually sexually very active, and under the influence of their emotions, strengthened by alcohol, are guilty of the most shameless excesses. The inability of these patients to resist temptations from without induces the patients to live far beyond their means. They acquire expensive habits, drink champagne, buy unnecessary articles, treat their friends, give magnificent presents to women, and so on. They soon get into financial difficulties, sell or pawn their own or other people's valuables, and thoughtlessly make debts.

A large percentage of these patients,— 54 per cent. of the men, and perhaps 33 per cent. of the women,— become involved in difficulties with the law in the course of their gradual downward career. In the case of the men, the delinquencies are usually theft; next in frequency, swindling and forgery. In other words, these are delinquencies which are favored by want and opportunity. Considerably rarer are begging and assault, vagabondage and counterfeiting, and so forth. One sees, however, that the criminology of these patients is brought out by their economic incapacities. The principal delinquency in the case of women is prostitution. Almost as frequent, however, is theft; then, again, swindling. The influence of alcohol can be recognized in all these instances in addition to the social and economic deterioration. The patients themselves are aware

of this gradual demoralization. Occasionally, it is true, they assume the attitude of indifference, making no attempt to pull themselves out of the difficulty. As a rule, however, they sense, at least occasionally, the true significance of their condition and evince regret, or they repent and make good resolutions for the future. They may even make an attempt at carrying out these resolutions, but soon give it up and succumb to the first accidental temptation. Very frequently, these patients decide on suicide. A close examination of these attempts shows that the occasion for the suicide was of trivial character. A large number of these took place under the influence of alcohol. The method employed in most of these cases is, strange to say, the same in men and women, namely, poison, probably because in this case we are dealing with individuals with weak will who are disinclined to action. Most of these attempts are carried out in a superficial, inadequate, often silly manner, and are usually not successful.

A certain group of these cases, especially in women, show some of the symptoms of hysteria. Physically, these patients show a tremor, stigmata of degeneration, increased reflexes, headaches, insomnia, gastric neuroses, and so forth. In another series of cases an increased sensitiveness to alcohol is noted.

The prognosis is rather serious. It is this group which furnishes the members of the so-called asocial group,— tramps, criminals and prostitutes. Under careful guardianship and strict discipline the easily influenced will may be protected from evil influence. As soon as these patients are left to themselves, however, their ominous tendencies easily gain the mastery, and start the individual on the downward path. Alcoholism, which soon becomes incurable, as a rule, seals their fate.

This group of cases forms a little more than one-fifth of the psychopathic cases admitted to the Kraepelin clinic. In this case the women form a little more than a third in contradistinction to the excitable ones.

In regard to the age of onset of this trouble the men and the women differ somewhat. The women reach the highest number immediately after leaving the protection of the family or the school, that is, between the fifteenth and the twentieth year. From then on there is a constant diminution which makes the female sex, practically, disappear from the table. After the thirtieth to thirty-fifth year this may be due to the fact that most of the permanently deteriorated individuals gradually succumb to prostitution or the minor crimes; also those that

do manage to marry, or otherwise find maintenance are sufficiently protected to prevent the most serious difficulties.

The male patients show smaller numbers than the females between the fifteenth and twentieth year. After that, however, the number remains larger than that of the women, and reaches its maximum between the twenty-fifth and the thirtieth year. It shows principally that there are causes at work which even after the full growth has been attained tend to weaken the will and self-control. There is another factor, however, which counteracts the natural maturity, and which increases the number of those that have gotten into difficulties on account of their instability, namely, alcohol. Here, again, it seems that this is a difficulty experienced mostly by unmarried individuals. Little can be said in the case of both of these groups as regards the heredity element, the material at hand being insufficient to draw conclusions.

The picture just drawn thus makes it clear that we are dealing with the manifestations of a psychic immaturity. It would seem that a true treatment is excluded from the beginning. The possibilities of education and training depend entirely upon the severity of the disturbance in the individual cases. Of course, the most important thing is to protect them from alcohol. This is extremely difficult under the existing conditions.

3. *Psychopathic Trend.* (*Triebmenschen.*)

This is a tentative group of psychopathic personalities which have the common characteristic that their conduct is controlled by spasmodic will impulses. Whereas the resolutions of a healthy person, especially those which have a broad significance, result from balancing reasons and counter reasons, in these cases one finds that a very large proportion of the will impulses originates in tendencies which bob up from the unconscious or the subconscious, and which press for outlet.

Again, the intelligence of these patients is as a rule good, occasionally not good, at times even excellent. There may be even talents or æsthetic appreciation of music, theatre and so forth. Most of these patients show a certain amount of intellectual activity and artistic ability, converse well, have good ideas, express themselves skilfully, are good at repartee, make witty remarks. Sometimes they complain of distractibility and increased fatigability. These patients have almost regularly a very good opinion of themselves. They are very vain, arrogant, think that they are born to a better sphere than they find

themselves in, are special people, are sure of a great future, are boastful, and so forth. They are not particular about the truth. They have from early youth a decided tendency to embroider their remarks, to invent, to lie. They often are not conscious of the tendency to this falsification of actualities.

Emotionally, these patients are good-natured, sociable and cheerful. Some are ecstatic, others opinionated, some inconsiderate of others, arrogant and contentious, and present great difficulties to their teachers. On the whole, they appear optimistic and self-confident, but frequently this is subject to marked variations. Occasionally one finds these patients in a depressed or unhappy frame of mind, even in despair. At other times they are irritable, sulky, sensitive, easily wounded, complaining. A large number of these patients express their dissatisfaction with life by means of true suicidal attempts. There are frequent outbursts of temper. Very frequently from time to time there are emotional depressions without any adequate cause. In these the patients become reserved, are silent and feel disgusted about everything. It is just these depressions which form the starting point for all sorts of impulsive acts. Occasionally one observes here also instances of groundless fear.

The most severe disturbances are noted in the actions and conduct. These are influenced in the highest degree by the spasmodic will impulses which throw overboard all sensible intentions and plans.

There are three principal forms of these impulsive ones — the profligate, the truant and the periodical drinker. It is possible that there is a series of other forms of psychopathic personality that belongs here.

In the first subgroup, that of the profligate, the most marked characteristic is the strong tendency to unlimited squandering. The natural result of the sort of life these people lead is an accumulation of enormous debts. A very unfavorable influence on the fate of these patients is exerted by lack of perseverance. They can endure nothing very long, they change their positions or their occupation,— often without any cause,— wander restlessly from one place to another, and make plans upon plans without actually carrying them out.

The patients as a rule show little insight into the peculiarities of their conduct. They do not understand how they could have done these things, or they blame their relatives, neighbors, and so forth. Again alcohol plays an important rôle in these cases.

The second group of these patients shows the instability principally in its tendency to aimless wandering. In one group of cases the impulse to go away appears quite without warning. The patient suddenly gets an idea he must go to Trieste, Hamburg, Vienna, Paris,— occasionally in connection with some pathological depression or anger. Sometimes the accidental possession of a large sum of money may be the cause of this. As soon as they feel the impulse they proceed to act. The patients disappear, wander and travel about, here, there and everywhere, according to their whim. At times they are weeks and months in foreign lands. These impulses recur sooner or later, often within a few weeks or months. The patient is at no time able to resist these impulses. The age at which this occurs most frequently is between the tenth and fifteenth year. It has been observed in the third year.[1] This occurs chiefly in the male sex. This group, however, is not a uniform one. Aside from the epileptic and hysterical cases there are a number of individuals who wander because of their lack of family sense, their desire for adventure, and so forth.

There is a subgroup of cases here in which the unquenchable desire to wander into the world becomes a permanent personal pecularity. These patients nowhere find rest, and they form the tramp type that is known in all countries.

There is a group known as *Orientkunden*, Orient tramps. These are people who are attracted to the Orient on account of the ease with which they are able to live there without steady employment, and the freedom from closer supervision of the western civilization. These people find it difficult, if not impossible, ever to return to the well-regulated conditions of European civilization.

The third group under this heading includes individuals who periodically consume enormous quantities of alcohol. This attack apparently is in close connection with depressions which appear without any apparent cause. The patients are irritable, disgusted with their lives, with their surroundings, and feel compelled to do anything that will free them from this state of mind. They disappear, wander about and start to drink inordinately. Occasionally such a patient may come to the hospital in order to forestall the excesses. In the interval between the attacks the patients are usually very sober and temperate. Frequently, however, they finally become chronic alcoholics. Usually they show a number of other psychopathic

traits, — moodiness, lack of endurance, and so forth. Since these patients usually have average intelligence, they may have good insight into their shortcomings. This group of impulsive individuals included about 2 or 3 per cent. of the psychopathic subjects entering the Munich clinic. Practically all were men. The main characteristic of these psychopathic conditions lies in the overpowering of the normally regulated will and intelligence by spasmodic impulses. In the co-operation of the various tendencies that strengthen the will, those attain unusual power which arise in the general moods and vital desires of the individual as opposed to those guiding and inhibiting impulses which ordinarily control them and which are the result of training and experience. One of the fundamental dispositions which gives rise to impulsive tendencies is, above all, the desire to dominate in a purely external fashion. A direct result of this is the tendency to boast, to lie, to squander money in so far as an impression is made thereby. The second important vital demand is a life of pleasure. Somewhat harder to explain is the restlessness which underlies the tendency towards vagrancy and dipsomania. Even normal healthy people are familiar with the desire to change their environment after a period of routine and confining duties. Probably a good part of the attraction of novelty depends upon the stimulus towards new thoughts and actions, and freedom from tiresome routine. Thus one might speak, as the fundamental cause of the restlessness of the individuals, of a sort of demand for liberty. It seems that this may be the same instinct which causes animals to wander about, and which makes captivity so unbearable to the wild animals. This has been overcome by laborious domestication, and in man by the development of the social sense.

The Eccentrics.

A small group of psychopaths whose clinical definition is still very doubtful is the group of eccentrics. They include the pathological liar and swindler (the "pseudologica fantastica" of Delbrück), which is characterized in the main by an increased mobility of the fantasy and irregularity and aimlessness of the will.

The Anti-social Individuals.

The anti-social individuals are included in a group that has adequate intelligence, but has a certain dullness of perception in regard to social customs. They are disinclined to work, are

lazy, untruthful, irritable, vain, self-satisfied, and, most important of all, are incapable of any deep emotion. Another important accompaniment in these States is a lack of sympathy for others. The sexual desires of these people are awakened early and lead to all kinds of delinquencies. Petty larceny is a frequent accompaniment. Of very serious import to these patients is the tendency to the recurrence of their delinquencies, in spite of warnings and unpleasant experiences.

The prognosis in these cases is doubtful, but by no means always unfavorable. A very significant experience with them is that a number of criminals of this group later on developed mental disease which ended in marked deterioration: especially prominent in these cases was the paranoid form of dementia præcox. The greatest number of these people were unmarried, and about one-fifth were alcoholics. A further number of cases showed active syphilis. Most of these people showed various stigmata of degeneration, cranial deformities, squinting, speech defect and so forth.

Kraepelin proceeds to discuss the relation of the milieu or outer environment to the formation of anti-social personality, and comes to the conclusion that while it has unquestionably some effect, it is not clear that this need necessarily be an important one, since heredity can always be shown to play a rôle in these cases. It is impossible in the present state of science, according to Kraepelin, to answer all the questions that have been raised in this connection. One thing may be deduced, and that is that this inability to adapt one's self to the demands of human society is the result of an impoverished emotional life.

This congenital lack of proper emotional reactions is generally called moral insanity (Prichard, 1835), or the "folie raisonant" of the French. The treatment of these patients must begin, so far as possible, in early childhood by means of education. Prolonged good effects can be hoped for only in those cases in which no pronounced criminal tendencies exist.

Contentious Individuals.

The intelligence of the contentious individuals is usually moderate though not subnormal. There is an increased emotional irritability and increased egoism. This also is an unclear group, midway between one of the previously mentioned ones and the *Querulantenwahr* (litigation psychosis). So much for the

classification and description of this class of cases as given by Kraepelin.

It is clear that we are dealing with a group of individuals who are so nearly normal that it is only in the course of years and by the effect of cumulative evidence that they appear in any way different from the average.

There are two main factors to be considered: one is the intelligence of the individual,— his ability consciously and logically to direct his conduct; the other is the emotions. Whatever the peculiarities of the individual, whatever his special experiences in the main, these two factors can be distinguished in his activities.

The former is commonly supposed to be the highest attribute of the mind, to have been acquired at a late stage in the development of the species. The latter is of fundamental significance for the organism, and has developed out of the instincts. Both factors exist in every individual, and practically never operate independently.

In health the two are well integrated. The emotional impulses, the temperamental tendencies, or, to use the word of the biologist, the tropisms, exert often opposing tendencies towards each other and towards the guiding intelligence. There is therefore a very marked distinction between the action of the tropism and that of the intelligence, namely, that the former exercises an episodic effect, whereas the latter is more or less continuous.

William James says that "bodily changes follow directly the perception of the exciting fact, and our feeling of the same changes as they occur *is* the emotion." "Objects excite bodily changes; . . . the changes are so indefinitely numerous and subtle that the entire organism may be called a sounding board." "Every one of the bodily changes, whatsoever it be, is felt acutely or obscurely the moment it occurs." "If we fancy some strong emotion, and then try to abstract from our consciousness of it all feelings of its bodily symptoms, we find ourselves with nothing left behind."[2]

Cannon has recently brought supporting evidence for this theory in his work in connection with the internal secretions and emotions of pain, hunger, fear and rage.[1]

Granting, then, that the emotions are transitory and intense, that they are associated with strong physical effects which are felt by the individual, that they create corresponding memories

and thus lead easily to habits of many sorts, it would seem that in the analysis of individuals, normal or pathological, a consideration of these factors must come first.

It is manifestly impossible to analyze human nature at all adequately in the present state of our knowledge. It also seems probable that many generations of men must pass before this can be done with such a degree of accuracy that scientific prodiction may be possible. This is a situation not unfamiliar to other branches of medicine. Some analogies pertinent to the present inquiry may be made with the study of immunity. Some twenty years ago the immunologists found themselves confronted with a very similar dilemma.

When Ehrlich first proposed his side-chain theory he suggested that it might be a long time before chemistry would be able to explain the phenomena of immunization, as evidently must be done if we are to have an accurate, scientific knowledge of the subject. Assuming symbols for unknown chemical entities, Ehrlich and his school worked out a complex system of immunology which has served its purpose most satisfactorily, and has advanced the knowledge of the subject beyond all hopes, although in the meantime chemistry has done very little to increase our definite knowledge of the specific substances involved in these reactions.

Similarly, it will take the psychologists, the neuropathologists and the physiologists a long time to work out accurate explanations of the recognized phenomena. The painstaking psychological analyses of the individual cases by time-consuming methods is thus placed in a position similar to chemical analyses of immune bodies. Upon improvement along these well-organized lines depends probably the future of this field as well as every other biological problem. In the meantime we need methods which will enable us to deal with the increasing numbers of subjects that come under our professional care, or that perplex the law courts and the schools.

In this sense I propose to classify the individuals that present mental or social difficulties in three groups. These groups are understood to be meant as symbols for unknown quantities rather than as explanations or precise definitions. The three groups are, in the first place, the group in which the intelligence is found to be below the lowest normal level. This is called the group of defectives, or of inadequacy. Into this group fall the feeble-minded, the "Oligophrenias" of Kraepelin, the end

stages of dementia præcox and of other deteriorating psychoses — presenile, organic dementia, and so forth.

The next group of the emotionally unstable includes individuals who have average intelligence or better, but who show in their conduct and in their careers the predominating influence of the emotions. They are moody, changeable, impulsive, and in general it may be said that their conduct itself does not correspond to their beliefs or intentions.

The third group, the paranoid group, includes individuals of average intelligence or better, in whose careers the emotional influences are of secondary importance, but whose main difficulties are a result of mistakes in logical thought processes. The well-known characteristics which are exhibited in extreme form by the paranoid psychoses, these individuals show often to a degree which falls just short of a delusional state,— egocentric ideas and prejudices; everything that occurs about them is referred to themselves. Their first reaction is to determine what effect any extraneous circumstance may have upon themselves. They are selfish, vain and arrogant. If they feel in optimistic mood they are contemptuous of others. If depressed, they are resentful. Though this is a trait of the intellect, it does not necessarily interfere with their intellectual abilities, and these people are often very efficient.

These three groups can be separated only theoretically. There are many cases that are composite, so that their characteristics fall into two or into all of these groups. Thus few paranoid individuals go through life without strong emotional reactions which often lead to social difficulties. Similarly, the emotionally unstable will, especially during paroxysms of rage or depression, often exhibit paranoid symptoms. The defective group may show paranoid tendencies and emotional instability.

The distinction lies rather in the behavior of the individual as observed in the course of years than in a definite quantitative difference to be observed at a single examination. The introspective psychologist will attempt to determine in each individual, by psychoanalysis or other means, what the mechanism of the disturbance is. He may succeed in doing this, and still be unable to predict the future course of the individual.

The behaviorist psychologist will not lay too much weight on the results of a single examination by whatever method, but will lay more emphasis upon the history of the case and the previous experiences of the individual, and, above all, upon the reaction

of the individual to certain test situations during a period of observation.

This behaviorist method offers the hope of a short cut in dealing with these individuals.

An examination of 100 cases of unemployment[3] made at the Psychopathic Hospital gave the following interesting results. These 100 unselected cases consisted of men between the ages of twenty-five and fifty-five, who had been admitted to the Psychopathic Hospital in the usual way for examination as to sanity or for treatment, and the following observations were made: —

Of these 100 cases 43 were classified as paranoid, 35 as defective, 22 as emotionally unstable. The paranoid and the defective groups, therefore, form 78 per cent. of the cases, which fits well with the generalization that the emotionally unstable, on the whole, are well liked and popular with their fellows; that the paranoid cases, on the other hand, are usually very unpopular.

The number of different jobs held by the individuals arranged in groups are as follows: the total number of jobs of these 100 men were 278 during the five years previous to admission. Of these the paranoid individuals had 134 or an average of 3.1 jobs per patient. The defective had 95, an average of 2.7 jobs. The emotionally unstable had 49, an average of 2.2 jobs. This shows that the paranoid individuals changed their employment oftener, almost twice as often, as the emotionally unstable.

The months employed showed the same relation. Paranoid individuals averaged 20.6 months for each job. The defective averaged 24.3 months, while the emotionally unstable averaged 50 months for each job.

It will be seen from this, as well as from the descriptions given by Kraepelin, which are corroborated by most of those who have had experience with the social problems connected with mental disease, that there is one important difference between the careers of these people and those of average healthy persons. This is, namely, an apparent inability of the delinquent to learn by experience. This fact is taken note of particularly in the English deficiency law, and seems an important point to consider in every case.

When Ehrlich devised his side-chain theory he borrowed a generalization from Weigert. The latter had observed in his

pathological studies that when the body is injured in such a way that complete disintegration does not result, the reaction is an overproduction of defence by repair. Thus a fractured bone when it knits will produce a union which is stronger than the original bone on account of an increase of callous formation. The same is true in the repair of other tissues. Ehrlich made use of this law, which he called Weigert's law, in explaining the reaction of immunity, thus: if toxic substances are introduced into the organism in amounts not sufficient to kill, the individual reacts by an overproduction of defences; — in other words, by becoming immune.

One might apply this to the formation of habits, good or bad; to the acquisition of emotional control in delinquents. If the individual is exposed to conditions which are not enough to disable him permanently he should react by an overproduction of defences. This is implied by the popular proverb, "The burnt child dreads the fire." The defective delinquent in this case might be termed a burnt child that does not dread the fire. The mere burning with all its unpleasant experiences is not sufficient to create the defence habits which will prevent its recurrence.

The thresholds for these reactions must lie at different levels in different individuals. This is a point for analysis in each case. Undoubtedly there are individuals so far deviated from the average that practically no amount of experience, even under the most careful guidance, will produce resistance.

For the purpose of testing some of these deductions a second series of 100 unselected cases was gathered. These cases were taken in the order of their admission to the hospital, excepting only those that presented no definite social problem. They included both men and women. In each of these cases a thorough mental and physical examination was made, a psychological examination to determine feeble-mindedness, and a more or less thorough social examination to determine their difficulties in the community.

While all of these 100 cases had been investigated by the social service department, it was not possible to obtain sufficient information about all of them to enable us to classify in the above manner each case studied. There was, however, sufficient information at hand to enable us to classify 40 of these 100 cases as follows: 16 as inadequate, 3 as unstable, 13 as paranoid and 8 as mixed.

The unstable group, unfortunately, turns out to be too small to be of much use, and the different combinations in the mixed form are too varied to allow of any correlations. Contrasting the inadequate group with the paranoid group we find 17 cases of delinquency in the former and 39 in the latter, or an average of one delinquency to each individual of the inadequate group as compared with three delinquencies to each individual of the paranoid group. The social difficulties of the inadequate group are scattered through a series of delinquencies, such as alcohol, sex, lying, swindling, contentiousness, emotional outbursts and suicidal attempts. In the paranoid group contentiousness and attempted suicides make up one-half of the social difficulties.

An attempt was also made to gain some information as to the careers of the individuals in regard to three points: (1) whether the social condition had improved; (2) whether it had remained the same; (3) whether it had become worse. The inadequacy group were fairly evenly divided in these three respects: 6 cases had improved socially, 3 had remained the same and 7 had become worse. In the paranoid group 4 had improved, 2 had remained the same and 7 had become worse. It is, of course, quite obvious from this statement that these figures cannot be taken as more than an indication of what a study of this sort, if carried consistently through a number of years, might show. None the less, they are, while merely straws indicating which way the wind blows, sufficiently suggestive to justify the conclusion that in the psychiatric analysis of delinquency the emphasis should not be placed upon the delinquency but upon the delinquent.

On account of the attitude that the law takes in this regard delinquents are classified usually without much thought according to their delinquencies. If this analysis does nothing more, it at least serves to show that such a classification is not only of no use to one interested in the therapeutics of this problem, but that it is based upon false assumptions.

The dramatization of a social incident which might have far-reaching influence upon the future career of an individual is of great human interest, but, after all, of minor psychiatric importance. A person who in a fit of rage picks up an object and hurls it at another may find himself merely jeered at by his neighbors if the missile falls short, or may be subjected to a fine in court for breaking a plate glass window, or he may find himself charged with manslaughter or attempted homicide. Each of these criminal charges has an entirely different importance in the

eyes of the law. To the psychiatrist they are the results of the same cause. If such an individual is to be classified by his delinquency he might find himself at one time a disturber of the peace, at another time a murderer.

Furthermore, just as the individual might commit different sorts of crimes, so the same crime might be committed by individuals belonging to entirely different types. It is important, therefore, to be as objective as possible towards what I have above called the dramatization of the incident; to what the newspaper man would call the "news value" of the story; in short, to all those sides of the incident which we have been taught by writers of all sorts to appreciate, and to lay emphasis upon not so much what was done as upon what sort of thing was done.

In every given case of delinquency or social difficulty it should be determined whether the difficulty is chiefly due to inadequate intelligence, to emotional instability or to paranoid disposition. Nothing can be gained by endeavoring to increase the intelligence of a mental defective. Nothing can be expected from an attempt to change the personality of the paranoid individual. A great deal can be accomplished, however, in controlling the emotional instability of those whose chief difficulty is the result of such instability, as well as the emotional difficulties of the paranoid and defective group.

Classification such as the one suggested in this communication is of course entirely too simple to completely satisfy all the demands on the individual cases, and it is to be hoped that this classification may be altered and amplified, or perhaps completely reconstructed till finally a working method may result. But even now, without general information of the subject, such a simple scheme as this one proposed has served not only to keep the ideas of the examiner grouped in orderly fashion, and thus to prevent disorderly and unclear thinking on his part, but it has actually appeared to be of benefit when it was applied as a basis of therapy in these cases.

It would seem that by careful training based on an analysis of each individual — especially from the behaviorist's point of view, considering the past life and career rather than the self-explanatory, subjective statements — it should be possible to influence the future conduct of these individuals. While their fundamental equipment cannot be changed any more than that of the other two groups, these people suffer more from the

effects of their conduct than from their subjective attitude towards themselves or their environment.

Thus, as Kraepelin points out, alcohol is an important factor in producing the final downfall. Extravagance, profligacy, sex excesses, venereal disease, bad companionship, and so forth, are the factors which combine to cause the social difficulties. The suggestibility of these individuals, their intelligence and insight, which is usually quite adequate for their needs, can be made use of in acquiring and strengthening the habits which the individual would never be able to gain if left to himself.

What is desired, therefore, is a system of mental and emotional exercises for the purpose of habit formation. This might be designated as *orthopsychics*. This term is further applicable in that a good many of those cases are instances not of disease in the sense of an acquired, deteriorating process, but rather comparable to physical deformities. For the present our experiences in orthopsychics is limited. We have had a few cases in which, after a preliminary survey at the Psychopathic Hospital, a course of training has been applied which has consisted above all in arousing the interests and appealing to the pleasure-loving side of the individual. It is a well-known fact, for instance, that in dealing with wayward young people, even under the most advantageous circumstances and even with the most favorable and friendly environment, the individuals do not do well. This appears to be due to the fact that the emotional impulses are of short duration, and leave no strong impression behind them. Therefore, when the novelty of a situation has worn off, there is nothing to hold the interests of the delinquent and tide him over the tedious days of monotonous routine.

We have proposed in a number of cases (and have carried it out to some extent in a few) to arrange to change the environment of each individual before the novelty has quite worn off. The length of time in which an individual stays in each home varies in each instance, and must be determined carefully each time. We are all so prejudiced by our early ethical training that it is difficult to be perfectly objective in dealing with these people. It is hard to eliminate pedagogic and purely academic demands for that which we consider right. None the less, this must be done, and in every instance, in every disagreement, at every change in the routine of the individual, emphasis must be laid on the fact that it is done from a medical point of view, that is, from a point of view of therapy and help, with kindly feelings

towards the patient, and never as a corrective or as a punishment, and above all, never vindictively.

This plan has succeeded in a number of non-institutional cases, which are rather better off than the institutional cases, because of the fact that the financial condition of these individuals permitted an adequate provision for their care. The State at present makes no allowance for this sort of therapy, and even experimental work, which is as yet hardly to be ventured, requires funds which are at present entirely lacking.

Education and training, therefore, rather than punishment are the methods that hold out a chance of success. These individuals are not able to learn by experience. They receive the equivalents of punishment in their daily life, which are sufficient to influence the formation of adequate resistance in a normal individual. In these individuals, while they often recognize the full significance of these circumstances in which their delinquencies placed them, their experiences have no corrective influence.

To punish such an individual, therefore, is to increase his defeat rather than to strengthen his defences. It is like administering alcohol to the patient suffering from delirium tremens. It is like injecting diphtheria toxin into the circulation of a patient suffering from diphtheria. We may draw a final analogy from immunology in applying this therapy.

The first duty is protection against the immediate effects of the acute attack. In our cases this means freeing them from their immediate difficulties, supplying them with food and lodging, helping them to recover from alcohol and drug intoxication, relieving their physical symptoms, curing them of venereal disease, and building up their physical health.

In the second place, immunization. This is often in the nature of after-care, and cannot be achieved at once, but can be accomplished by a building up of the defences — habits — by training,— not by overwhelming an already breaking organism with the hostile conditions, but by gradually strengthening their habits so that they will meet the particularly unfavorable conditions without fear of breakdown. In the group of the emotionally unstable this offers great hope. In the paranoid and defective groups, at least, a palliative effect may be hoped for.

At present the practice is to attend more or less thoroughly to the first of these requirements, that is, relieving the patient's immediate needs. When the after-effects have disappeared, and the patient once more seems normal, he is sent out into the

world, in most cases merely to repeat the offence that brought him under observation in the first place. Here, where treatment ordinarily leaves off, is where the special and most important part of the therapeutic effort should begin, and in this respect the penal institutions no less than the hospitals for psychopathic cases must assume responsibility.

REFERENCES.

1. Stier: "Wandertrieb und pathologisches Fortlaufen bei Kindern." 1913.
2. James: Psychology, Vol. 2, p. 446.
3. Journal of Mental Hygiene, Vol. I, No. 1, October, 1916.

DISSOCIATION OF PARENCHYMATOUS (NEURONIC) AND INTERSTITIAL (NEUROGLIA) CHANGES IN THE BRAINS OF CERTAIN PSYCHOPATHIC SUBJECTS, ESPECIALLY IN DEMENTIA PRÆCOX*

By E. E. Southard, M.D.

I brought before the Association in 1914 some considerations as to the analysis of cortical stigmata and focal lesions in certain psychoses.[1] I pointed out some promising paths of histopathological research in the cerebral cortex, illustrating my contentions from cases of a disease or diseases clinically known as dementia præcox. We are indebted to the cortex topographers — among whom we may name Bolton, Campbell, Brodmann, of the moderns — for the rich lines of research which now open out to the neuropathologist. It has become the duty of the neuropathologist in this new phase of cortex histology to study comparatively the tissues of the "arrival platforms" (sensory), and those of the "departure platforms" (motor), and of the intermediary and more recently evolved tissues of the so-called "elaborative" or "psychic" nature.

Perhaps the best modern description of the new views is to be found in Bolton's recent work on "*The Brain in Health and Disease*,"[2] with many of whose general contentions most neuropathologists would agree.

My own attention has been attracted by the technical advantages for differential histopathological analysis of cortical tissues of strikingly different architecture lying adjacent to one another. For example, the sensory arrival platform for vision, as represented by the calcarine type of occipital cortex, lies in close proximity to visual elaborative, or so-called "visuopsychic" tissue (to employ Bolton's term), namely, the common occipital type of cortex. These two tissues exist under virtually identical physicochemical conditions. I have found in certain cases a sharp histopathological differentiation in these tissues, which tissues not only exist ante mortem under identical conditions, but may be passed through a variety of technical procedures post

* Being M. C. M. D. Contribution No. 1916.22 (whole number 164). The previous contribution, 163 (1916.21), was by H. M. Adler, entitled "A Psychiatric Contribution to the Study of Delinquency," to appear in American Journal of Criminal Law and Criminology. Reprinted from the Transactions of the Association of American Physicians, 1916.

mortem of identical nature and terminating in material which can be comparatively examined under a single small cover-glass. One of the cases adduced in my former communication proved to show certain chronic changes in the elaborative or visuopsychic tissue, whereas the visual arrival platform or sensory tissue remained without obvious lesion. The case in question clinically showed pronounced and appropriate psychotic symptoms in the shape of certain sharply defined visual hallucinations; whereas the visual function in general was apparently quite normal. Such distinctive correlation between visual hallucinations and visuopsychic tissue lesion is almost (as one might say) too good to be true, and very possibly the hallucinations were really due to some functional involvement of these tissues quite apart from the obvious gliosis of the so-called visuopsychic tissue. The lesions, in fine, may merely be indicators of the true mechanism or chemism of the psychotic symptoms.

Turning attention in 1915 to the technical details of the task of the neuropathologist in the illustrations and interpretation of finer changes, I pointed out the advantages of a truly pathological classification of nerve cells.[8] It appeared that certain apparently homologous and at any rate analogous cell types had surprisingly different survival values. Thus, the large Betz cells, or so-called giant cells of the cerebral cortex, were found exceedingly resistant to certain types of tissue destruction, whereas those very kinds of destructive processes made short work of the large Purkinje cells, or giant cells of the cerebellar cortex. I am bound to say that further work may show that under some conditions the large cells of the cerebrum and of the cerebellum may live and die, as it were, together, and evince identical survival values under said conditions. With the material at hand, however, I felt sufficiently satisfied to propose a comparative study of the differential viability of the various nerve cell types.

I seemed to see as a construction of the future an essentially "pathological" classification of nerve cells on the basis of their powers of resistance or survival values. I thought that the neuropathologist might well proceed to collect data as to the differential effects of simplification or decomplication of nerve tissues. Are there not, however, cases always outstanding in which there are no such changes; psychoses in which, namely, the brain and especially the cerebral cortex is acting abnormally

but shows no structural sign of its abnormal action? Are there not, in short, cases in which the brain is theoretically and intrinsically entirely normal and merely acting abnormally under the stress of conditions exogenous to the nervous system? This is the problem of normal-looking brains in the psychoses, contributions to which have been made by several workers in Massachusetts institutions for some three or more years past.[4-8]

Are there cases in which, however carefully we shall study the elaborative tissues alongside the arrival and departure platforms, we shall not find lesions of importance? Are there cases in which the problem of the survival values of different types of nerve cells will not be at all in play? Is there anything in the neuropathological literature or elsewhere which goes definitely to prove that the clinical phase of a psychosis is identical with a phase of cell injury? Is it certain that the period when a patient shall seem mentally altered to a skilled observer is identical with a period in which coarse or fine anatomical methods shall demonstrate important structural lesions? Is there not, in short, a group of cases in which the solution of the psychotic problem is entirely removed from the zone of cortex histology, and even theoretically of cortex chemistry and physics, simply because the cortex is presumed to be working under quasi normal conditions? Is there not a problem of the psychoses which we may term the problem of "discords played on good instruments?" Unless some answer to this question can be given, the theory of the genesis of the psychoses is likely to be at loose ends.

Accordingly I felt it of strategic value in this work to study a group of normal-looking brains, to isolate if I could a number of convincing examples of *psychoses of definite and relatively permanent nature, in which cases pertinent lesions should be absent or negligible.* I had forthwith to disregard great numbers of brains with a number of lesions, not because I was entirely sure that these lesions were correlated with the psychoses, but because they clouded the issue of determining absolute normality for the brains. Even on the standards of the autopsy table, something like two-thirds of the brains that accrue from a hospital of committed types of mental disease exhibit more or less pronounced gross lesions, largely of an atrophic nature or of such a nature that the differential diagnosis between acquired atrophy and inborn hypoplasia cannot be made. If the neuropathologists at work are a bit structuralistic, then, as in our Danvers material,

about three-fourths of the brains turn out to be abnormal in some important way. The finer structural diagnosis yields in this event still more cases of an atrophic or hypoplastic nature, and tends to exhibit a remarkable preponderance of such conditions in the frontal lobes. In fact, the frontal lobes in the hands of some observers are found atrophic or hypoplastic in greater or less degree in two-thirds of relatively long series of brains.

In several years' work I developed certain criteria of the normality of the brain which may be in part within the personal equation, but which, applied to a Boston State Hospital series (in the hands of my colleague, Dr. M. M. Canavan), left only one-eighth of all the brains of a series of 145 subjects without gross lesions of apparent significance, or of such a nature that it would be dangerous to say that the lesions were without relation to the psychoses. Whether cystic, atrophic, hypoplastic or otherwise characterized, the lesions in seven-eighths of the Boston series were too perturbing to deal with in the problem of "discords played on a good instrument."

Nineteen of the 145 brains studied at the Boston State Hospital in the years 1910 to 1913 by Dr. M. M. Canavan and the writer turned out to be of a normal appearance in the gross (11.7 per cent.). These 19 cases were especially studied as to their clinical histories. Their previous histories and hereditary features were particularly looked into by a trained worker in eugenics (namely, Miss Anna E. Steffen) who went into the field after new data to correlate with the cases viewed in their entirety. Moreover, all the brains were systematically photographed by Mr. Herbert W. Taylor under the supervision of Dr. Annie E. Taft, both before and after the removal of the pia mater, so that the upper, lower, lateral and mesial aspects of each brain could be readily compared side by side.

Orienting microscopic examination was then made of a few areas in each of the 19 cases. One of the cases, for example, turned out to be microscopically a case of general paresis; another was very probably a case of the co-called central neuritis, with a variety of additional microscopic changes. Still another case showed striking universalized cell changes, also of an acute nature. Other cases showed convincing degrees of diffuse cell loss or of diffuse arteriosclerotic change of such a nature that one could hardly understand the alleged normality of the brains as observed at the autopsy table. A few of the cases were of brief

duration and clinically of such a nature that it might be doubted whether they would upon survival have turned into cases of chronic mental disease. The clinical histories of some cases indicated such brief illness that it might well be doubted whether the brains would register gross atrophic changes in the time available.

However, in the course of the successive application of higher and higher powers (as it were) of logical analysis, we arrived at a set of five cases, which cases were all clinically of a sufficient duration to warrant the idea of relatively permanent mental change, had all been observed with adequate accuracy, could be fitted sufficiently well into prevalent classifications of mental disease, and *still failed to show, either at the autopsy or in the systematic photographic analysis of the cortical appearances, or even in the orienting microscopic examination of a number of areas, any convincing evidence of brain disease.* It is not that the microscopic examination failed to show changes, and possibly changes of some importance (as will be mentioned below); but the microscopic changes found in the orienting analysis of these five brains were, after all, hardly striking enough to warrant correlation with the symptoms observed or the entities determined.

It seemed that these five cases, the product of successively more intensive analysis of a large series, might permit us to draw the lines a bit closer about the classical position of the psychiatrists as to generally functional psychoses. In any event, the classical position of various psychiatrists as to the functional psychoses is often based upon the vaguest of formulæ, perhaps even in some cases on the private ontological wish of some one that mechanistic or vitalistic views of mental disease shall prevail. It is clearly our duty in this situation to discover what the facts are about the very existence of these genuinely functional psychoses, the psychoses that proceed with utter intrinsic normality of the brains which are running along just as a physiologist might wish them to run.

I am far from holding that the observation of numerous minor lesions in a variety of loci in all of the brains in question proves that no brain in a psychopathic subject is structurally normal. No one could be so naïve as to suppose that association or correlation of lesions and symptoms amounts to a causal nexus between the lesions and symptoms. Still, I am bound to say

that the functionalist wishing to prove that mental disease is consistent with a structurally normal cortex must find himself greatly at a loss when confronting the present material. Even with all due allowance for the personal equation in histological analysis (and only histologists are aware how wide is this margin), the changes found, varying as they do from brain to brain and from locus to locus within a given brain, must certainly be given due consideration. I conceive that no brains of normal non-psychotic subjects have so far been examined with equal thoroughness.

Without insisting upon gaining a decision in the struggle over intrinsically normal brains in the psychoses, and conceding the necessity of more material than here presented, I wish to offer some interesting considerations that came rather as a by-product of this work. These considerations I had intended to indicate in the title of this communication. The dissociation of parenchymatous and interstitial lesions, set forth in my title, will remind the pathologist of the older contentions concerning diseases, *e.g.*, of the kidney. Such, for example, is Senator's classification of chronic forms of kidney disease. In point of fact, the cases of brain disease here studied do rather clearly show a tendency to pure parenchymatous disease on the one hand, to pure interstitial disease on the other hand, and to a mixture, or "diffuse" condition in one case. Of course, when it comes to kidney disease, the pathologist has often felt it a merely pious wish that chronic Bright's disease shall fall at all easily into parenchymatous and interstitial forms. Nor do I feel that the cerebral cortex or congeries of organs, still more labile than the kidney, is likely to permit a similar classification to click easily into place.

We must clearly consider that the scar stage of cortex diseases will complicate any picture. Equally when Volhard and Fahr, in their well-known monograph on Bright's disease, attempt to separate the nephroses from the nephritides, they are compelled to find scar stages in both types.[9]

The peculiar advantage for our present purpose of these five cases is that our study has proved them to be not yet in a scar stage, if indeed they were ever destined to become visibly and tangibly atrophic. Here are cases which have proceeded for a number of years without evidence of naked-eye change and without palpable changes to the finger. Microscopically, however, they prove to be in some instances the polar extremes of

one another; a case with highly marked degenerative cell changes proves to show entirely negligible neurogliar changes. Another case with extremely marked neurogliar changes (though without induration in the gross) proves to have little or no parenchymatous change in the shape of cell degeneration.

Let us look more in detail at these changes. The following is a list of cases having brains normal looking in the gross, both as observed upon the autopsy table and after photographic analysis, and yet microscopically normal or with negligible or minor changes in eight orienting areas of the cerebral cortex.

Case.	Sex.	Age.	Onset.	Duration.	Diagnosis.
11.36, . . .	F.	31	29	20 months, . .	Manic-depressive.
12.47, . . .	F.	27	25	2 years, . .	Dementia præcox.
13.7, ...	F.	64	20	3½ years, . .	Manic-depressive.
12.41, . . .	F.	60	50	10 years, . .	Paranoia.
10.9, ...	F.	56	42	14 years, . .	Dementia præcox.

The microscopic examinations were, although extensive, limited to observations of material prepared in two classical ways, namely, by a monochromatic nuclear stain demonstrating cell nuclei and cell bodies with sufficient clearness, and by the Weigert myelin sheath method. Notes were made of appearances in the following areas on each side: prefrontal, superior frontal, precentral, postcentral (taken superiorly), postcentral (taken inferiorly), superior parietal, angular, Broca, transverse temporal, superior temporal, middle temporal, insular, gyrus rectus, pyriformis, calcarine, making 16 areas on each side, or 32 areas in all. Owing to technical difficulties, occasional areas could not be completely studied and were omitted.

Notes were made as to the appearances, as a rule, in seven zones of the cortex and in the underlying white matter. The resulting tabulations included 144 to 232 histological observations upon nerve cells, neuroglia cells, satellite cells, axonal reactions, chromatolysis, pigmentation, arterial changes, etc., in separate loci defined by area and layer. An endeavor was made to include among nerve cell changes, besides axonal reaction and pigmentation, also the somewhat more difficult diagnostic points of cell swelling, cell shrinkage, diffuse staining, deep

staining, pale staining, and the like, some of which changes are, of course, difficult of interpretation, and are even within the range of the personal equation.

The following table shows the proportion of lesions noted in the loci observed in these five cases.

Case.	Diagnosis.	Duration.	Loci examined.	Lesions noted.	Ratio of Lesions to Foci.
11.36, . . .	Manic-depressive, .	20 months, . .	152	111	73
12.47, . . .	Dementia præcox, .	2 years, . .	232	193	83
13.7, . . .	Manic-depressive, .	3½ years, . .	144	121	84
12.41, . . .	Paranoia, . . .	10 years, . .	208	149	71
10.9, . . .	Dementia præcox, .	14 years, . .	224	122	54

It is clear that these co-called *lesions* are of various nature and of very varying significance to the psychoses in question. Accordingly, a collation of the lesions noted has been made to show the proportion of what we regard as nerve-cell losses and of what we regard as proliferative changes. We freely grant the difficulty of a diagnosis of nerve-cell losses upon qualitative grounds and without adequate measurement and possible photography. However, we present our analysis for what it is worth: —

Case.	Diagnosis.	Duration.	Loci observed.	Nerve-cell Losses diagnosticated.	Ratio of Supposed Nerve-cell Losses.	Evidences of Neurogliar Proliferation observed.	Ratio of Proliferative Changes.
11.36	Manic-depressive, .	20 months,	152	66	43	12	7
12.47	Dementia præcox, .	2 years,	232	123	53	7	3
13.7	Manic-depressive, .	3½ years,	144	33	22	55	38
12.41	Paranoia, . .	10 years,	208	91	43	24	11
10.9	Dementia præcox, .	14 years,	224	25	11	19	8

With all due concession of the difficulty of making a qualitative estimate of nerve-cell loss, it is entirely clear that these cases tremendously differ among themselves in the matter of nerve-cell loss as we render the diagnosis. Compare for example the

11 per cent. of nerve-cell losses in Case 10.9 with the 53 per cent. of loss noted in the various loci of Case 12.47. Almost any histopathologist would readily agree that it is far easier to make a diagnosis of neurogliar proliferative changes than of nerve-cell losses on account of the fact that in cellular gliosis we deal with positive added factors in the shape of clearly observable nucleated cells. It is clear from the great disparity in percentages of proliferation as compared to cell losses either that gliosis does not run *pari passu* with nerve-cell losses or that our diagnosis of nerve-cell losses errs in the direction of finding too many losses. However, just as in the case of the nerve-cell losses, so also in the case of the neurogliar proliferative changes, we find a great range of differences; thus in Case 12.47, we find but 3 per cent. of proliferative changes, whereas in Case 13.7 we find 38 per cent. Without closer analysis it is clear that Case 12.47, having the highest percentage of nerve-cell losses (53), is precisely the case which has the lowest percentage of proliferative neurogliar changes (3). It is clear that Case 11.36 and Case 12.41 tend in the same direction, since Case 11.36 shows 43 per cent. cell losses to 7 per cent. neurogliar proliferative changes, and 12.41 shows 43 per cent. of nerve-cell losses, but 11 per cent. of neurogliar changes. On the other hand, Case 13.7 shows the opposite tendency, for it contains the highest percentage of neurogliar proliferative changes, namely, 38, and next to the lowest percentage of nerve-cell losses, namely, 22. Conditions in these two directions of nerve-cell loss and neurogliar proliferation are numerically about even in the fifth case, namely, 10.9.

A number of tentative conclusions might be drawn from these cases, but it is worth while to analyze the findings more in detail and to examine the clinical histories before rendering these conclusions. First, let us present in tabular form some details of the microscopic findings in these cases. The columns deal with the white matter, the undermost or fusiform layer of the cortex and then in succession the layers of internal large pyramids, stellate cells, external large pyramids, medium pyramids, small pyramids and the plexiform layer. The findings in regions like the occipital which do not entirely agree in general construction and nomenclature with the other areas of the cortex have had their findings listed under the headings of those areas which are most nearly homologous with the areas just listed.

The abbreviations in the columns are as follows: —

axre = axonal reaction.
artscl = arteriosclerosis.
cegl = cellular gliosis.
chrly = chromatolysis.
irreg = irregular grouping of cells.
l = loss.
perigli = perivascular gliosis.
perivdep = perivascular cell deposit.
pig = pigmentation.
sacpig = saccular pigmentation.
satc = satellite cells.
shr = cell shrinkage.
sm = small cells.
vth = vessels thick.

I hope to publish elsewhere the details of the clinical, anatomical, and histological examinations of these five cases, but for the present purpose I will mention only a few of those features which seem particularly pertinent to the question of the dissociation of parenchymatous and interstitial lesions.

	White Matter.	Fusiform.	Internal Large Pyramid.	Stellate.	External Large Pyramid.	Medium Pyramid.	Small Pyramid.	Plexiform.
11.36 Manic-depressive, 20 months,	3 perivdep 1 perivgli 5 vth	1 axre 2 satc 10 l 1 irreg	3 axre 1 chrly 1 satc 1 shr 12 l	1 satc 1 shr 10 l 3 irreg	4 axre 2 satc 1 shr 10 l	1 axre 2 cegl 1 satc 1 pig 1 shr 13 l	2 cegl 11 l 3 shr 1 vth 1 irreg	0
	9	14	18	15	17	20	18	=111
12.47 Dementia præcox, 2 years,	12 artscl 1 l 1 vth	13 axre 1 satc 15 l 1 sacpig	3 axre 2 chrly 1 sacpig 1 irreg 3 shr 2 satc 17 l	4 axre 1 shr 23 l	5 axre 1 chrly 4 shr 18 l 1 sm	1 axre 1 irreg 4 shr 24 l 1 sm	1 cegl 25 l 2 shr 1 sm	3 cegl
	14	30	29	28	29	31	29	3=193
13.7 Manic-depressive, 3½ years,	3 pig 1 perigli 1 cegl 6 vth	5 satc 3 shr 2 pig 7 l 3 cegl	4 satc 2 axre 6 pig 5 l 1 shr	2 satc 1 cegl	1 axre 8 satc 5 pig 2 cegl	11 l 3 satc 5 cegl 2 shr 1 irreg	10 c 4 cegl	17 cegl
	11	20	18	3	16	22	14	17=121
12.41 Paranoia, 10 years,	2 perivdep 8 artscl 1 pig 2 l	1 axre 1 cegl 8 satc 3 shr 2 sm 16 l	6 axre 3 shr 1 sm 14 l	3 axre 3 satc 15 l	1 sm 2 shr 14 l 2 axre 3 satc	4 axre 1 satc 1 shr 15 l	4 cegl 3 shr 15 l 1 satc	3 cegl 1 vth
	13	31	24	21	22	21	23	4=159
10.9 Dementia præcox, 2 years,	6 pig 9 vth 3 perivgli	5 axre 9 satc 2 shr 2 irreg 3 pig 2 l	4 axre 3 pig 10 l 1 irreg 3 shr	4 axre 2 satc 1 vth 3 irreg 3 l	7 shr 3 satc 4 irreg 3 l 2 pig	4 axre 1 pig 4 satc 2 irreg 3 l	5 axre 1 irreg 1 shr 4 l 1 vth	1 vth 1 pig
	18	23	21	13	19	14	12	2=122

Let us consider, first, Case 12.47, that case in which the parenchymatous change was maximal and gliosis minimal. The cell lesions in this case were observed in 53 per cent. of all loci examined. Gliosis appeared in but 3 per cent. of all loci examined; that is, 123 examples of cell loss were noted in 232 loci; whereas but 7 instances of neuroglial proliferation were observed in these same loci. This case was one of dementia præcox and was the youngest of these cases: an Irish servant girl, with some drunkenness and tuberculosis in the family, herself a victim of tuberculosis, and in point of fact developing symptoms after discharge from a sanatorium for tuberculosis; a case with two years of mental symptoms, dying at the age of twenty-seven years. The autopsy showed sclerosis of the aorta and of the splenic artery; the heart muscle showed brown pigmentation, and the vascular vessels were small. Even the brain was not destitute of minor arteriosclerotic changes, more marked than in any other case of this particular series of five. A bird's-eye view of the lesions would, in point of fact, suggest a greater age than the patient actually had reached. At first, apprehensive, depressed, slightly slow in reactions, the patient after some weeks became apathetic and unwilling to take food, became mute or whimpering, and finally completely non-co-operative, sitting for long periods in a particular attitude, and showing a characteristic and marked flexibilitas cerea. From this condition she fell into a sort of catatonic stupor, from which she emerged some weeks later in a euphoric state, able to feed herself and with a good appetite, but with loss of memory for recent and remote events and disorientation. Some months later, after headaches and dizziness and a fainting spell, the patient took to bed in what seemed to be a catatonic stupor, from which, however, she once rose and moved about.

If there is such a disease as dementia præcox, it is probable that this case must be counted therein. Two years is probably a safe period in which to allow the development of atrophy, or at all events of a certain induration of the brain, provided that there were any tendency on the part of the tissues to gliosis. In but 7 loci out of the 232 examined was there any evidence of gliosis, and these evidences were for the most part examples of cellular gliosis in the outmost layers — a locus of election for such changes in a variety of diseases. Are we not here dealing with a comparatively pure example of mild but exceedingly widespread parenchymatous changes without tendency to

neurogliar reaction? It is, of course, hard to believe that this case, had it lasted twenty instead of two years after onset, would fail to have shown far more gliosis. Just as the so-called nephrosis of Volhard and Fahr may pass into a scar stage of secondary nature, so we may suppose that the brain tissues of Case 12.47 — a case with maximal evidence of cell loss — might well pass into a stage of corresponding interstitial loss. I pass over comments concerning the correlation of particular symptoms with the distribution of lesions in particular loci, as without the scope of this paper.

Let us now throw into contrast with Case 12.47 that case (13.7) which showed the maximum degree of neurogliar change (38 per cent. of loci examined) and far less evidence of cell loss (22 per cent. of loci examined). This is a case, aged sixty-four years at death, diagnosticated manic-depressive psychosis of a total duration of three and a half years, occuring in two attacks: one, an attack of so-called slight melancholia, a year in duration, beginning at twenty years of age; and the other before her death. The family, in this case, showed a number of instances of cardiovascular disease, and the abdominal aorta of the patient herself was found altered into a calcareous tube, with ulcers, vegetations and a thrombus. In the head, the patient showed basilar arteriosclerosis; but the brain tissues so far as examined showed little or no evidence of fine arterial changes. In fact, the high percentage of gliosis cannot be related to vascular change with any probability. The gliosis is pretty generally distributed throughout the loci; many instances of cellular gliosis are found in the outermost layers, but satellitosis is especially marked in the inner layers, associated with more or less cellular gliosis. It is easy to claim that the gliosis is a phenomenon of age, and such it may actually be. The ordinary hypothesis for its production would be the loss of cells with the endeavor on the part of the neurogliar tissue to replace these cells. Bearing in mind that the brain was of normal appearance and weight (was, in fact, something like 200 grams overweight in relation to the body length, 1,370 grams), we are confronted by the fact that the evidence of cell loss in the cortex is slight. If we are to suppose that the long lucid interval of decades between the attack in the twenties and the patient's death in the sixties ran on without special evidence of cell loss, and regard the mental disease as in nowise due to structural cell changes, then, perhaps, we may think of a progressive, slight but widespread, gliosis going on without special relation to the symptoms of the case.

If we omit reference to the gliosis altogether, and compare this case (13.7) with the above-mentioned case (12.47), we perceive that a patient, aged sixty-four years, with three years and a half of symptoms, two years and a half immediately preceding death, exhibits but 22 per cent. of cell losses in loci examination as compared with 53 per cent. in a patient dying at twenty-seven years after two years of symptoms. On the basis of parenchymatous change alone, accordingly, this oldish case of manic-depressive psychosis (13.7) is better off in nerve-cell content than a far younger case of dementia præcox. Yet in both instances the play of lesions in the parenchyma has gone on without a proportionate amount of neurogliar change. The severely affected parenchymatous case (12.47) has little or no gliosis, and the far less severely affected parenchyma of Case 13.7 is supplied with a gliosis which we may possibly attribute in part to the mysterious operations of senescence.

A third case (11.36) is another case of comparatively brief duration, some twenty months or two years, with death at thirty-one. This case should be worth comparing with 12.47, having two years of symptoms with death at twenty-seven. This case shows somewhat less parenchymatous change: 43 per cent. in the loci examined, and somewhat more neurogliar change: 7 per cent. of loci examined. The first fact which attracts us in this case is the diagnosis: manic-depressive psychosis. This diagnosis was grounded upon the obvious mania of the patient on admission. Nevertheless, the patient herself described auditory hallucinations — a symptom of somewhat ominous character, and not often found in clearly defined form in good examples of manic-depressive psychosis. Again, the patient executed a variety of impulsive acts and showed stolidity and indifference in certain phases, together with persistent slight silliness, which may well be regarded as consistent with the diagnosis of dementia præcox. The fact that the patient also showed symptoms characteristic of manic-depressive psychosis is not at all inconsistent with the theory of these diseases, since virtually every symptom of manic-depressive psychosis is nothing but an exaggerated or lessened degree of a normal phenomenon. Hence, as we currently say, dementia præcox patients as well as all other mental patients may show manic-depressive symptoms; whereas the true manic-depressive patient fails to show anything but normal phenomena in abnormal degree. It would be hardly convincing to alter the diagnosis of manic-depressive psychosis to dementia præcox in the light of cortex histology in the present

dubious phase of this topic. I am inclined to feel, however, on the clinical data alone, that the case is one of dementia præcox and that we would best align Case 11.36 with Case 12.47 as cases developing a variety of dementia præcox symptoms in the twenties and both succumbing to tuberculosis. Both showed cardiovascular tendencies; both were servant maids; both had a certain family taint,— drunkenness and tuberculosis in one; neurosis, heart disease, diabetes and tuberculosis in the other. Of course we may give ourselves leave to inquire whether the tuberculosis in these cases has a genetic relation to the mental disease or possibly to the parenchymatous changes in the brain. At all events there is something peculiar and interesting in these cell losses which are not accompanied by gliosis.

Another case (12.41) has as high a proportion (43 per cent.) of parenchymatous changes as did Case 11.36, although it possesses a slightly higher ratio of neurogliar changes (11 per cent.). Here is a case with symptoms of ten years' duration, with death at the age of sixty years. If it was easy to ascribe to old age the 38 per cent. neurogliar changes in Case 13.7, a woman dying at sixty-four years, it is remarkable that senescence has produced few neurogliar changes in Case 12.41. Moreover, in Case 12.41, a great many of the neurogliar changes are of the nature of satellitosis, changes, namely, which are rather more related with cell loss than with any senescent tendency to a general induration of the tissues. The diagnosis in this case is not too easy, although a delusional condition was paramount and the diagnosis paranoia or paraphrenia (in the newer Kraepelinian sense of this term) may be regarded as safe. The patient's father was dissolute and she early had illegitimate children, but thereafter her progress was upward, and upon refusal of her paramour to marry her, she left him and became active in church work, and in the course of years began to present an appearance of refinement. In the fifties, however, she became mildly deluded about her pastor, circulating stories of misconduct and talking of his influence upon her. After threats on his life, she was committed. She held the belief that the pastor had hypnotized her and had caused many deaths in his church.

This case, like Case 12.47 and 11.36, was also extensively tuberculous, having developed tuberculosis late in life.

Here, then, are three cases: Case 12.47, Case 11.36, and Case 12.41, aged at death twenty-seven, thirty-one, and sixty years, respectively, with tendency to marked parenchymatous change associated with but slight neurogliar changes, all three belonging

very possibly to the group of endogenous deteriorations in the sense of Kraepelin; the first undoubtedly a victim of dementia præcox, the second very probably so, and the third an early sex delinquent, later hyperreligious, becoming paraphrenic or paranoiac. When contrasting these three cases with a case pretty certainly not one of the so-called endogenous deteriorations, namely, Case 13.7, a case which showed two phases of manic-depressive psychosis, we have thrown into strong contrast the parenchymatous changes of our three "endogenous" cases and the lesser development of cell losses in the manic-depressive psychosis.

There remains for consideration one case — the most nearly normal case of our whole series — a case dying at fifty-six years of age, after fourteen years of frank symptoms, which received the diagnosis of dementia præcox. This patient was of noble French extraction, and had a high-school education. She gradually developed from an apparently genuine jealousy a wealth of paranoid ideas about her family and acquaintances. She was given to extravagant accounts of her delusions, and went at times out of the hospital ward dressed in brilliant colors, youthfully, and with ribbons in her hair, and wore a lace coat of peculiar pattern. She was for years a striking patient, decorating herself with buttons, arranging her hair in small curls, and talking continuously and fantastically. She later developed auditory hallucinations and a number of hypochondriacal ideas. The cell losses in this case came to but 11 per cent., and the gliosis to but 8 per cent. Accordingly, if our method of judging lesions is correct, this case is the most nearly normal case in the series. There are some interesting points which may be published later concerning the distribution of lesions in different loci in these cases. From the present point of view, I wish to call attention merely to the distinction of this case from the other cases which we should perhaps term also cases of endogenous deterioration. I may call attention to the absence of active tuberculosis from this case.

Thus, in our whole series, the youngest patient (Case 12.47) showed the most instances of cell loss and the least instances of neurogliar proliferation. On the other hand, the greatest number of instances of neurogliar proliferation occurred in the oldest patient (Case 13.7). Age alone, however, can scarcely account for the gliosis in Case 13.7, since another patient almost as old (Case 12.41) showed very little gliosis. The neurogliar changes are very possibly dissociated from the parenchymal changes.

If we turn from neurogliar changes to nerve-cell changes we find that a case of manic-depressive psychosis (Case 13.7), although sixty-four years of age and the victim of a variety of somatic diseases, showed far less cell loss than 3 cases (Cases 12.47, 11.36, and 12.41) apparently belonging to the group of so-called endogenous deteriorations. We might at first sight suppose that the cases of endogenous deterioration are more prone to parenchymatous changes than to neurogliar changes. This may well be the case, but we must remember that these three cases also happen to be victims of severe tuberculosis. Moreover, we have another case (Case 10.9) and that the case of longest duration in the whole series (fourteen years), which not only showed a low percentage of neurogliar changes but a low, and, in fact, the lowest percentage of parenchymatous changes. This most nearly normal case in our series was not actively tuberculous. It was most probably a case of endogenous deterioration. The changes in this case were singularly localized in certain regions, so that if the process exhibited in some loci were spread over the entire nervous system, the case would undoubtedly resemble the others of the endogenous series.

I cannot enter here the unsolved question of the relation of tuberculosis to dementia præcox and the possibility of lytic changes somehow incidental to tuberculosis taking place in the nervous system. I am limiting the argument to the question of the dissociation of parenchymatous and interstitial changes.

We have thus considered: —

1. The case with most instances of cell loss (Case 12.47).
2. The case with least instances of cell loss (Case 10.9).
3. The case with the most instances of gliosis (Case 13.7).
4. The case with the least instances of gliosis (Case 12.47).

And we have learned that there may be a marked lack of correlation between cell loss and glia proliferation (see especially Case 12.47).

The two remaining cases (Cases 11.36 and 12.41) resemble each other in both proportions (43 per cent. to 7 per cent., and 43 per cent. to 11 per cent.).

Three of the cases with large degrees of cell loss had no corresponding gliosis. These were cases probably belonging in the dementia præcox group. They were all three very actively tuberculous.

The most nearly normal case of all was one that may perhaps be called paranoia. There was no active tuberculosis in this case.

The lesions were exceedingly focal, though of the same general appearance (cell losses in a variety of loci) as those of the more widespread parenchymatous lesions.

To sum up: —

1. Parenchymatous (neuronic) lesions and interstitial (neuroglia) lesions may be dissociated and combined, much as similar lesions in the kidney.

2. A case of manic-depressive psychosis failed to show convincing degrees of parenchymatous lesions.

3. Dementia præcox cases had marked parenchymatous disorder, to which gliosis was not at all proportionate.

4. It is necessary to find and study by like methods a good group of non-tuberculous cases of dementia præcox, so as to exclude tuberculosis from having a share in the production of these lesions.

REFERENCES.

1. SOUTHARD: "On the Direction of Research as to the Analysis of Cortical Stigmata and Focal Lesions in Certain Psychoses." Transactions of the Association of American Physicians, 1914, Vol. XXIX.
2. BOLTON: "The Brain in Health and Disease." London, 1914.
3. SOUTHARD: "Advantages of a Pathological Classification of Nerve Cells, with Remarks on Tissue Decomplication as shown in the Cerebral and Cerebellar Cortex." Transactions of the Association of American Physicians, 1915, Vol. XXX.
4. MCGAFFIN: "A Study of the Forms of Mental Disease showing no Gross Lesions in the Brain at Autopsy." American Journal of Insanity, 1912, Vol. LXIX.
5. SOUTHARD: "A Series of Normal-looking Brains in Psychopathic Subjects." American Journal of Insanity, April, 1913, Vol. LXIX, pp. 689–704.
6. SOUTHARD and CANAVAN: "Normal-looking Brains in Psychopathic Subjects. Second Note (Westborough State Hospital Material)." Journal of Nervous and Mental Diseases, December, 1914, No. 12, Vol. XLI, pp. 775–782.
7. SOUTHARD and CANAVAN: "A Study of Normal-looking Brains in Psychopathic Subjects: Third Note (Boston State Hospital Material)." Boston Medical and Surgical Journal, Jan. 28, 1915, No. 4, Vol. CLXXII, pp. 124–131.
8. SOUTHARD: "A Comparison of the Mental Symptoms Found in Cases of General Paresis with and without Coarse Brain Atrophy." Boston Medical and Surgical Journal, March, 1916, No. 3, Vol. XLIII, pp. 204–216.
9. VOLHARD and FAHR: "Die Brightsche Nierenkrankheit." Klinik, Pathologie und Atlas, Berlin, 1914.

NOTES ON GOLD SOL DIAGNOSTIC WORK IN NEUROSYPHILIS (PSYCHOPATHIC HOSPITAL, BOSTON).*

By H. C. Solomon, M.D.,

INVESTIGATOR IN BRAIN SYPHILIS, MASSACHUSETTS COMMISSION ON MENTAL DISEASES,

AND

E. E. Southard, M.D.,

PATHOLOGIST, MASSACHUSETTS COMMISSION ON MENTAL DISEASES, BOSTON, MASS.

After preliminary trials of the gold sol test of Lange upon cerebrospinal fluids, which had proved to us [1] as to other workers its remarkable reliability for routine work, endeavor was made to apply the method to cerebrospinal fluid obtained post mortem. Fortunately for the purpose of anatomo-clinical correlation it was proved that post-mortem fluids were quite capable of yielding important and valuable results.[2] A third step in this work consisted in the bringing of proof that the gold sol test would vary in different loci of the cerebrospinal fluid system.[3]

After this initial study of 28 autopsied cases, further work was done by way of routine in 25 cases of all sorts of mental disease as these came to autopsy in the State-wide service of the Massachusetts Commission. Variations of the test in different loci were again characteristically found, and an endeavor has been made by us in association with Dr. Canavan to determine the significance of these variations when compared with the histology of the underlying tissues. This latter work, not yet published in detail, yielded some conclusions of interest.

We deal with gold sol curves that have received the designations "paretic," "syphilitic," "chronic inflammation" (including tuberculous meningitis, brain tumor, etc.) and "acute" (including sepsis). These designations have been applied on a basis of clinical experience with fluids withdrawn by lumbar puncture without any very extensive collection of post-mortem verifications. In our recent series of 25 cases with histological parallels (that is, a study of the tissues underlying the point of the pia mater from which the fluid was withdrawn) there were but two

* Being M. C. M. D. Contribution No. 1916.23 (whole number 1657). The previous contribution was by E. E. Southard, entitled "On the Dissociation of Parenchymatous (Neuronic) and Interstitial (Neuroglia) Changes in the Brains of Certain Psychopathic Subjects, especially in Dementia Præcox." Transactions of Association of American Physicians, 1916. Read at the forty-second annual meeting of the American Neurological Association, May 8, 9 and 10, 1916.

cases in which the gold sol curve was characteristically paretic. One of these cases was characteristic of paresis histologically. It was interesting that, whereas the cerebral fluids yielded a "paretic" reaction, the spinal fluid yielded a "syphilitic" reaction, and the only factor presented in the cerebrum not in the spinal cord was a parenchymal change. There was a meningitis with plasmocytosis, both over the cerebrum and over the spinal cord, but the cerebrum showed characteristic intracortical perivasculitis, whereas the spinal cord showed little or no parenchymal change.

Another case which yielded a "paretic" reaction in the post-mortem fluid does not appear to be a case of paresis at all, if we are to make the diagnosis on plasmocytosis and other features. These features were all absent in this presenile dement, who died at 80 years. Now, in this case there was a cerebral hemorrhage and there were pial petechiæ. Of course we took the precaution of excluding from consideration all test fluids containing any tinge of blood, just as we habitually exclude such bloody fluids from examination when they are withdrawn in ordinary ante-mortem puncture. The fluids which yielded the paretic reaction from this case were *not* bloody when withdrawn. Is it possible, however, that hemorrhage and petechial processes will serve to nullify the value of the gold sol test even when there is no gross blood evident in the fluids? We are inclined to question the value of the positive gold sol test in fluids withdrawn for the purposes of clinical diagnosis when there has been a previous apoplexy or other hemorrhagic process, and if the Wassermann reaction is also negative. Of course, no one nowadays would attach extreme significance to a positive gold sol test if no other of the five tests now ordinarily used (Wassermann serum, Wassermann fluid, albumen, globulin, cell count) were positive. But this work seems to suggest that occult blood in cerebrospinal fluid may modify the gold sol reaction.

We had eight cases with "syphilitic" gold sol reactions. Not all of these cases showed mononucleosis of the meninges upon histological examination. One of the cases — an old asylum case of chronic dementia, whose proper classification is in doubt, dying at sixty years — had a process of cerebrospinal atrophy and sclerosis of moderate degree, and an appearance of combined system disease in the cervical spinal cord. But this case again was one of an old intercranial hemorrhagic process — in this instance an old internal hemorrhagic pachymeningitis. Possibly

occult blood or the remains of hemorrhage may have altered the gold sol reaction so that the results should be thrown out. Another case with syphilitic gold sol reaction, but without meningeal mononucleosis, did show a strongly localized meningitis about the third nerves, which suggested that special study should be made to reveal other microscopic evidences of focal change. On the whole, we question whether one should attempt to parallel the gold sol results with mononucleosis. The gold sol reaction indicates one sort of physicochemical situation in the cerebrospinal fluid; the lymphocytosis or plasmocytosis indicates another type of reaction on the part of the nervous system. There is no genuine need for discovering an exact parallel, or any parallel whatever, between the gold sol reaction and mononucleosis. On the whole, we do find far more of a correlation between cerebral or spinal atrophy and sclerosis, on the one hand, and the gold sol reaction on the other, than we do between mononucleosis and the gold sol reaction. We consider, accordingly, that the gold sol reaction is probably based upon the appearance in the fluid of substances produced in the process of atrophy and sclerosis. Mononucleosis of the fluid is perhaps a spill-over from mononucleosis about the blood vessels, while primary mononucleosis is a reaction of a chemiotactic nature. What little is known concerning the chemistry of the gold sol reaction (see, for example, the work of P. G. Weston[4]) may be regarded as consistent with our view of the relation of this process to the process of atrophy and sclerosis of the parenchyma.

It is sometimes inquired whether non-nervous syphilis can yield the "syphilitic" gold sol reaction of the spinal fluid. One of our cases we hoped could be used in this connection. The case was one of extensive gummata of the liver and yielded a "syphilitic" gold sol reaction of the cerebrospinal fluid. However, upon histological examination we proved the existence of a mild but distinct meningoencephalitis.

One case was particularly interesting since the clinical diagnosis of general paresis had been regarded as certain on the basis of somewhat elaborate clinical work, and since the lumbar puncture fluid in life, from time to time, yielded characteristic "paretic" reactions. However, at autopsy the fluids withdrawn from various parts of the nervous system failed to yield a "paretic" reaction. Some of the fruits did exhibit a characteristic "syphilitic" reaction. The autopsy showed exceedingly little brain atrophy and even less sclerosis, and there were no gross men-

ingeal changes except over the cerebellum and about the olfactory bulbs. Histologically, there were intracortical vascular infiltrations with mononuclear cells, and there were deposits of mononuclear cells in the spinal meninges. There were no cell deposits over the surface of the cerebrum. The histological diagnoses have to be summed up as chronic encephalitis and spinal meningitis,— a combination of lesions which topographically at least suggests that distribution of lesions which we get in a full-blown case of so-called paresis. This case had been extensively treated by salvarsan. A question arises whether the cortical paretic process occasionally retreats into a process which is syphilitic in some simpler sense of the term. It has, in fact, been the endeavor of the laboratory to show that a "syphilitic" gold sol reaction is in some sense a *forme fruste* of the "paretic" reaction.[5] If this be the case, then it may well be that at times the tissues produce a substance for a given period that allows the "paretic" reaction to develop, whereas before and after this period the tissues are producing a substance that allows merely the "syphilitic" gold sol reaction to be produced.

We had one case that showed in places a "syphilitic" gold sol reaction in the post-mortem fluid that never was regarded in life as paretic or even syphilitic. The case was, in fact, one of Korsakow's psychosis, dying of miliary tuberculosis. There was a focal intravascular polynucleosis in the spinal cord, and it may be that hemorrhages in connection with the miliary tuberculosis in some way interfered with the values of the gold sol reaction.

Summing up the situation with respect to the "syphilitic" reactions we found eleven cases. We felt entitled to remove from the denominator three cases of ante-mortem hemorrhage, since although the fluids tested showed no gross blood tinge, yet we thought of occult blood therein as destroying the reliability of the tests. Of the eight remaining cases three were undoubtedly syphilitic, two strongly suggestive of syphilis and entirely consistent with that diagnosis, two more qualified by localized lymphocytosis and focal cerebrospinal sclerosis only. The remaining case was the one just mentioned of miliary tuberculosis. We regard these results as fairly conclusive of the value of gold sol tests on post-mortem fluids and of the clinical correlation-value of carrying on histological examinations alongside the gold sol tests of fluids from the overlying tissue spaces.

The results seem to lend further strength to the idea of the chemical differentiation of different parts of the cerebrospinal fluid system. We have since had some instances of fluids withdrawn in the process of intracranial salvarsan treatment simultaneously from the pial spaces and from the ventricle, which have likewise shown a difference in gold sol reaction, as also a difference in the Wassermann reaction and in other chemical tests. We regard as at any rate established the idea of the chemical differentiation under different conditions of disease of the ventricular fluid and the pial fluid. Of course, the conditions of disease are such (what with the gluing together of membranes by exudate, and the local fibrosis) that it would be not unlikely that a compartmental situation would develop even if the entire fluid system were freely anastomotic under normal conditions. We have collected authorities on both sides of this question, as to the free intercommunication of fluid in different parts of the cerebrospinal fluid system. There are excellent authorities on both sides of the question, even when that question touches normal conditions. It would seem, however, that not much doubt should attach to the assumption of compartmental conditions in a disease like general paresis. We have occasionally found differences in the gold sol test from subpial spaces in co-ordinate parts of the pial membrane on the two sides.

We commented above upon the fact that the gold sol reaction did not seem to parallel the amount of mononucleosis as found in the meninges or brain tissues in the different parts of the brains studied. Our studies in fluids clinically taken seem to afford proof that several other of the routine tests for the fluid are not exactly parallel in their significance, and do not represent different aspects of the same kind of process so much as they represent different and independent processes. P. G. Weston has apparently given a chemical proof of the non-identity of the albumen and the Wassermann-test-producing bodies from the substance that precipitates the gold in the gold sol reaction. Our own clinical material shows that several of these substances may be found independently of one another, both in untreated cases and treated cases. The treated cases show the non-concomitance, or lack of parallelism, in the tests much more clearly than do the untreated cases. It is very rare in our experience to find a positive Wassermann reaction in a spinal fluid which does not yield some of the other tests also (exception: congenital syphilis). As is well known, the blood serum

Wassermann reaction does not necessarily parallel the spinal fluid reaction. We had an interesting case of paresis in which all the five tests were positive in the spinal fluid, but in which a negative Wassermann was obtained in three successive samples in the series. After two injections of arsonobenzol, the action of the serum in this case became positive and has remained positive in ten successive samples drawn during the course of treatment. As to the globulin reaction, globulin is, of course, one of the most constant findings in all inflammatory processes, and we have found it not very rarely in the absence of a gold sol reaction, a pleocytosis, and a Wassermann reaction. As for pleocytosis, it appears to be the most variable of all the abnormal findings in the fluid. We have even occasionally found it when other tests have been negative.

The wife of a paretic showed in two counts, 12 and 16 cells per cmm. without showing any other fluid features. A twenty-year-old man with signs of congenital syphilis and psychotic outbreaks showed a pleocytosis of 56 per cmm. without other reactions. We have so far never seen a gold sol reaction negative in neurosyphilis when the Wassermann fluid reaction and the globulin reaction were both positive.

Among treated cases we have a number of observations of the usual sort to show that pleocytosis may disappear and all other tests remain positive. We have instances to show a Wassermann reaction remaining positive in which all other tests became negative. Again, the gold sol reaction may remain positive and all the other tests become normal, or the gold sol reaction and the Wassermann reaction may remain positive with all other tests negative. Three cases especially studied showed the gold sol becoming negative while the other tests remained positive. The Wassermann reaction may become negative and other tests positive. We have at times observed a blood serum to become negative, whereas the spinal fluid tests remained unchanged; or, on the other hand, the Wassermann reaction in the blood serum may remain positive whereas the spinal fluid tests all become negative. We can abundantly confirm the observation of others to the effect that the changes in the tests do not parallel changes in the clinical conditions of the patients. In short, these various tests occur under natural conditions,—in untreated conditions independently of each other. They are, in short, separable by chemical means (Weston and others), and they disappear in treated cases at different rates.

The above findings are here reproduced in abbreviated form for the sake of record in the transactions of the American Neurological Association. We hope to publish some of the protocols underlying some of the more important features elsewhere.

REFERENCES.

1. Solomon and Koefod: "Experience with the Lange Colloidal Gold Test in 135 Cerebrospinal Fluids." Boston Medical and Surgical Journal, Vol. CLXXI, No. 24, Dec. 10, 1914.
2. Solomon and Welles: "On the Value of the Gold Test (Lange) with Spinal Fluids obtained Post Mortem." Boston Medical and Surgical Journal, Vol. CLXXII, No. 11, March 18, 1915, pp. 398–406.
3. Solomon and Welles: "Varieties of the Gold Sol Test (Lange) in Several Loci of the Cerebrospinal Fluid System: A Study of Twenty-eight Autopsied Cases." Boston Medical and Surgical Journal, Vol. CLXXII, No. 17, April 29, 1915, pp. 625–629.
4. Weston, P. G.: "The Preservation of Reagents in the Wassermann Reaction." Journal of Medical Research, Vol. XXXII, No. 3, July, 1915, pp. 391–395.
5. Solomon and Welles: "The Development of the Gold Sol 'Paretic' Reaction as compared with the 'Cerebrospinal Syphilitic' Type, considered from the Time necessary to form a Completed Reaction." Boston Medical and Surgical Journal, Vol. CLXXIV, No. 2, Jan. 13, 1916, p. 50.

THE STRATIGRAPHICAL ANALYSIS OF FINER CORTEX CHANGES IN CERTAIN NORMAL-LOOKING BRAINS IN DEMENTIA PRÆCOX.*

By E. E. Southard, M.D.,

PATHOLOGIST, MASSACHUSETTS COMMISSION ON MENTAL DISEASES; DIRECTOR, PSYCHOPATHIC HOSPITAL, BOSTON; AND BULLARD PROFESSOR OF NEUROPATHOLOGY, HARVARD MEDICAL SCHOOL, BOSTON,

AND

M. M. Canavan, M.D.,

ASSISTANT PATHOLOGIST, MASSACHUSETTS COMMISSION ON MENTAL DISEASES.

Abstract.

Dementia præcox and schizophrenia.

Neglect of research into the structural side of dementia præcox.

The question of brain anomalies in dementia præcox as summarized by Kraepelin.

The existence of certain dementia præcox brains without demonstrable gross aplasia, anomalies, or acquired atrophy.

The desirability of microscopic work on dementia præcox brains that look entirely normal in the gross.

Previous work on the dissociation of parenchymatous and interstitial changes in the brains of certain psychotic subjects.

Alzheimer's claim of deep layer cortex changes in catatonia.

Alzheimer, Sioli and Cotton on lipoid materials in dementia præcox brains.

More recent conclusions of Alzheimer as to permanent losses of nerve cells in the second and third layers of the cortex.

Summary of important structural questions in dementia præcox.

Clinical and anatomical analysis of four cases, being the only cases of probable dementia præcox without gross brain changes in a series of 150 autopsies in psychotic subjects.

Microscopic examinations.

Analysis of cases thought to show nerve cell losses.

Distribution of nerve cell losses in the infrastellate region of certain contiguous areas (postcentral, parietal, angular gyrus, superior temporal and area of Broca (Case I)).

Lack of parallelism between gliosis (including satellitosis) and nerve cell losses.

Suprastellate losses more isolated and capricious in distribution (Case I).

Kraepelin's suggestion that the small cell layers of the suprastellate levels are a vehicle for processes of distribution and combination (deeper layers more closely related to circumscribed functions).

Preservation of capacity to perform habitual complex acts in dementia præcox.

Infrastellate emphasis of lesions in Case I apparently exceptional; but the case was probably not schizophrenic.

Infrastellate lesions in Case I possibly related with late catatonia and hallucinosis.

---

* Being M. C. M. D. Contribution No. 1916.24 (whole number 166). The previous contribution was by H. C. Solomon and E. E. Southard, entitled "Notes on Gold Sol Diagnostic Work in Neurosyphilis (Psychopathic Hospital, Boston)." Journal of American Neurological Association. Read at the forty-second annual meeting of the American Neurological Association, May 8, 9 and 10, 1916.

Both suprastellate and infrastellate lesions in Case II.

Predominance of suprastellate lesions in Case III (but slight satellitosis, duration two years).

Case IV marked satellitosis in but one gyrus (right superior, parietal area) and infrastellate as well as suprastellate losses elsewhere.

Shrinkage changes not markedly in evidence in this case and not associated with cell losses; evaluation difficult; axonal reactions also not often found in loci with marked cell loss.

Satellitosis in the fusiform layer in the majority of instances; not characteristically associated with either cell loss, axonal reaction or cell shrinkage.

Satellitosis at times extraordinarily developed in a single gyrus.

The histology of the cerebral cortex in dementia præcox is a topic hardly ripe for discussion. When we remember that the histology of general paresis had only reached a phase suitable for discussion in 1904 or thereabouts, we perceive how immature must be any conclusions drawn from the far more complex situation presented in dementia præcox. In the first place, it may be asked whether we really possess the right to entify dementia præcox at all. To be sure, the term *dementia præcox* has obtained a surprising foothold in all quarters of the scientific world, and studies in dementia præcox appear not only in the German-speaking world, but also in the Russian, Italian, French, English and American literatures; and no practical psychiatrist can afford to neglect the issues drawn by Kraepelin's great synthesizing effort. Moreover, out of the consideration of dementia præcox has proceeded the ingenious and penetrative analysis by the Swiss psychiatrist, Bleuler, of those symptoms and symptomatic tendencies known as schizophrenia. The concept schizophrenia, in a measure adopted by Kraepelin himself, has come to take its place alongside the concept catatonia in a small group of phenomena which are the especial property of the psychiatrist.

In the event, therefore, that dementia præcox fails to establish itself as an entity, nevertheless it cannot be denied that the synthetic effort of Kraepelin has been productive, and has produced a concept which another psychiatric master has been able to utilize for further speculations of great value. Accordingly, I hold that those who would postpone structural and histogenetic work in the field of dementia præcox until its etiology or etiologies have been established are a little unreasonable. Catatonia and schizophrenia, to say nothing of the characteristic emotional disorders of dementia præcox, are phenomena worth study in themselves regardless of their etiology in the prevailing medical sense of the term. We may inquire into the genesis of catatonia, schizophrenia or parathymia, without knowledge of or

inquiry into the etiology of dementia præcox. Whether dementia præcox breaks up into a number of diseases with separate etiological factors, or is replaced by some new nosological unit, at all events the problems of catatonia, schizophrenia and parathymia are likely to stand.

For practical purposes, accordingly, I maintain that we must in the present stage of psychology adhere firmly to the conception of dementia præcox as formulated by Kraepelin[1] and substantially developed by Bleuler.[2] So far as time and opportunity have availed, the senior writer of this paper has been studying the anatomy and histology of cases denominated dementia præcox for some ten years. American interest in dementia præcox was at its height at the time of the Triennial Medical Congress in 1910, when Meyer, Hoch and Jelliffe presented views in which the functional side of dementia præcox was emphasized.[3] It seemed even at that time that the anatomy of dementia præcox could not safely be neglected; yet it does appear that the anatomy of dementia præcox and of mental diseases in general, outside the neurosyphilitic group, has been somewhat unduly neglected on account of the diversion of young psychiatrists into functional fields. It is well enough to speculate concerning the physiology of mental disease, and one should not decry modern tendencies when such brilliant work as that of Bleuler has emerged from these speculations. One mentions this matter only to justify the extraordinary neglect which the structural fields of dementia præcox have suffered, notably in America, where several scores of laboratories might be available for these pursuits.

The present work accrues from an extremely laborious piece of microscopic work done by the junior writer of this paper. She should not be committed here to the speculative conclusions drawn by the senior writer, who will accordingly lapse into the first person from time to time. Since the major portion of this work has been completed, the third volume of Kraepelin's "Psychiatrie," 1913, has appeared, and we have the advantage of Kraepelin's summary of structural investigations in dementia præcox. The internal evidence seems to demonstrate that Kraepelin's chapter on the endogenous deteriorations (dementia præcox and paraphrenia) hardly made use of any literature beyond 1911. It seems worth while to summarize briefly the statements of Kraepelin as to post-mortem findings in dementia præcox, together with some account of the general specula-

tions very briefly appended thereto by him. I had myself been interested from the beginning in the anomalies and scleroses of dementia præcox brains, and had concluded from my own studies, which ran parallel with studies by the same criteria of manic-depressive material, that the potential victim of dementia præcox was probably born with the normal stock of brain cells, that the dementia præcox brain is subject rather to aplasia than to agenesia, and that the acquired atrophy apparent in certain cases was grafted on top of a congenital aplasia.[4] These ideas, uttered in 1910, were given special illustration in 1914–15.[5] I do not find that Kraepelin has taken special account of my structural work upon dementia præcox, but he calls attention to the work of several writers pointing in the same direction. Thus, Agostini has described traces of developmental arrests as well as residua of early disease of the brain. Mondio found convolutional anomalies in six cases regarded by him as signs of degeneration. Schröder's finding of dislocation and binucleate condition of Purkinje cells as well as syncytial formations in the pyramidal cells of the cortex found in one carefully examined case, may be regarded also as looking in this direction, and this finding of Schröder has been favorably commented on by Alzheimer. Doutrebente and Marchand have also described numerous nerve cells having an embryonic appearance in certain cases. Despite these data and the, at that time, inaccessible work on anomalies and scleroses above mentioned, Kraepelin regards the gross anatomy of dementia præcox as negative. It was for this reason that the special work here reported was done upon normal-looking brains. There can be no question, in my opinion, that the brains of dementia præcox patients are more than usually subject to convolutional anomalies. Of course I grant that in the matter of anomalies, all depends upon the criteria which the examiner adopts; but whereas four-fifths of my dementia præcox brains have exhibited anomalies according to the criteria adopted, only one-fifth of the manic-depressive brains examined with the same criteria have exhibited such anomalies. I have latterly subjected this problem to special review with the advantage of systematic brain photography, which has afforded unparalleled opportunities for the careful comparison of hundreds of brains of all kinds, with and without mental disease, and although I am not prepared to report on the number and nature of anomalies in the already extensive material, I am certain that without the systematic aid which

photography affords, the entire field of convolutional anomalies must remain unworked.

It is singular that the familiar paradigm of "structural" mental disease, general paresis, itself often exhibits no gross lesions or anomalies of the brain.[6] If one were searching for entirely normal brains to study from a gross anatomical standpoint, one would perhaps rather more easily find such a brain in general paresis than in dementia præcox; despite the fact that the paretic brain would on microscopic examination exhibit appropriate diffuse and extensive changes.

I hold that there is considerable evidence in the literature for aplasia, not, I think, for agenesia (in the sense of a condition in which nerve cells were not originally laid down in proper numbers), and that my own estimate of the proportion of anomalies in dementia præcox brains has not been controverted.

However, my own work indicated that there were certain victims of dementia præcox who possessed brains at death without demonstrable aplasia, without anomalies, and without acquired atrophy on top of the anomalies; in short, who possessed anatomically entirely normal brains. I did not find so many of these anatomically entirely normal brains in dementia præcox as I did in a special series of general paretic cases personally examined by me some years since; for in the paretic series, there were no less than 18 of the 38 brains in which upon finical examination I was unable to find substantial lesions. Of course, the thickening of the pia mater in some of these 18 substantially normal paretic brains might yield a pointer in favor of paresis, yet pia mater thickenings were themselves absent or of negligible nature in certain cases, and thickenings of the pia mater are not infrequent in dementia præcox brains (as Kraepelin himself states), as well as in (so far as I know) all other brain series, whether those of normal or psychotic subjects. Limiting ourselves to the brain substance, one would, in short, find not only in paresis, but perhaps to a lesser extent in dementia præcox, absolute normality so far as our present methods avail.

In view, therefore, of Kraepelin's silence as to brain anomalies (other than those of largely microscopic nature above mentioned) I determined that I would do preliminary microscopic work on brains that were entirely normal in the gross. I preferred to deal with the cerebral cortex rather than with the optic thalamus, cerebellum, or spinal cord, in which changes have been described, some of which may depend upon developmental difficulties or

acquired disease due to the same factors that produce the psychotic picture of dementia præcox. If, however, the developmental difficulty had left the cerebral cortex grossly intact, yet, nevertheless, its psychotic operations (if the term may be pardoned) must be looked on in the present phase of psychiatry as due in large part to cortical difficulties. Accordingly, I chose to work, in the first place, on the cortex. In 1914 I reported that the only two normal-looking brains in my series of 25 microscopically yielded abundant appearances of cell destruction and satellitosis in the cerebral cortex, which, as I felt, had not yet had time to be registered in the gross. These were, however, cases of but three weeks' and two months' duration respectively, and I questioned whether they might be regarded as cases of dementia præcox by all readers. I find that readers in the dementia præcox literature are exceedingly liberal in discounting other psychiatrists' diagnoses of dementia præcox, particularly if the other psychiatrists uphold views not favored by the critics. One estimable critic, recently reviewing Mary E. Morse's work on thalamic lesions in dementia præcox,[7] dismissed the findings by charging that the cases were doubtful as to their status in the dementia præcox group, not appearing to observe that the cases were after all cases of something and that they at least showed thalamic lesions. In the present status of dementia præcox inquiry, I must beg to insist that it is not well to be too sure as to what dementia præcox is and is not. One safeguard, perhaps, is to examine cases of manic-depressive psychosis, to say nothing of the toxic-infective-exhaustive group, alongside cases of dementia præcox. Stranger things have happened in the history of medicine than that entirely new lines of division should appear in the midst of a group of cases thus constituted; for example, by dementia præcox, manic-depressive psychosis, and various examples of the toxic-infective-exhaustive group.

In view of the doubt whether dementia præcox brains are usually anomalous or to any degree sclerotic, and in view of the doubt of the diagnosis, especially in cases of brief duration, I felt that I should choose cases of relatively long duration in whose brains I could not myself detect anomaly or sclerosis. At the same time, I examined available cases of manic-depressive psychosis. I have elsewhere sufficiently discussed the method of arriving at the five cases of normal-looking brains (three of dementia præcox and two of manic-depressive psychosis), and I am publishing in full in the Transactions of the Association of

American Physicians an account of some of the general results of that study of five normal-looking brains.[8] For the purpose of that Association, I was merely endeavoring to illustrate the possibility that chronic mental disease might possibly be consistent with normality of the brain. After securing about twenty brains free from gross lesions and anomalies and from any abnormality detectible by systematic photography, a microscopic examination was made of a few sample areas and the list decreased to five normal-looking brains without much, if any, microscopic change detectible in sample areas. I showed how these cases upon more extensive examination proved to be far from normal in four instances, and I showed that even the fifth (a case, perhaps, of paranoia) was not free from flaws. The title of the paper to which I now refer: "On the Dissociation of Parenchymatous (neuronic) and Interstitial (neuroglia) Changes in the Brains of Certain Psychopathic Subjects, especially in Dementia Præcox" indicates the line there taken. I seemed to be able to show that the most severe cell loss might be entirely unattended by interstitial (neuroglia) change. Again, I seemed to be able to show that the most severe interstitial change might remain unaccompanied by cell loss. Other cases assumed an intermediate position with regard to cell loss and interstitial change. The point was raised whether we could not approximate in chronic mental disease the old classification of kidney diseases into parenchymatous, interstitial and diffuse diseases.

Incidentally, I showed that the case with the least cell loss was one of manic-depressive psychosis. Curiously enough, there was a comparatively severe gliosis in this case despite the fact that there had been no induration of the brain in the gross. The case was, to be sure, elderly, and the gliosis may have been incidental to the age process or to unknown factors. Another elderly case, one of dementia præcox, however, had far less gliosis than did this case of manic-depressive psychosis. The parenchyma alone, in any event, had suffered very slightly in this case of manic-depressive psychosis. The interesting findings of Orton may be recalled in this connection, for Orton found a surprising degree of satellitosis in cases of manic-depressive psychosis where, on account of the early suggestions of Alzheimer, we had been prepared to find far less than in the dementia præcox.[9]

One other case of manic-depressive psychosis (if we are to adhere to the clinical diagnosis actually given) failed to show

such extensive gliosis and did indeed show a large degree of cell loss, although the patient was not advanced in years. This case I shall append to the present study as probably a case of dementia præcox. The three remaining cases of dementia præcox (one of which may have been paranoia and was so regarded by some) form the rest of the present study. Three of these four cases (namely, all except the questionable paranoia) were afflicted with active tuberculosis. It is a question how far we should assign the large degree of nerve cell loss in these cases to tuberculosis acting, perhaps, in some toxic manner. My colleague, Dr. H. I. Gosline, has been working in this field and I do not intend to discuss the question here. It is, I believe, necessary to find and study by appropriate methods a large group of non-tuberculous cases of dementia præcox as well as a large group of cases that are not complicated by other bacterial infections.

In the above-mentioned paper on the dissociation of parenchymatous and interstitial changes in dementia præcox brains, I had no occasion to advert to topographical and stratigraphical considerations. These latter are of extreme interest in dementia præcox as well as in psychiatry at large. Kraepelin, in 1913, speaks once more of those cases of Alzheimer that presented a picture of delirium acutum and received the diagnosis of catatonia, as showing cortical changes, particularly in the deep layers (nuclear swelling, nuclear membrane folding, shrinkage of cell bodies, tendency to cell destruction). Microscopic examinations of a few sample areas in all fifty of the cases that I have previously presented did not very strongly substantiate these findings. At all events, they did not substantiate the limitation of the changes to lower layers. On account of a variety of considerations, partly technical, a certain amount of doubt attaches to such nerve cell changes as are here mentioned, and more attention has been leveled at the findings of Alzheimer with respect to satellitosis in the deeper layers. Before coming to the matter of interstitial changes, however, the work of Nissl, Wada, Sioli, Moriyasu and Goldstein on nerve cell changes may be mentioned from Kraepelin's 1913 summary, and to this should be added the extensive work of Cotton on nerve cell changes.[10] It is the service of Alzheimer, Sioli and Cotton to have shown the deposits of lipoid materials in and outside of nerve cells in dementia præcox. None of these authors claims that the findings are differential for dementia præcox, despite their importance in our ideas as to the genesis of the condition. Our

own work has not dealt, except in a few demonstration preparations, with these lipoid findings. I have felt that the chances for confusion between essentially dementia præcox products and products of intercurrent disease were large; Alzheimer himself has, I believe, found such changes in cases of toxic delirium, and Cotton holds that these are merely quantitative differences between what is found in dementia præcox and what may be found in certain cases of senile dementia.

In this situation, it seemed to me that we must hold rather to evidences of cell loss than to evidences of abnormal lipoid deposits in dementia præcox brain tissues. Nissl is quoted as having regularly seen extensive cell disease leading to considerable cell losses. Alzheimer has described widespread cell changes of a chronic appearance, especially sclerotic cells. He also, according to Kraepelin, has been able to find diffuse losses of nerve cells, particularly in the second and third cortex layers. In any event, the large pyramidal cells seem to be relatively less markedly affected. There is some literature as to neurofibril findings which several authors describe as "injured." It might be supposed that the myelinated fibers would be somewhat affected, and some authors (Goldstein, DeBuck and Deroubaix) have described slight changes therein, especially in supraradiary fibers. The situation, then, is that certain authors, particularly those of the Nissl-Alzheimer group, contend that dementia præcox brains do show more or less nerve cell loss of a diffuse nature, and that the nerve cells that remain are often affected with more or less fatty degeneration. It is doubtful whether these authors would regard their findings as specific or pathognomic for that disease; "characteristic" would be the more appropriate designation.

We have, accordingly, examined our cases with great labor and have recorded our findings as to nerve cells in all layers in numerous areas in each hemisphere. We have noted also neuroglia and vascular conditions so that our recorded data for each case ran from 144 to 232.

The general pathologist might well inquire whether the blood vessels in dementia præcox do not show changes, and Kraepelin mentions a few authors who have found such changes but he regards them as due to intercurrent conditions of old age, alcoholism, syphilis, and the like. If we can safely dismiss the blood vessels and their concomitant connective tissues from consideration, we must approach the neuroglia question. There

are, of course, certain problems as to the origin of the neuroglia, notably as to whether they may not be of mesoblastic origin for certain nerve cells; and this problem may arise particularly in connection with *Stäbchen* cells; but rod cells, like isolated plasma cells, do not have a particular significance or frequency in dementia præcox, and the problem for our purposes may be neglected. There is little doubt that undue attention was given to gliosis and satellitosis of the deeper layers in dementia præcox, partly owing to an overvaluation of Alzheimer's early statements which that esteemed pathologist did not himself entertain. Occasional speculations as to the interference with vegetative processes in dementia præcox have been made, based upon the idea that the characteristic process in dementia præcox was a process in the infrastellate layers, namely, those we possess in common with the lower animals. Nissl also observed in the deeper layers numerous large nucleated cells such as are usually found only in the outermost layer of the cortex. Nissl, too, described other swollen neuroglia cells closely investing nerve cells in the lower layers. Sioli and Elisah also concur. In point of fact, the permanent losses of the parenchyma according to Alzheimer's mature conclusions affect the nerve cells of the second and third layers of the cortex, despite the fact that the deeper layers are also affected in concrete cases of the disease, as therein shown by glia changes. Here is, accordingly, a most important topic for research. We have collated our results with the question in mind, whether nerve cell changes and the neuroglia changes are characteristically suprastellate or infrastellate. We shall consider below the Kraepelinian speculations concerning the differential significance of changes in these layers.

Besides the stratigraphical question, there is a topographical question. Despite the fact that the gross anatomy of the dementia præcox brain is virtually negative so far as Kraepelin was able to find in the literature, he was able to gather from microscopic examinations by several workers (Mondio, Zalplachta, Agostini, DeBuck, Deroubaix, Dunton, Wada) that the frontal lobes, the central regions, and the temporal lobes are more markedly affected than the occipital region. A number of functional conclusions are drawn by Kraepelin from these statements, an analysis of which I have given in my paper in 1914, noting especially that my own findings in the central regions relate rather to the postcentral tissues than the precentral tissues. In this work we have endeavored to collate our findings

by regions also, so as to throw light if possible on the important question raised by Kraepelin as to whether future research will show that the cortex changes are widespread in a uniform manner throughout broad regions of the cortex. We approach our case material, accordingly, with the following questions: —

First.— Are there cases of dementia præcox without gross anomaly or sclerosis which show characteristic parenchymatous and interstitial changes?

Second.— Are these changes characteristically found in some areas rather than in others?

Third.— Are these changes characteristically found in some layers rather than in others?

Fourth.— Within a given brain, are the stratigraphical changes rather apt to be confined to the same layers?

Fifth.— What attitude shall we adopt as to the question of the relative importance of suprastellate and infrastellate lesions?

The following are somewhat full analyses of the clinical histories of three cases of the dementia præcox group (I (10.9); female with at least fourteen years of pronounced symptoms, with death at fifty-six; II (12.41) a female dying at sixty years, with at least ten years of pronounced symptoms; III (12.47) a female of twenty-seven, dying with two years of pronounced symptoms), together with a case (IV (11.36) a female dying at thirty-one, with approximately two years of pronounced symptoms) which, although clinically diagnosticated manic-depressive psychosis, we are inclined upon further analysis to regard as a case of dementia præcox. It is, perhaps, to be regretted that the obvious onset of symptoms in two of these cases was in the forties, but the fortune of the laboratory yielded precisely these cases of, apparently, dementia præcox with brains normal-looking in the gross.

Case I. (10.9).— The patient was admitted to the Boston State Hospital in October, 1907, aged fifty-two years. Is reputed to have had normal development, graduated from high school, and married at eighteen years. She had two children and one miscarriage, was divorced at twenty-six and again married. In 1904 at the age of forty-nine, she was sent to the River Crest Sanitarium, New York, where she remained for three months and was removed against the advice of physician, coming to Boston State Hospital as above three years later and remaining one year and two months.

The onset of the mental disease was gradual with seeming jealousy, but seven years ago this developed sufficiently to be called a delusion, and

for the entire seven years, though getting along fairly well, has entertained the same ideas; onset therefore at forty-five years, death at fifty-six.

Physically.— At thirty-seven had ovarian trouble; was to have been operated but recovered without. At forty had "congestion of the brain," but was not delirious. At forty-six had pneumonia. Other than these illnesses was always well.

On the commitment papers (Drs. A. C. Jelly and Albert J. Shaw) patient said: "My husband is a bad man. My sister is a corrupt woman. She has been the mistress of several men. I have seen her in bed with six men at once. She has a piece of apparatus which she uses to kill people. She has a steel trunk in which she disposes of their bodies, etc." Carries a pistol and used to know how to shoot.

In the hospital she was described as being a refined looking woman (see French nobility in heredity) of medium height (5 feet). Small clear-cut features, white hair and bright eyes. She was well developed and nourished, but has a markedly asymmetrical face with left eyebrow higher than right, and a tense and strained expression of eyes. There is no disturbance of reflexes tested (eyes and tendon) and with the exception of slight blowing systolic murmur at apex nothing is found worthy of note in physical examination.

Mentally she has a wealth of paranoid ideas regarding her foster sister and present husband and including most of her acquaintances. There is no limit to her delusions. Is resistive about going to bed and complying with ward routine, and eats poorly because she is controlled by ideas that the food is poisoned.

On a visit to her home of three months' duration she was better for a month, then began being extravagant, talked freely of her delusions and scolded for hours of her husband's unfaithfulness and abuse; was returned and later was discharged, *not improved*, in February, 1909, after hearing nothing from her after removal by husband and sister in August, 1908.

In July, 1909, she was committed to the Worcester State Hospital, No. 26211, the husband stating he could not tolerate her erratic manner any longer. She was painted and powdered but submitted to hospital routine better than before, but writes and talks of being "kidnapped," and describes a scene of violence in being taken from her flat to the hospital. Speaks overconfidentially. She dresses in brilliant colors and wears a lace coat of a peculiar pattern at all times, dresses youthfully and with ribbons in her hair. She has no insight. She has some untidy habits which she denies. She destroys her clothing and that of other patients, and when her sister came to see her, stole her sister's keys, money, furs and wrist bag and demanded to go, making a great fight for freedom when her sister left; was abusive in her language, etc.

Again in Boston State Hospital by transfer from Worcester State Hospital on request of sister. She decorates herself with buttons, arranges her hair in little curls, talks continuously in a rapid, rambling manner and makes many fantastic statements. Denies the existence of present hus-

band as such. Is troublesome and persistent, does not want her door locked, writes incoherently of her sister's relations with husband and other men in elaborate detail by street numbers and dates. Tries to make her escape.

In 1910.— She evidently has auditory hallucinations. Stands listening at keyholes and shouts to imaginary folks. Still is persecuted by her beliefs of people coming to kill her. Makes various attempts to escape. Was placed in wet packs, after which she became more quiet. For a time was tube-fed; states she has no stomach, no intestines and that she is poisoned, no blood in her body — attempted self-injury. Was resistive to passive movements and exhibited cerea flexibilities, keeps her eyes closed, retains constrained and peculiar attitudes, but eats voluntarily now.

During last month of life rapidly developed a bed sore and died of septicæmia.

Autopsy performed two hours post mortem, Oct. 21, 1910, by M. M. C.

The skin was icteric and there was a mulberry stone in the gall bladder. The kidneys showed an acute parenchymatous nephritis and there was a swelling of the spleen. The ileum showed a slight congestion. There was trochanteric and sacral decubitus.

As for chronic lesions, the thyroid showed a fibrosis in connection with which the growth of hair on the lips, chin (normally distributed), over the temples, is of note. There was atrophy of the ovaries. The aortic valve showed a chronic fibrous, vegetative process and the ventricular walls were somewhat fibrotic. The spleen showed capsular changes.

On account of the tuberculosis found in the other autopsies of this series, it is of note that the lungs were normal throughout, a finding somewhat rare in autopsies in hospitals for the insane. However, the left pleural cavity was completely obliterated by fairly firm adhesions.

Following is a description of findings in the head. Calvarium dense, not unusually thick. Dura is thickened but not adherent to calvarium. The pia mater is slightly thickened; some subpial fluid. Some slight injection of the pia mater. Hemispheres sag on board, exposing the corpus callosum. Lateral ventricles smooth and delicate. Basal vessels smooth. The convolutions are apparently normal, are plump, and the brain has a nearly normal consistence. The pons and olivary bodies slightly reduced in consistence. No areas of sclerosis or softening otherwise.

Brain weight 1,100 grams. Pons and cerebellum 145.

Middle ear drums opaque. The pituitary and ganglions negative.

Cord slightly softened in the lumbar region.

Case II (12.41). *Heredity.*— The patient is stated to have had a dissolute father, and as a young girl had an illegitimate child. This child lived to the age of twenty-seven, dying eventually of pulmonary tuberculosis. He was a good scholar at school, worked as an office boy, and later ran a small but successful stationery news store, becoming a very much respected young man. Later she began to live out of wedlock with another man and had two children, one of whom was an idiot or imbecile

with a deformed head; the other died in infancy. Apparently the patient had no brothers or sisters. Her mother is thought to have died at her birth or shortly after.

Personal History.— The patient was born in 1852, of a wealthy father who lost his money through mismanagement and dissipation. The patient went to live with an uncle at fourteen years of age, attending an academy. She shortly had an illegitimate child by her uncle's stepson, whereupon she was turned out of the house and began to earn her living in a shop. She drifted into work as a waitress, maid and lodging-house keeper, afterward having children as above stated. At twenty-five years of age patient is thought to have had a religious change come over her after attending church. When her paramour refused to marry her, she left him and became active in church work. She did odd bits of work, kept boarders and did church work. The people who knew her after she got religion always had the impression of something lacking. She was devoted to the children, a neat housekeeper, kind to neighbors and friends, but never appreciated efforts to help her. Although she was able to read a scholarly book on theology and the like, and to talk about it at length, recalling its contents, the people felt her knowledge was but verbal. In the fifties she became apparently mildly deluded about the pastor of the church, circulating stories of his misconduct, and she created several disturbances by shrieking in the church and by talking about the pastor's "influence" over her. She then began to threaten his life and was committed.

The summary of the mental examination at the Boston State Hospital showed a psychosis of indefinite duration, becoming somewhat more pronounced for about a year, together with the onset of pulmonary disease. The main mental symptoms appeared to be unsystematized persecutory delusions, with the possibility of hallucinations or illusions of a somewhat vague nature. The patient stated that about a year before coming to the hospital a certain pastor had irritated her by turning the leaves of a book at a musical entertainment, thereby causing her to smile. As the pastor went out, he went three times zigzag before her. Ever after this time the patient had been a sick woman, holding the belief that the pastor had hypnotized her. "It is possible that many deaths in the church of late have been caused by the pastor." It appears that for some years the patient has been regarded as peculiar, irritable and rather abusive of the church committee when they attempted to help her. The patient said she saw black hands waving before her eyes. During the pastor's sermons she had cried out "Hypocrite; the devil spite him. Hypocrite; the devil spite him," after which she went to the Sunday school and denounced the pastor. After the development of the pulmonary disease the patient took to bed, but later gained strength and threatened personal violence to an old friend who had come to stay with her, so that the friend left suddenly. The patient repeated the story over and over again of being hypnotized.

The positive findings on entrance were emaciation, slight development of hair on upper lip, musculature poor, waxy skin, papillar eruption of skin, deep-set but prominent eyeballs, early arcus senilis, grips weak, somewhat exaggerated knee-jerks, signs of pulmonary tuberculosis, rapid heart, peripheral arteriosclerosis.

Mentally the patient gave the impression of refinement; she had a keen glance and co-operated perfectly in the examination, frequently making humorous sallies, evidently enjoying her own wit. Her memory was apparently good in the main for remote events. She described in more or less detail her illicit relations with two men as above described.

It is not clear whether the patient actually had hallucinations. She stated that she saw black hands and queer signs, such as a cat jumping over a pitcher. These signs occurred occasionally when the patient was dozing and upon waking up. It is possible that she should be regarded as hypnotic. The patient was in general paranoid, speaking about lies and misrepresentations of her character by a woman who had lived with her. Her ideas concerning the pastor remained, and patient resented the fact that the members of the church had not come to see her. She would occasionally express her opinion forcibly and with objectionable language. Once she said she wished to have nothing to do with male physicians, and accompanied her statement by spitting several times upon the quilt. Patient complained of the food and also of her own stomach, but refused to take medicine. In the summer patient developed diarrhœa, which persisted to death.

The Diagnosis.— In this case perhaps we must regard her as in some sense below par on account of her dissolute father and her own illegitimate children. She was undoubtedly not feeble-minded in the sense of being unable to support herself throughout the most of her life. Whether there should be a psychotic interpretation of her conversion to religion is also doubtful. The patient's paranoid condition is certainly the main mental symptom. The description of visual hallucinations is too vague for use. The development of amnesia was apparently a late phenomenon in the case. Certain lability of emotion, irritability, threats of violence, and a certain impassivity, are practically the only remaining symptoms of note.

The autopsy was performed three hours post mortem by Dr. Mary E. Morse, and showed that death was due to a thrombosis of the left common and internal iliac veins. There was a marked bilateral pulmonary phthisis, with tuberculous lymphnoditis, and a tuberculous ulceration of the lower ilium, the cecum and the colon. Miliary tubercles were found in the liver (weight, 1,080 grams), and also in the unusually large, firm spleen (230 grams). There was a slight degree of hyperpericardium, a slight hypertrophy of the left ventricle, and a slight thickening of the mitral and bicuspid valve edges. The aorta showed a number of raised yellow placques. The body was emaciated and the skin of a waxy appearance.

The description of the brain has to be brief through lack of lesions. The brain weighed 1,130 grams, which is possibly a slight reduction from

the normal weight as estimated by Tigges' formula. The pia mater is described as slightly thickened and as edematous. The brain substance was firm. There was a considerable amount of cerebrospinal fluid. The dura mater was adherent to the pia along the middle line.

CASE III (12.47). *Heredity.*— The field study of this case was unsatisfactory but demonstrated that the patient has two brothers, both with police records for drunkenness. One of the two brothers has a record of repeated arrests, and also has a son, a neglected child, now in a Catholic institution for homeless children. The patient's father and mother were born in Ireland, dying at sixty and sixty-five respectively, the mother of tuberculosis; the father is stated to have been temperate.

Personal History.— Patient was born in 1885, in Ireland; is described as of a happy disposition as a child. She went to school for four years and learned to read and write. (The patient's brother is unable to read or write.) The patient came to the United States at twenty years of age and went into domestic service.

The patient was found wandering about the streets aimlessly, and was brought to the hospital by the police, continually repeating the words, "Father Patterson, Father Patterson." It appeared that she had lost her position on May 10, 1911, and during the next six weeks had developed mental symptoms. It is, of course, possible that mental symptoms had developed before the patient lost her position. No details were obtainable on this point, although the patient had once stated that she was an Irish girl who did not understand much English.

On admission, the patient, 5 feet 1 inch tall, weighed 72 pounds. The positive findings were as follows: Narrow palate, flabby musculature, skin eruption upon forearms, dull expression, slightly dilated pupils, slow, poorly marked dermographia, general muscular weakness, weak grips, diminished knee jerks, signs of tuberculosis of the lungs, weak heart sounds, Riggs' disease, furred, dry tongue, tenderness over lower pelvic region (relieved by catharsis).

Mentally the patient arrived in an exhilarated and confused state, and was non-co-operative for the majority of tests. Patient complained of a general feeling of weakness, frontal headaches, refused to write, and remained quietly in bed with an apprehensive attitude.

The patient developed three attacks of vomiting, relieved after catharsis. As soon as the patient was dressed she would become apprehensive, fearing injury from those about her. There were spells of depression with weeping. There was delay in answering questions, but it was a question whether this delay was retardation or blocking. The physician's certificate stated that the patient had been both restless and cataleptic. At first there was no evidence in this direction. The patient's reticence and admissions that she feared examination were indecisive as to the diagnosis, and the diagnostic summary speaks of a psychosis in a white woman, twenty-six years of age, of sudden onset and six weeks' duration, characterized by apprehensiveness, depression, some understanding of her surroundings, a sug-

gestion of retardation, and emotion not corresponding with her general attitude.

After admission, however, the patient became apathetic and indifferent, had to be urged to take food, began to expectorate carelessly on the bedclothing, would as a rule give no reply to questions, and would occasionally whimper childishly. The patient gained weight upon a special diet, but drooled, would reply in whimpering monosyllables, and in the course of a month became entirely non-co-operative. She is described as sitting for long periods with her eyes closed and her head turned to one side (apparently the left), with both arms extended, hands clenched, one hand over the left eye. Placed in other natural attitudes, the patient would retain them, showing a characteristic and marked *flexibilitas cerea*. She remained mute, so far as the records show, from August, 1911, to July, 1912. She would sit up daily but would assume the above described position. Patient was given to vomiting frequently, but this tendency could be somewhat reduced by bismuth and bicarbonate of soda. The vomitus contained some blood. Latterly the patient lay in a sort of catatonic stupor, but July 1, 1912, she asked the physician if she could get up, as she was tired of lying in bed. She stated that she felt well, was as happy as she could be and had nothing to worry her. She showed what was interpreted as amnesia for recent and remote events; was disoriented for time and place. She began to feed herself, had a fine appetite, but drooled saliva from the mouth, mixed with food. It was suggested that she kept her head covered with her arms in the endeavor to exclude auditory hallucinations. Patient complained of headaches and dizziness; she was very untidy. October 14 the patient had a fainting attack, regarded as due to general weakness. She was put to bed and lay in what seemed a catatonic stupor, although she once rose from bed without the nurse's knowledge and attempted to go to the toilet. She fainted and injured her forehead. She took food only upon urging. Decubitus of left buttock developed. The feet were cyanotic. The patient died Oct. 21, 1912.

Diagnosis.— There seems little doubt that this case is one of dementia præcox. At all events, catatonic signs, including *cerea flexibilitas*, mutism and stupor are characteristic enough. The headaches and vertigo are consistent with the diagnosis, as also the probable auditory hallucinosis, apprehensiveness, incoherence and confusion. To be sure, the patient exhibited a number of reactions more or less characteristic of manic-depressive psychosis, such as an apparent retardation, exaltation, depression, lability of emotions, persecutory delusions and the like. It seems to be accepted on all sides that dementia præcox patients may show manic-depressive symptoms, whereas manic-depressive psychosis should not show characteristic schizophrenia.

The autopsy was performed four hours after death by Dr. M. M. Canavan. The anatomical diagnoses may be grouped as follows: —

Death was apparently due to complications of septicæmia from a sacral and trochanteric decubitus.

Active lesions were as follows: advanced pulmonary tuberculosis; tuberculous peritonitis with ascites; enlarged mesenteric lymphnodes; tuberculosis of the liver, spleen, ovaries and tubes.

The body was emaciated and the skin slightly scaling. There was a fibroma of the uterus.

The brain weighed 1,210 grams, slightly in excess of the weight as estimated by Tigges' formula; body length, 148 centimeters. There was a suggestion of opacity in the pia mater. The brain substance appeared normal to inspection and palpation. The blood vessels yielded an impression of being small and showed no sclerosis.

Case IV (11.36). *Heredity.*— The patient's fraternity consisted of two boys, dying in infancy of unknown cause, and seven girls, all still alive. Concerning four of them no data are available except that three are in domestic service in Boston. One sister is stated to be neurotic, thin and suggestive of tuberculosis. A sister, informant, is well. Patient's father died at seventy-three of heart disease. A paternal uncle died in old age of heart disease; another paternal uncle died in old age with diabetes; a paternal aunt died in old age, rheumatic. The mother is alive and regarded as normal, but no further data are available except that the mother's fraternity died in old age also, with diabetes and heart failure. The field examination in this case was more than usually unsatisfactory. The most definite points are that patient has a neurotic sister and that heart disease and diabetes are in both parental fraternities.

Past History.— The patient was born in 1881, in Nova Scotia. She went out as a domestic at sixteen years. She is stated to have cared for a woman who died of tuberculosis, and her sisters have thought that she contracted tuberculosis at that time. Her disposition then became somewhat irritable, but no psychotic symptoms appeared. At the age of twenty-four the patient was at the Rutland Sanatorium for the tuberculous for a period of six months, and there gained forty pounds. Later she was at Boston Consumptives Hospital, from whence she was transferred Jan. 14, 1910.

Data from the Boston Consumptives Hospital indicate that she was stolid and indifferent when first admitted, but in the course of a few months became extremely joyous, screaming, singing and calling out loudly in the ward. At times she would abuse the attending physicians. Her activity developed into mania, in which she ran about the bed, stood up in bed, and screamed discordantly at the top of her voice without apparent occasion. Once she threw her beads across the ward at a patient, injuring her; at times she threw dinner plates to the floor.

Upon admission to the Boston State Hospital the positive symptoms and signs were as follows: pallid skin and wrinkles about eyes (suggestion of premature aging), narrow palate, carious teeth, papules on back, weak grip, slight fine tremor of tongue, signs of tuberculosis in both upper lobes and suggestion of cavitation in the outer part of the left upper lobe. (Autopsy eventually showed two purulent areas 3 × 4 centimeters in the left upper lobe.) Erratic, weak heart; slight clubbing of fingers. Sensory

disorder was confined to hallucinations of hearing which, according to patient, had troubled her for some time and had caused her to perform foolish and mischievous acts.

Shortly before her death the patient complained of considerable pain on the inside of the right arm and over the right chest, which pain was thought to be related to the pulmonary tuberculosis. Intellectually the patient was well oriented and able to give a clear account of herself if she could be made to be confidential. There was no evidence of memory impairment. The patient agreed that she might have been a little insane when she came to the hospital, and fully aware of her tuberculosis. Patient's facial expression was bright and her conversation was not unusual except for the adoption of a mischievous and silly tone and a tendency to act somewhat foolishly during the examination. Emotionally the patient was elated, possibly mildly erotic, inclined to be meddlesome and mischievous, and inclined to laugh without apparent cause during conversation. Volitionally the patient's history indicates that she at times performed impulsive acts. She was often much disturbed, screaming loudly; at other times she became quiet, even assisting somewhat with the ward work, and for a period of a few hours would be quiet, reading a religious book. The patient was admitted Jan. 14, 1910. Feb. 27, 1911, her temperature began to be more marked; tubercle bacilli were found. In August, 1911, patient developed a bloody diarrhœa, and died August 12.

The diagnosis of manic-depressive psychosis made upon admission to the State Hospital was doubtless grounded upon the patient's obvious mania. The diagnosis remained unchanged. It is somewhat curious, however, that it would be not impossible to build up a theory that the patient was really a victim of dementia præcox despite the fact that she was clearly enough a victim of maniacal symptoms in themselves entirely characteristic of manic-depressive psychosis. In the first place, the patient herself described auditory hallucinations which had been of some standing; that is to say (though the data are here fragmentary), probably of some years' standing, since they developed doing housework which the patient performed after leaving Rutland Sanatorium, at twenty-four, and before going to the Boston Consumptives Hospital. It is a moot point whether auditory hallucinosis is found in manic-depressive psychosis. It is certainly not characteristic of that psychosis and may be regarded as somewhat more characteristic of dementia præcox. Again, impulsive acts as described at the Boston Consumptives Hospital might contribute to the diagnosis dementia præcox, as well as a certain silliness in the patient's conversation. She is also described as having been stolid and indifferent early in her stay at the Boston Consumptives Hospital.

To sum up, it is true that the patient's hypomania under observation at the Boston State Hospital, exaltation, exhilaration, and labile emotions, may be regarded as characteristic of manic-depressive psychosis. It is also true that the patient's phase of indifference, persistent slight silliness, impulsivity and auditory hallucinosis might be regarded as consistent with

dementia præcox. The total duration of the psychosis is set at twenty months, but if her own story of hallucinations may be trusted, the actual duration may have been somewhat longer.

The autopsy was performed eighteen hours post mortem by M. M. C. The cause of death was a generalized tuberculosis. There was a tuberculosis of the appendix, which may have given rise to the bloody diarrhœa. The mesenteric lymphnodes were also tuberculous, as were the ilium and colon. There was pulmonary tuberculosis, with chronic adhesive pleuritis of the left side. There were chronic changes in the pericardial wall, hypericardium, hypertrophy of the heart, and a sclerosis of the arch of the aorta, which was exceedingly small, admitting but one finger and measuring approximately 2 centimeters in diameter. There was a cystic organ of Rosenmüller. The skin, and especially the scalp, showed a scaling lesion, and there was sacral decubitus. The kidneys showed in the gross a chronic interstitial process, and the liver appeared fatty.

The brain weighed 1,140 grams; apparently a considerable reduction from the proper weight by Tigges' formula (body length, 152 centimeters). There were no lesions of the pia mater, and no detectable lesions of the brain, which was pale. There were no vascular lesions.

Microscopic Examination.

In technique of preparation of sections and the method of recording the findings in the different areas and layers have been sufficiently described in the above-mentioned paper on the "Dissociation of Neuronic and Neuroglia Changes." For the purposes of this work we have omitted consideration of such microscopic lesions as in our opinion might be rather immediately due to agonal or very recent processes. Thus, we have abstracted from our notes references to the existence of axonal reactions and chromatolysis, to say nothing of certain tendencies to diffuse or poor staining in certain loci that are extremely hard to interpret (especially in view of the fact that the same section in adjacent layers under identical tinctorial conditions exhibit relatively perfect staining capacities).

The three major queries appear to relate to nerve cell losses, neuroglia proliferation, and perhaps nerve cell shrinkage; although to the latter process (in view of artifacts of fixation and preparation) we attach less significance.

As to Case I (10.9), we may recall that this case showed the least degree of nerve cell loss. In fact, we found in 224 loci (layers in different areas) only 55 instances of nerve cell loss; that is to say, if we take a layer in a gyrus as a locus, but 55 of such loci exhibited nerve cell losses among 224 examined.

This proportion was the lowest in the whole series, although the patient was fifty-six years of age and had had at least fourteen years of pronounced symptoms. Moreover, the amount of gliosis demonstrable in this case was comparatively low, since but 19 of the 224 loci examined showed gliosis, whether of the satellite-cell type or of other types. This case was, in short, our most nearly normal case; at the same time, the case with the longest duration. There is in point of fact a question whether the earliest symptoms should not be put back to forty, at which time, symptoms designated "congestion of brain" appeared. It is clear that the distribution of lesions in the different loci may be of particular interest in such a case.

Before proceeding to this analysis, let us briefly summarize the general situation in the other three cases.

Case II (12.41) is a case with somewhat numerous cell losses estimated in the above-mentioned manner. There were, namely, 91 loci of nerve cell loss among 208 examined, or 43 per cent., and there were 11 per cent. loci having evidences of gliosis. It is this type of case, where the neuroglia proliferation to some extent follows the degree of nerve cell loss, that yields the general impression to the pathologist that gliosis is a reaction of the nerve tissues in the endeavor to replace lost elements. Of course, this parallelism of gliosis to parenchymatous loss may be proved eventually to exemplify the general law as formulated by Weigert. Still the examples afforded by III and IV look in another direction.

Case III (12.47) was of particular interest because it showed the fewest examples of loci exhibiting gliosis, namely, seven examples in 232 loci examined. This case was used in our study of the dissociation of parenchymatous and interstitial lesions to illustrate the extremest degree of such dissociation, since, in strong contrast to the 3 per cent. gliotic loci, there were 53 per cent. of loci with nerve cell loss, namely, 123 loci of 232 examined. Of course, the general pathological situation exhibited by this case is altered by the fact that its assigned duration is but two years and death occurred at twenty-seven. It might be queried whether so young a case could show extensive gliosis such as is frequently found in older cases.

Case IV (11.36) shows a tendency to the same contrast, since there were but 7 per cent. gliotic loci (12 in 152) as against 43 per cent. of nerve cell loss (36 in 152). This case was also approximately two years in duration, with death at thirty-one.

Having thus reviewed the general histological status of the cerebral cortex in these four cases with respect to gliosis and nerve cell loss, let us proceed to examine the distribution of lesions. We shall begin with the stratigraphical distribution. The impression which had been obtained from the less systematic studies of a few sample areas from the fifty cases of dementia præcox presented in 1910 and 1914 from the Danvers laboratory was confirmed by this study, namely, that too much emphasis may easily be placed on the suprastellate and infrastellate distributions of nerve cell losses and gliosis.

As for Case I (10.9), our case with the least evidence of nerve cell loss, the majority of the losses demonstrable appear to be in the sixth layer, or that immediately infrastellate layer which, as a rule, contains large pyramidal cells. The greater degrees of cell loss were, in point of fact, found in but four areas in this infrastellate region, namely, in the postcentral, parietal, angular gyrus and superior temporal regions. There are no losses demonstrable forward of the fissure of Rolando, so far as yet examined, except in the left area of Broca. There are approximately as many lesions in the suprastellate regions as in the infrastellate regions. The suprastellate lesions are far more scattering, however, a few corresponding to the regions of greatest infrastellate lesion just enumerated, and a few in the insula, gyrus rectus, and the pyriformis regions. One gets the impression from these data that the agency responsible for these cell losses acted chiefly over an area of adjacent gyri on each side; for example, the postcentral, superior parietal and angular gyri; and although one would have to traverse the fissure of Rolando in one case and the fissure of Sylvius in the other, it might be pointed out that all the infrastellate cell losses so far determined occur in a single sheet of tissue, since the areas just mentioned are closely adjacent to the areas of Broca and superior temporal gyri. However, in the event that such a proof could be brought, namely, that the infrastellate region in a fairly continuous sheet over the flank of the brain was affected, yet the pathology of the affection must face the fact that similar degrees of lesion affect the co-ordinate parts of the brain, so that a certain bilateral symmetry is suggested.

As for the suprastellate instances of cell loss, these cannot be considered to occur in a single sheet. In the first place, they affect at least three different suprastellate layers as well as the stellate layer itself. These lesions do not appear to be as

symmetrical in their general disposition as in the infrastellate lesions. So far as may be told, these lesions are entirely capricious in their situation. Quantitatively there were but two of six suprastellate lesions that were striking in degree.

Kraepelin makes much of the fact which he alleges, namely, that the upper layers of small cells are those most affected with nerve cell losses. He points out that in long-standing cases the second and third layers of the cortex should show the most marked lesions. Comparative anatomy teaches that the small cell layers of the suprastellate region correspond with the highest degrees of mental development obtaining in man; for example, there must be marked development in the frontal region. Kraepelin is tempted to regard these areas as the vehicle for the process of abstraction which translates perceptions into general concepts, turns the lower feelings into higher ones, and turns impulses into volitional conduct. In short, what Kraepelin terms the nucleus of the mental personality is dependent upon such processes of abstraction, and consequently upon the existence and operations of these suprastellate layers. It would appear that many other authors would in general agree with this trend of Kraepelinian analysis; similar or identical considerations may be found in several other authors. It is not overbold to assert, according to Kraepelin, that in dementia præcox the loss of the abstractive power of the mind, so characteristic of the scattered thinking, mutable emotionality and impulsivity, is to be explained on the basis of this disturbance in the suprastellate layers.

Kraepelin also suspects that these suprastellate layers have another function in addition to that of abstraction. These layers, namely, should have the task of the general combination of the activities of the deeper layers. The activities of the deeper layers need such combination inasmuch as they are in all probability more closely related to circumscribed objects, such as sense-perception and impulses to movement. The actual elaboration of external experience and the unifying of this experience with that of the past, as well as the power of critique exerted on the basis of the standards of past experience, prove to be a function of these outer layers. These outer layers may, in short, prove to be the basis for inner unity and orderliness of the mental life. It is a disturbance of this unity and orderliness of the mental life which is the fundamental disorder in dementia præcox. Kraepelin goes on to point out that in these cases there is no tendency to an extensive injury of the deeper layers; and

he points out that dementia præcox patients preserve relatively well their powers of sensory intake and powers of recollection of perceptions as well as the products of education. The phylogenetic inheritance of men is relatively well preserved in dementia præcox. It is rather the higher mental faculties that are injured.

Of course, dementia præcox patients do preserve their capacity to perform a good many habitual complex acts. Their memory of such acts is normal. To explain this situation, Kraepelin points out that the actual seat of sensory and mechanical memories is to be looked for in the deeper layers rather than in the suprastellate layers. In fact, the memories preserved by the patient may permit him to conceal to a certain degree the destruction of his higher faculties so long as activities not requiring independence are going on. A good many common constellations of ideas and commonplaces of thought are well preserved. As soon as any adaptation of emotions and action is required to particular circumstances, then the deficiencies of the dementia præcox patient become transparent. It is on this account, thinks Kraepelin, that the clinical disorders that we see early in dementia præcox are rather more strikingly shown in the field of emotion and will than in the intellectual field. The intellectual field seems intact for a long time on account of the preservation of these commonplaces of thinking and phrase making, of which so much of life is compounded. Grant the destruction of the unifying forces of the personality, then come into play the instinctive or lower volitional tendencies which are normally suppressed. Thus, Kraepelin characterizes such phenomena as mechanical obedience and the characteristic (non-ideogenic) negativism of dementia præcox, as well as the stereotypes and even the mannerisms and purposeless acts of certain cases. Neologisms and other characteristic speech disorders in dementia præcox are also due to a loosening of association between ideas, sounds and movements, as well as to a faulty execution of speech formulæ.

It cannot be denied that such speculations are extremely attractive, and that the data of comparative anatomy lend firm support to some sort of generalization along these lines. A number of obvious objections spring to mind, as to the details of Kraepelin's suggestive formulation, which may itself be regarded as largely based on Alzheimer's findings. Our own Case I (10.9), in point of fact, seems to be an exception to the rule. In one sense the disease may be regarded as a psychopathic jealousy of

great duration and a certain tendency to elaboration, although without anything which could be called systematization. The delusional complex was by no means limited to the patient's husband or near relatives, but eventually dealt with beliefs concerning various people coming to kill her. It may be that our histology has nothing at all to do with these delusions, which were elaborated and multiplied from a quasi natural belief in the husband's jealousy. We are, at any rate, not willing to regard the scattering evidence of suprastellate lesion as sufficient basis for a hypothesis concerning loss of abstractive power on the part of this patient.

It must be remembered that Case I developed auditory hallucinations at the age of fifty-five, standing, listening at keyholes and shouting to imaginary persons. She later became resistive to passive movements, exhibited cerea flexibilitas, and retained constrained peculiar attitudes. It would seem that our infrastellate lesions are well placed from the topographical standpoint to account for such hallucinosis, resistivism and catatonia (temporal, postcentral and parietal regions). So far as catatonia is concerned, and possibly also hallucinosis, one is often tempted to think that these symptoms are rather more irritative than destructive in the sense of Hughlings Jackson. As for hallucinosis, its occurrence in alcoholic conditions, where curable fatty changes may be suspected to exist, indicates their "irritative" nature. The situation with catatonia is more complex. However, the association of catatonia with stupor gives rise to the idea that the lesions or conditions subtending catatonia ought to be infrastellate rather than suprastellate. If schizophrenia is a suprastellate effect, then catatonia might well be an infrastellate process. However that may be, it would seem that the stratigraphical situation of the lesions in this case is suggested. The topographical situation of the lesions is entirely consistent with the hallucinosis and perhaps also with the catatonia (if former contentions concerning the post-Rolandic site of processes subtending catatonia be upheld).

So far, then, we find in our analysis of Case I that our infrastellate lesions are grouped chiefly in a sheet of continuous tissue in the two flanks of the brain, in and about the angle made by the fissure of Rolando with the fissure of Sylvius, whereas we find the suprastellate lesions apparently entirely capricious in their site. We find no particular correlation for the jealousy delusions of this case, which, for that matter, did not show

special evidence of schizophrenia, but rather of a more and more synthetic power of including other new persons in the delusional complex. Unless hallucinosis and catatonia, or the mere fact of delusions, is to be taken as necessarily schizophrenic in their nature, we should hardly be able to discover a characteristic schizophrenia in the case. In brief, the personality of the case was relatively well preserved, and remained so to a very late phase: an eventual phase of hallucinosis and catatonia. May we perhaps draw from this case the conception that in the absence of demonstrable dissociative or schizophrenic processes, there may be no need of asserting the probability of supra-stellate lesions? It might be inquired, finally, whether the evidences of satellitosis, also not numerous, have any bearing on the microlocalization of these symptoms. There is a general tendency to satellitosis in the areas above mentioned as characterized by nerve cell losses in the region below the stellate zone. There are scattering evidences of satellitosis elsewhere. The most striking evidences were found in the external layer of large pyramids in the right superior temporal gyrus. It does not appear that these distributions are particularly suggestive in functional analysis. They hardly parallel the nerve cell losses since the satellitosis is in almost every instance found to the greatest extent in loci themselves not characterized by nerve cell losses.

If we now turn to Case II (12.41), the case with numerous cell losses and the highest amount of gliosis which we have found in our series, we are in point of fact almost embarrassed by riches, since a degree of cell loss is to be found in practically all layers examined, although the prefrontals and occipitals, and certain other areas, show less evidence of nerve cell loss. An endeavor was made to register roughly the amount of cell loss in these loci. If we try to correlate the greatest amounts of cell loss with the loci, we discover that the cell losses are in this case, also, in the infrastellate region; for instance, in the left precentral and right transverse temporal regions. Although not approaching these extreme degrees, marked cell losses are found in numerous other infrastellate layers; for example, on the left side, stretching from the precentral, through the postcentral, the superior parietal, the angular, to the superior, transverse and middle temporal areas. In a sense, therefore, we have a similar distribution to that of Case I, although on the whole the losses seem to be more in the fusiform layer immediately adjacent to the white matter than in the layer characterized in many areas by large pyramidal

cells. On the right side the cell losses are similarly placed both in the fusiform and in the internal large pyramid layers, but they appear to be less continuous with one another. If, now, we examine the stellate and suprastellate layers, we discover more or less marked cell losses, stretching back on the left side from the superior frontal, through the precentral and postcentral, but not so largely affecting the postcentral, and not especially in evidence in the parietal and angular gyrus regions. However, the transverse superior and middle temporal gyri are somewhat strongly affected, as well as the Broca area. The occipital areas, as above stated, show comparatively few lesions. As in the infrastellate region, the suprastellate region of the right side shows less continuity in the occurrence of cell losses. Both gyri recti seem to exhibit considerable cell loss in the suprastellate region, as against a slighter development of such losses in the infrastellate region.

Corresponding with the cell losses of the suprastellate region, we find evidence of cellular gliosis in the plexiform and small pyramid layers, and we find inside the cortex a considerable display of satellitosis, especially in the fusiform layer but also in occasional layers elsewhere. One particular gyrus, the right middle temporal, showed remarkable degrees of satellitosis throughout the stellate and suprastellate layers, whereas there was almost total absence of such satellitosis in the suprastellate region of the adjacent superior temporal gyrus and in the transverse temporal gyrus.

The clinical analysis of this case also seems to show an erotic element, like that of the previous case. It will be remembered that this case was the mother of an illegitimate child in her teens, led a reasonably normal life thereafter, underwent a religious change of character in the twenties, renounced her lover, and became extremely religious, externally speaking; and that in the fifties she became deluded concerning her pastor. Auditory hallucinations were never proved to exist in this case. As for statements that black hands were seen, as well as a cat jumping over a pitcher, it is a question whether these phenomena were not dreams. It is doubtful whether there was any catatonia in the case. It is a question whether there was any true parathymia, or whether the lability of emotions did not run practically parallel with the patient's persecutory ideas. It would not be impossible to deny altogether that the case is a characteristic one of dementia præcox; at all events, if we insist upon demonstrable schizophrenia for a diagnosis of this disease.

Despite the comparatively slight degree of gliosis and satellitosis, we may perhaps regard the somewhat diffuse cell losses as somehow due to old age, and may perhaps align them with the hair on the patient's upper lip, the arcus senilis, prominent deep-set eyeballs, rapid heart and the like. At all events, there seems to be nothing characteristic about the stratigraphical or topographical distribution of the cell losses found. Perhaps we are here dealing with a more globar and diffuse disorder of personality than that which we think of in schizophrenia. At all events, it would not appear that the data of this case are of service in evaluating the speculations of Kraepelin concerning the differential importance of stratigraphical lesions.

If we turn to Case III, we have to deal with that case which showed the least neuroglia change and the most nerve cell losses. What little satellitosis occurred in the case was infrastellate, affecting both prefrontal regions and the left superior parietal region. If we examine the distribution of cell losses, we find them in no instance so numerous as some in Case II. The most extensive losses appear to be those in the angular gyri of both sides, both infrastellate and suprastellate, and the two superior temporal gyri are almost as seriously affected. Hardly an area escapes cell losses somewhere in the suprastellate region. On the whole, a good many areas escape evidence of cell loss in the infrastellate region. There is apparently in this case somewhat more tendency to the sort of thing observed by Alzheimer than in previous cases. This case appears to have been characteristically catatonic, and at times showed cerea flexibilitas, and was at times in a stupor. There was considerable contention whether the patient had auditory hallucinations. It would appear that the patient was at least somewhat schizophrenic, although there is less evidence of an intellectual schizophrenia as opposed to catatonia than might be wished. An early period looking like manic-depressive psychosis and occasional almost normal intervals complicate analysis. At all events, it would seem that a pretty well marked case of dementia præcox of something like two years' duration fails to show special evidence of satellitosis; and if we are to suppose that catatonia and stupor are in some sense irritative symptoms, we do not find anything to bear out this idea in the histology; in fact, if we can correlate our histology with the catatonia at all, we might rather think of this process as due to nerve cell losses; of catatonia, in short, rather as a phenomenon of dissociation than of overirritation of particular mechanisms. We regard this case, accordingly, as some-

what equivocal in the discussion of the relation of stratigraphical and topographical lesions to dementia præcox.

There is one case remaining, Case IV (11.36). Unfortunately, there is a question whether this case is one of dementia præcox at all, although on the whole we regarded her indifference, persistent slight silliness, impulsivity, and auditory hallucinosis, as consistent with the diagnosis. Here, again, the lesions are both suprastellate and infrastellate. There is but one area which has marked satellitosis, namely, the right superior parietal area; the left superior parietal area shows far less, although more than adjacent areas. There is little or no cellular gliosis in the case except, curiously enough, in the occipital areas, which are as a rule spared from lesions in these cases. The post-Rolandic regions are in general free from lesions, although scattering degrees of cell loss are found in a few loci. The most marked lesions in this case appear to be in the two superior frontal regions, as well as in the left precentral. On the whole, this case shows about as much evidence of cell loss in the infrastellate as in the suprastellate layers. Whether we can attribute the silliness and impulsivity to frontal lesions is doubtful.

Alzheimer emphasizes a process termed sclerotizing of nerve cells as a feature in dementia præcox cortices, and Kraepelin has followed Alzheimer in presenting plates of such change in his description of the histology of dementia præcox from which we have been abstracting. We have, consequently, thought it worth while to examine our preparations for such processes. The shrinkage changes are, on the whole, not much in evidence in our preparations. In Case I (10.9), the case, we remember, in which the least nerve cell loss was demonstrable, there are eleven loci of shrinkage, involving eight cortical areas, with repetition on both sides of the brain, and with about equal distribution in suprastellate and infrastellate zones. It is rather interesting to observe that these shrinkage changes do not occur characteristically in loci characterized by cell loss. The association of shrunken cells with loci relatively bare of cells is not characteristic.

Case II (12.41), although it exhibits far more evidence of cell loss, exhibits but slightly more shrinkage changes, namely, 14 loci involving 11 areas. Here, again, the loci with shrinkage changes are rather apt to be loci without evidences of cell loss. The impression gained from these findings is, that if the shrinkage process is a genuinely ante-mortem one, and not merely an artifact, then the process of the nerve cell loss is practically at a stand-

still in the loci where cell loss is found, and the shrinkage changes are proceeding in nerve cells in loci that have not been subject to cell loss. If this conclusion were sound, as indicated by Cases I and II, we might think of a rather uneven progress of disease from locus to locus, with relative completion of the process in a given locus before another is attacked. Case II likewise shows example of shrinkage change in both infrastellate and suprastellate layers.

Case III (12.47), the case which showed the maximum percentage of local cell losses and the minimum percentage of neuroglia cell proliferations, shows 15 instances of local cell shrinkage in 11 areas, both suprastellate and infrastellate, although more frequently affecting the former. Here, again, the shrinkage changes occur rather in areas free from pronounced nerve cell loss than in areas with such cell loss.

Case IV (11.36) shows but five instances of cell shrinkage, again both suprastellate and infrastellate in distribution, and as a rule not associated with nerve cell loss.

Accordingly, we perceive that all the cases concur in the distribution of shrinkage changes and in their elective situation *in loci without much evidence of cell loss*. We are not inclined to attach too much significance to these shrinkage changes, and for our part are unable to evaluate them as to their ante-mortem or post-mortem character. It would seem that if cell loss is preceded by shrinkage changes, there should be a good deal more evidence of shrinkage changes in the nerve cells throughout these four brains. The question then arises, whether the process of cell loss is not a different one. Such a change might proceed in the manner of a gradual disappearance, in which case there would be cell shadows and similar phenomena in all grades of hypochromatia. We have not seen good evidence of this process in these sections. We have, however, seen a good deal of the so-called axonal reaction, or the changes closely similar thereto.

The analysis of the distribution of these axonal reactions, or analogous changes, leaves us in a somewhat similar plight as did the analysis of the distribution of the shrinkage changes, for axonal reactions are not often found in loci where there is evidence of cell loss. There are, for example, in Case I (10.9) 28 instances of axonal reaction, the majority of which are suprastellate in rather more instances in the fusiform layer adjacent to the white matter than elsewhere. Case II (12.41) exhibits 11 instances, all distributed in loci without evidence of cell loss. Case III (12.47) yields 21 instances of axonal reaction, of which

but six are associated with degrees of cell loss, and in only one of these with any marked degree of cell loss. As in Case I, there is a tendency to the occurrence of these changes in the fusiform layer,— 11 instances. An occasional gyrus — for example, the left pyriformis — yields examples in four layers, though for the most part the reactions are not generally distributed. Case IV (11.36) yields 11 instances of axonal reaction, again distributed in areas without cell loss.

As a rule, one thinks of these axonal reactions as due to some injury of the appended nerve fiber, and one thinks of these changes in non-traumatic cases as incidental to a central neuritic process, perhaps of toxic origin. If so, there is no extreme tendency to universality of the lesions, such as one might think appropriate to febrile or toxic changes. It is of note that the majority of cases showed no axonal reactions in the cells that are best suited to the demonstration, namely, the large Betz cells of the precentral region, as this change occurred in but two of the eight precentral regions examined.

It remains to inquire how much relation there is between cell loss and satellitosis, since it may be conceived that there is some active or malignant process on the part of the cells, which either actively act in the destruction of the cells, or aid in their destruction. Concerning satellitosis, it may be remarked that the majority of instances (Case I, 8; Case II, 7; Case IV, 3 instances) occur in the fusiform layer. Case III, to be sure, has but one instance, but there are only four loci in this case that show satellitosis at all. The satellitosis is in association characteristically with none of the lesions, being very occasionally associated with cell shrinkage, with axonal reaction, and with cell loss. One of the most marked instances of satellitosis occurring in all the pyramidal layers and the stellate layer is to be found in the right midtemporal region,— Case II (12.41),— but there is no evidence of cell loss in these stellate and suprastellate regions; and although there is some evidence of cell loss in the layer of internal large pyramids, there is no satellitosis in these infrastellate layers in this area. Another area, the right superior parietal area of Case IV (11.36) shows five instances of satellitosis in all layers except the layer of small pyramids, but without correlation with cell loss. It would appear, therefore, that satellitosis is a process which occurs, as it were, in showers in certain gyri at a time when it does not appear in other gyri. It is a process characteristically associated neither with shrinkage nor with cell loss.

As to the meaning of these different disease processes in and about nerve cells, it would appear that no one has ever considered axonal reactions as at all characteristic of catatonia or dementia præcox. Such reactions on the part of cells are regarded as intercurrent or adventitious. We have ourselves no reason to suppose that they represent anything important in the brains of these cases so far as an interpretation of the mental symptoms is concerned.

As to satellitosis, this process will always be remembered as the one that Alzheimer described as occurring in the deeper layers of certain cases of catatonia. We find (except in Case III, which was a case which showed very little neuroglia reaction of any sort) that the satellitosis is beyond question rather frequently found in the deeper layers, and particularly in the fusiform layers. Although similarly exact studies have not been made of other diseases, it is our general impression that this elective situation of satellitosis holds for a variety of other diseases as well. In these relatively long standing cases of mental disease, satellitosis is not unusually prominent. The question arises whether satellitosis has not occurred in many areas and then disappeared. As to the length of life of the satellite cells, perhaps nothing can be definitely said at this time. Satellitosis, as above remarked, does, however, occur in certain gyri when it is absent from all others. If this finding is substantiated in future, we may have a basis for ascribing a remarkable focality of disease process to certain cases.

Summary and Conclusions.

The writers present an analysis, chiefly stratigraphical, of certain lesions, notably nerve cell loss and gliosis (including satellitosis) in four cases of dementia præcox. These cases were cases which showed no gross aplasia, sclerosis or atrophy in the gross and yet exhibited symptoms of two years' or greater duration, entitling them to be considered in the dementia præcox group.

In connection with this work, a review of Kraepelin's estimate of structural work in dementia præcox brains is offered, and the stratigraphical data are presented in relation to Kraepelin's views as to the functions of suprastellate and infrastellate layers.

Absence of suprastellate lesions in a case of the paranoic or paraphrenic group was noted, but there was no special evidence of schizophrenia in this case as clinically viewed; the case did

show infrastellate lesions in areas contiguous with one another in the two flanks of the brain. It might be possible to correlate the late catatonia and late hallucinosis in the case with these infrastellate lesions. Other cases possibly more typical of dementia præcox exhibited lesions both in the suprastellate and infrastellate regions, sometimes numerous, sometimes isolated and apparently capricious in distribution. No good example of lesions chiefly limited to the suprastellate layers has been found.

Gliosis and satellitosis do not follow the nerve cell losses. The same holds true of shrinkage changes and axonal reactions. Nor is satellitosis closely associated either with shrinkage changes (which are not numerous in this series) or with axonal reactions. The dissociation of parenchymatous (neuronic) and interstitial (neuroglia) changes reported in a previous communication is further emphasized.

REFERENCES.

1. Kraepelin: "Psychiatrie," 3d volume, 1913.
2. Bleuler: "Dementia Præcox" (Handbuch der Psychiatrie, Aschaffenburg, IV, Abt. I), 1911.
3. Meyer, Hoch & Jelliffe: "Dementia Præcox," 1911.
4. Southard, E. E.: "A Study of the Dementia Præcox Group in the Light of Certain Cases showing Anomalies or Scleroses in Particular Brain-Regions." Proceedings of American Medico-Psychological Association, May, 1910.
5. Southard, E. E.: "On the Topographical Distribution of Cortex Lesions and Anomalies in Dementia Præcox, with Some Account of their Functional Significance." American Journal of Insanity, Vol. LXXI, No. 3, January, 1915, pp. 603–671.
6. Southard, E. E.: "A Comparison of the Mental Symptoms found in Cases of General Paresis with and without Coarse Brain Atrophy." Journal of Nervous and Mental Disease, Vol. 43, No. 3, March, 1916, pp. 204-216.
7. Morse, M. E.: "Thalamic Gliosis in Dementia Præcox." American Journal of Insanity, Vol. LXXII, No. 1, July, 1915.
8. Southard, E. E.: "On the Dissociation of Parenchymatous (neuronic) and Interstitial (neuroglia) Changes in the Brains of Certain Psychopathic Subjects, especially in Dementia Præcox." Transactions of Association of American Physicians, 1916.
9. Orton, S. T.: "A Study of Satellite Cells in Fifty Selected Cases of Mental Disease." Brain, 1914.
10. Cotton, H. A.: "Fatty Degeneration of the Cerebral Cortex in the Psychoses, with Special Reference to Dementia Præcox." Journal of Experimental Medicine, Vol. 22, 1915.

LEGISLATION AND ADMINISTRATION.

CHAPTER 46, GENERAL.

AN ACT RELATIVE TO THE COMMITMENT OF PERSONS UNDER INDICTMENT TO STATE INSANE HOSPITALS AND TO THE REMOVAL OF INSANE PRISONERS.

Be it enacted, etc., as follows:

SECTION 1. Section one hundred and three of chapter five hundred and four of the acts of the year nineteen hundred and nine is hereby amended by striking out the last sentence and inserting in place thereof the following: — If a prisoner so removed is, in the opinion of the trustees and superintendent, restored to sanity, they shall so certify upon the commitment, and notice, accompanied by a written statement regarding the mental condition of the prisoner, shall be given to the keeper of the jail or the person having custody of him at the time of the removal, who shall thereupon cause the prisoner to be reconveyed to the jail or custody from which he was removed, where he shall be held in accordance with the terms or process by which he was originally committed or confined,— so as to read as follows: — *Section 103.* If a person under complaint or indictment for any crime, is, at the time appointed for trial or sentence, or at any time prior thereto, found by the court to be insane or in such mental condition that his commitment to a hospital for the insane is necessary for the proper care or observation of such person pending the determination of his insanity, the court may commit him to a state hospital for the insane under such limitations as it may order. The court may in its discretion employ one or more experts in insanity, or other physicians qualified as provided in section thirty-two, to examine the defendant, and all reasonable expenses incurred shall be audited and paid as in the case of other court expenses. A copy of the complaint or indictment and of the medical certificates attested by the clerk shall be delivered with such person in accordance with the provisions of the said section. If a prisoner so removed is, in the opinion of the trustees and superintendent, restored to sanity, they shall so certify upon the commitment, and notice, accompanied by a written statement regarding the mental condition of the prisoner, shall be given to the keeper of the jail or the person having custody of him at the time of the removal, who shall thereupon cause the prisoner to be reconveyed to the jail or custody from which he was removed, where he shall be held in accordance with the terms or process by which he was originally committed or confined.

SECTION 2. Section one hundred and six of said chapter five hundred and four, as amended by section one of chapter one hundred and twenty-two of the acts of the year nineteen hundred and ten, is hereby further amended by striking out the last sentence and inserting in place thereof the following: — If a prisoner so removed is, in the opinion of the trustees and superintendent of the hospital, restored to sanity, they shall so certify upon the commitment, and notice, accompanied by a written statement regarding the mental condition of the prisoner, shall be given to the jailor, master or superintendent of the jail, house of correction or prison, who shall thereupon cause the prisoner to be reconveyed to the jail, house of correction or prison, there to remain pursuant to the original sentence, computing the time of his detention or confinement in the hospital as a part of the time of his imprisonment,— so as to read as follows: — *Section 106.* If a prisoner under sentence in a jail, house of correction, or prison other than those named in the preceding section, appears to be insane, the physician in attendance shall make a report thereof to the jailor or master who shall transmit the same to one of the judges mentioned in section twenty-nine. If the judge finds in accordance with the provisions of sections eleven, twenty-nine and thirty that the prisoner is insane and that his removal is expedient, he shall order the removal of such prisoner, if a male to the Bridgewater State Hospital, if a female to one of the other state hospitals for the insane, pursuant to the provisions of said sections: *provided*, that if a male prisoner has not been criminal and vicious in his life the judge may order him removed to one of the other state hospitals for the insane. A physician, other than the physician in attendance at the place of detention, making the certificate, shall be entitled to the compensation provided by section forty-eight. If a prisoner so removed is, in the opinion of the trustees and superintendent of the hospital, restored to sanity, they shall so certify upon the commitment, and notice, accompanied by a written statement regarding the mental condition of the prisoner, shall be given to the jailor, master or superintendent of the jail, house of correction or prison, who shall thereupon cause the prisoner to be reconveyed to the jail, house of correction or prison, there to remain pursuant to the original sentence, computing the time of his detention or confinement in the hospital as a part of the time of his imprisonment.

SECTION 3. This act shall take effect upon its passage. [*Approved March 8, 1917.*

CHAPTER 48. GENERAL.

AN ACT RELATIVE TO TEMPORARY ABSENCE BY PERMISSION FROM INSTITUTIONS UNDER THE SUPERVISION OF THE COMMISSION ON MENTAL DISEASES.

Be it enacted, etc., as follows:

SECTION 1. Section seventy-five of chapter five hundred and four of the acts of the year nineteen hundred and nine, as extended by chapter two hundred and thirty-nine of the General Acts of the year nineteen hun-

dred and sixteen, is hereby amended by striking out the word "six", where it occurs in the fifth and nineteenth lines, and inserting in place thereof the word: —twelve,— so as to read as follows: — *Section 75.* The superintendent or manager of any hospital or receptacle described in section seven may permit any inmate thereof temporarily to leave such institution in charge of his guardian, relatives, friends, or by himself, for a period not exceeding twelve months, and may receive him when returned by any such guardian, relative, friend, or upon his own application, within such period, without any further order of commitment. The superintendent may require as a condition of such leave of absence, that the person in whose charge the patient is permitted to leave the institution shall make reports to him of the patient's condition. Any such superintendent, guardian, relative or friend may terminate such leave of absence at any time and authorize the arrest and return of the patient. The officers mentioned in section eighty-six shall cause such a patient to be arrested and returned upon the request of any such superintendent, guardian, relative or friend. Any patient who has not returned to the institution at the expiration of twelve months shall be deemed to be discharged therefrom.

SECTION 2. This act shall take effect upon its passage. [*Approved March 8, 1917.*

CHAPTER 50, GENERAL.

AN ACT TO PROVIDE FOR THE INSTRUCTION OF NURSES, ATTENDANTS AND PATIENTS IN CERTAIN STATE INSTITUTIONS.

Be it enacted, etc., as follows:

SECTION 1. Section one of chapter six hundred and forty-nine of the acts of the year nineteen hundred and eleven is hereby amended by striking out the said section, and inserting in place thereof the following: — *Section 1.* The trustees of the state institutions under supervision of the commission on mental diseases shall cause to be given to the nurses, attendants and patients of said institutions instruction in such arts, crafts, manual training, kindergarten and other branches and lines of occupation as may be appropriate for the patients of the said institutions to undertake, especially such patients as are physically unfit to perform the usual work in or about the institutions.

SECTION 2. This act shall take effect upon its passage. [*Approved March 8, 1917.*

CHAPTER 69, GENERAL.

AN ACT RELATIVE TO THE COMMITMENT OF DIPSOMANIACS AND OTHERS.

Be it enacted, etc., as follows:

SECTION 1. Section fifty of chapter five hundred and four of the acts of the year nineteen hundred and nine, as amended by chapter five hundred and fifty-eight of the acts of the year nineteen hundred and fourteen, and by chapter seventy-three of the General Acts of the year nineteen hundred

and fifteen, is hereby further amended by striking out the said section and inserting in place thereof the following:— *Section 50.* Any of the judges named in section twenty-nine, and the justices of the municipal court of the city of Boston, may commit to the Norfolk state hospital, the McLean hospital or to a private licensed hospital or house, any male, or to any hospital or licensed receptacle for the insane, public or private, except the Norfolk state hospital, any female, who is subject to dipsomania or inebriety either in public or private, or who is so addicted to the intemperate use of narcotics or stimulants as to have lost the power of self-control; but no such commitment shall be made until satisfactory evidence is presented to the judge by whom the proceedings are heard that such person is not of bad repute or of bad character apart from such habits of intemperance. The magistrate who receives the application for such commitment shall examine on oath the applicant and all other witnesses, shall reduce the application to writing and cause it to be subscribed and sworn to by the applicant. He shall cause a summons and copy of the application to be served upon such person in the manner provided by section twenty-five of chapter two hundred and seventeen of the Revised Laws. Such person shall be entitled to a hearing, unless after receiving said summons he shall in writing waive a hearing; and in that case the magistrate may issue an order for his immediate commitment as aforesaid, without a hearing, if he is of opinion that such person is a proper subject for treatment and custody in the hospital or other place to which he is committed. The commitment may be made forthwith, if the examining physician certifies the case to be one of emergency. A person committed as aforesaid may be detained for two years from the date of his commitment, and no longer.

SECTION 2. This act shall take effect upon its passage. [*Approved March 14, 1917.*

CHAPTER 115, GENERAL.

AN ACT TO PROVIDE FOR THE DEVELOPMENT AND STATEWIDE EXTENSION OF THE PSYCHOPATHIC HOSPITAL SERVICE.

Be it enacted, etc., as follows:

SECTION 1. The commission on mental diseases is hereby authorized to develop, extend and complete a statewide system of psychopathic hospital service by establishing new hospital and outpatient units in suitable districts in connection with existing or future state hospitals under the supervision of said commission. The administration of the separate new district units and the appropriations granted therefor shall be in accordance with laws governing the state hospitals to which the land, buildings and furnishing of said units shall appertain. The direction of the scientific work in the proposed new units, together with that of the psychopathic department of the Boston state hospital already established under the provisions of chapter four hundred and seventy of the acts of the year nineteen hundred

and nine, shall be vested in the commission on mental diseases by means of its duly appointed agents, and said commission shall provide, out of the appropriation for the department, for the salaries and wages of directing and investigative officers and employees and for the expenses of investigation of the nature, causes, treatment and results of mental disease and defect.

SECTION 2. This act shall take effect upon its passage. [*Approved March 29, 1917.*

CHAPTER 131, GENERAL.

AN ACT TO AUTHORIZE THE COMMISSION ON MENTAL DISEASES TO PROVIDE FOR THE INTERSTATE TRANSFER OF INDIGENT INSANE PERSONS.

Be it enacted, etc., as follows:

SECTION 1. Chapter five hundred and four of the acts of the year nineteen hundred and nine, as amended in section sixty-nine, by section one of chapter three hundred and thirty-four of the acts of the year nineteen hundred and eleven, is hereby further amended by striking out the said section sixty-nine, and inserting in place thereof the following: — *Section 69.* The commission on mental diseases may, subject to the provisions of section seventy, transfer to and from any institution or receptacle under its supervision, any inmate thereof who, in the opinion of the commission, is a proper subject for admission to the institution or receptacle to which he is to be transferred: *provided*, that no such inmate shall be transferred to be detained as an insane person unless he shall have been duly committed as insane by a judge or court; and *provided, further*, that no person shall so be transferred to the Bridgewater state hospital unless he has been a criminal and vicious in his life. A record of such transfer shall be entered in the registers of the institutions to and from which he is transferred. The commitment papers, together with an abstract of his hospital case-record, shall be transmitted with him to the institution to which he is transferred. The commission may also remove any pauper inmates of institutions under its supervision, who are not subject to the orders of a court, to any country, state or place where they belong. The commission may also enter into an agreement with the corresponding board or commission of any other state for the transfer of indigent insane from one state to the other where they, after a full investigation of all the facts in each case, may be deemed equitably to belong. In making such transfers and removals the commission shall, so far as is practicable, employ nurses or attendants instead of officers of the law, and shall employ female nurses or attendants to accompany female patients.

SECTION 2. This act shall take effect upon its passage. [*Approved April 3, 1917.*

CHAPTER 133, GENERAL.

AN ACT RELATIVE TO THE SUPPORT OF INMATES IN INSTITUTIONS UNDER THE SUPERVISION OF THE COMMISSION ON MENTAL DISEASES.

Be it enacted, etc., as follows:

SECTION 1. Section eighty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine, as amended by section one of chapter two hundred and eight of the General Acts of the year nineteen hundred and fifteen, is hereby further amended by striking out the said section and inserting in place thereof the following: — *Section 82.* The trustees of the institutions mentioned in section fourteen, and of the Massachusetts School for the Feeble-Minded, may, directly or through an authorized agent or agents, make contracts fixing the price for the support of inmates, at a sum not less than six dollars per week, and binding the persons making such contracts to payment thereunder. The price for the support of inmates for whose support such a contract is not made, or of inmates payments for whose support under such contracts are in default, and for insane inmates of the state infirmary and insane inmates of the Bridgewater state hospital, not under orders of a court, shall be determined by the commission on mental diseases at a sum not exceeding six dollars per week for each person, and may be recovered of such persons or of the husband, wife, father, mother, grandfather, grandmother, child or grandchild if of sufficient ability. A married woman shall be subject to the said liability as though sole. Such action shall be brought by the attorney-general in the name of the treasurer and receiver general.

Any person making payment for such support may by suit in equity in the superior court, to which any or all of the classes of persons hereinbefore named may be made parties, regardless of the existence of the marriage relation, recover the same from any person primarily liable for such support, or have the amount so paid apportioned among those who are not primarily liable, in proportion to their ability, respectively, to pay, and may recover such apportionment.

Any guardian or conservator of such an inmate who, having property of his ward in his possession or control exceeding two hundred dollars in value, fails to pay, within three months after receipt of any bill therefor, for his support at the rate determined by the commission on mental diseases shall, upon application of the attorney-general, forthwith be removed.

In all proceedings under this section the sworn statement of a person that he is the superintendent of one of said institutions, or keeps or has custody of the records thereof or of the records of the commission on mental diseases, and that a certain person has been an inmate of said institution during a certain period of time, or that the price of the support of a certain inmate has been determined at a certain sum by the commission on mental diseases, shall be prima facie evidence of the said facts.

SECTION 2. This act shall take effect upon its passage. [*Approved April 3, 1917.*

CHAPTER 223, GENERAL.

AN ACT RELATIVE TO THE COMMITMENT OF FEEBLE-MINDED PERSONS AND THEIR ADMISSION INTO CERTAIN STATE INSTITUTIONS.

Be it enacted, etc., as follows:

SECTION 1. Section sixty-three of chapter five hundred and four of the acts of the year nineteen hundred and nine, as amended by section one of chapter one hundred and twenty-two of the General Acts of the year nineteen hundred and sixteen, is hereby further amended by adding at the end thereof the following: — The order of commitment shall also direct the sheriff, deputy sheriff, constable, police officer, or other person, as the case may be to apprehend and convey the feeble-minded person to the institution to which he has been committed.

SECTION 2. Said chapter five hundred and four, as amended in section sixty-four by section two of said chapter one hundred and twenty-two is hereby further amended by striking out the said section sixty-four and inserting in place thereof the following: — *Section 64.* The trustees of said institutions may, at their discretion, receive any feeble-minded person from this commonwealth upon application being made therefor by the parent or guardian of such person, which application shall be accompanied by the certificate of a physician, qualified as provided in section thirty-two, that such person is deficient in mental ability, and that in the opinion of the physician he is a fit subject for said school. A physician who makes the said certificate shall have examined the alleged feeble-minded person within five days of his signing and making oath to the certificate. The trustees of said institution may also, at their discretion, receive any person from this commonwealth upon the written request of his natural or legal guardian, and may detain him for observation for a period not exceeding thirty days, to determine if he is feeble-minded.

SECTION 3. This act shall take effect upon its passage. [*Approved May 4, 1917.*

CHAPTER 232, GENERAL.

AN ACT RELATIVE TO THE LICENSING OF PRIVATE HOSPITALS AND THE ADMISSION THEREIN OF CERTAIN PATIENTS.

Be it enacted, etc., as follows:

SECTION 1. Chapter two hundred and eighty-five of the General Acts of the year nineteen hundred and sixteen is hereby amended by striking out section six and inserting in place thereof the following: — *Section 6.* The commission may annually license any suitable person to establish or have charge of a hospital or private house for the care and treatment of the insane, epileptic, feeble-minded, and persons addicted to the intemperate use of narcotics or stimulants, and may at any time revoke the license. No such license shall be granted for the care and treatment of insane or epileptic persons unless the said commission is satisfied, after

investigation, that the person applying therefor is a duly qualified physician, as provided in section thirty-two of chapter five hundred and four of the acts of the year nineteen hundred and nine, and has had practical experience in the care and treatment of such patients. No such license shall be granted for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants unless the commission is satisfied, after investigation, that the person applying therefor is a physician who is a graduate of a legally chartered medical school or college; that he has been in the actual practice of medicine for the three years next preceding his application for a license, nor unless his standing, character and professional knowledge of inebriety are satisfactory to the commission. Licenses granted hereunder shall expire with the last day of the calendar year in which they are issued, but may be renewed. The commission shall have power to fix reasonable fees for said licenses and renewals thereof.

SECTION 2. Said chapter two hundred and eighty-five is hereby further amended by striking out section seven and inserting in place thereof the following: — *Section 7.* Whoever keeps or maintains a hospital or private house for the care or treatment of the insane, epileptic, feeble-minded or persons addicted to the intemperate use of narcotics or stimulants, unless the same is in charge of and under the direct personal supervision of, a person duly licensed under this act, shall be guilty of a misdemeanor, and shall be punished by a fine of not more than five hundred dollars.

SECTION 3. The superintendent or manager of any hospital or private house licensed for the care and treatment of persons addicted to the intemperate use of narcotics or stimulants may, when requested by a physician, by a member of the board of health or a police officer of a city or town, by an agent of the institutions registration department of the city of Boston, by a member of the district police, or by the wife, husband, guardian or, in the case of an unmarried person having no guardian, by the next of kin, receive and care for in such hospital, as a patient for a period not exceeding fifteen days, any person who needs immediate care and treatment because he has become so addicted to the intemperate use of narcotics or stimulants that he has lost the power of self-control. Such request for the admission of a patient shall be made in writing and filed at the hospital at the time of his reception, or within twenty-four hours thereafter, together with a statement, in a form prescribed by the commission, giving such information as the commission may deem appropriate. The trustees, superintendent or manager of such hospitals or private houses shall cause to be kept a record, in such form as the commission may require, of each case treated therein, which shall at all times be open to the inspection of the commission and its agents. Such records shall not be a public record, nor shall the same be received as evidence in any legal proceeding. The superintendent or manager of such a hospital shall not detain any person received as above for more than fifteen days, unless, before the expiration of that period, such person shall have been committed under the provisions of section fifty of chapter five hundred and

four of the acts of the year nineteen hundred and nine, as amended by chapter seventy-three of the General Acts of the year nineteen hundred and fifteen, or has signed a request to remain under the provisions of section fifty-four of said chapter five hundred and four. [*Approved May 9, 1917.*

CHANGES IN STAFFS OF STATE INSTITUTIONS FROM AUG. 1, 1916, TO APRIL 1, 1917.

Hospital.	Name.	Date of entering Service.	Date Service terminated.
Worcester,	Dr. George A. MacIver,	–	Aug. 7, 1916
	Dr. Lillian L. MacPhee,	Aug. 2, 1916	Feb. 1, 1917
	Dr. Arthur H. Mountford,	Oct. 31, 1916	–
	Dr. R. Grant Barry,	–	Nov. 1, 1916
	Dr. Harry J. Hagerty,	Dec. 1, 1916	Mar. 31, 1917
	Dr. Clarence A. Bonner,	Dec. 27, 1916	–
	Dr. Harold I. Gosline,	–	Dec. 31, 1916
	Dr. Herbert A. Thompson,	Mar. 1, 1917	–
Taunton,	Dr. Raoul G. Provost,	–	Aug. 18, 1916
	Dr. Francis S. Caldicott,	–	Oct. 1, 1916
	Dr. Thomas J. O'Brien,	Oct. 16, 1916	–
	Dr. Charles E. Roderick,	Nov. 1, 1916	–
Northampton,	Dr. Elisa Kilpatrick,	Aug. 1, 1916	–
	Dr. Eleanor M. Slater,	Mar. 31, 1917	–
Danvers,	Dr. George M. Kline,	–	Aug. 11, 1916
	Mr. Scott Whitcher,	–	Aug. 31, 1916
	Dr. John B. Macdonald,	Sept. 20, 1916	–
	Dr. Frank H. Cushman,	–	Oct. 4, 1916
	Dr. Anna H. Kandib,	Oct. 4, 1916	–
	Dr. Frank H. Leslie,	Oct. 11, 1916	–
	Miss Jean Taylor,	Nov. 4, 1916	–
	Dr. Philip L. Cook,	–	Dec. 31, 1916
	Dr. Nelson G. Trueman,	Jan. 17, 1917	–
	Dr. Lawson G. Lowrey,	–	Feb. 1, 1917
	Dr. William A. Bryan,	April 1, 1917	–
Boston,	Dr. Samuel W. Crittenden,	–	Oct. 9, 1916
	Dr. Eudora W. Faxon,	Jan. 1, 1917	–
	Dr. Geneva Tryon,	–	Mar. 31, 1917
Psychopathic Department, Boston.	Dr. Frankwood E. Williams,	Aug. 1, 1916	Sept. 2, 1916
	Dr. James T. Adams,	Aug. 1, 1916	–
	Dr. Christine M. Leonard,	Aug. 17, 1916	Nov. 18, 1916
	Dr. Joseph Shohan,	Sept. 1, 1916	–
	Dr. Clifford G. Rounsfell,	Sept. 15, 1916	–
	Dr. Herman M. Adler,	–	Sept. 19, 1916
	Dr. Josephine N. Curtis,	Sept. 1916	–
	Dr. Lawson G. Lowrey,	Feb. 1, 1917	–
	Dr. William A. Bryan,	Nov. 1916	Mar. 31, 1917
Grafton,	Dr. George K. Butterfield,	Sept. 4, 1916	–
	Dr. H. Wilbur Smith,	Dec. 24, 1916	–
Medfield,	Dr. Agnes C. Muldoon,	Aug. 14, 1916	–
	Dr. Christine M. Leonard,	–	Aug. 17, 1916
	Dr. John D. Thomas,	Sept. 3, 1916	–
	Dr. Edward French,	–	April 1, 1917
Gardner,	Dr. Marion E. Kenworthy,	–	Feb. 28, 1917
	Dr. DeEtte Brownell,	May 15, 1917	–
Monson,	Dr. Buell L. Ashmore,	Mar. 1, 1917	–
Foxborough,	Dr. Eudora W. Faxon,	–	Dec. 15, 1916
	Dr. Marion E. Kenworthy,	Mar. 1, 1917	–
Wrentham School,	Dr. Mildred A. Libby,	Aug. 20, 1916	–
Bridgewater,	Dr. George H. Crofton,	–	Jan. 1, 1917
	Dr. George A. Gaunt,	Feb. 5, 1917	–

Note.

Attention is called to the fact that through error the name of Dr. L. Vernon Briggs was omitted in the statement of authorship of Contribution No. 106 (1915.9). This contribution, entitled "A Note on Recent Extension of Out-patient Work in Massachusetts Hospitals for the Insane," was published both in the "American Journal of Insanity" and in the "Boston Medical and Surgical Journal," and in the latter publication Dr. Briggs' name was inadvertently omitted.